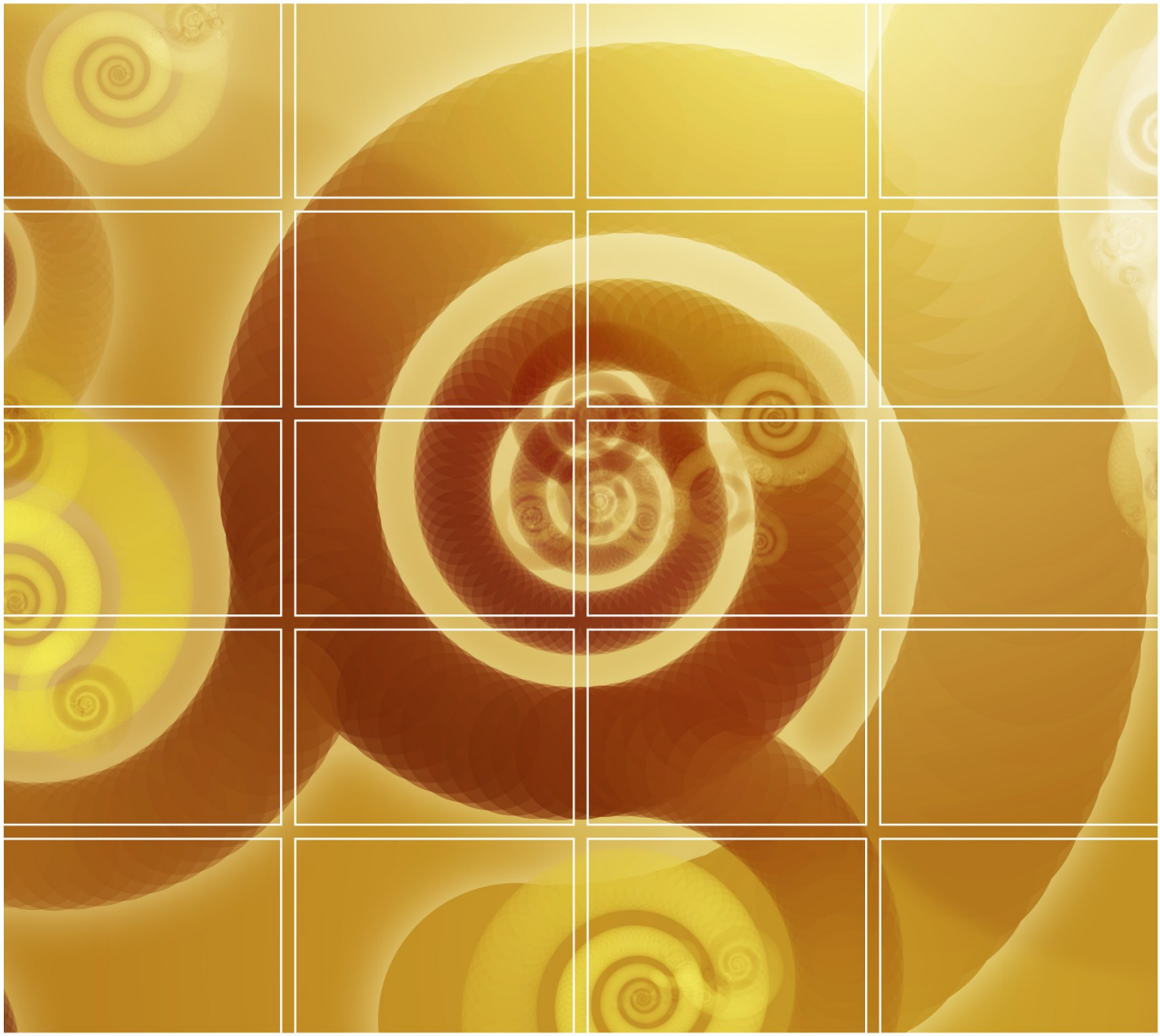

Ammonium Nitrate Storage and Distribution Facility

Response to Submissions Report

Crawfords Freightlines

April 2013

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Prepared by:	*Claire Burnes*
Position	*Environmental Engineer*
Signed:	
Date:	*9 April 2013*
Approved by:	*Steve O'Connor*
Position:	Partner
Signed:	
Date:	*9 April 2013*

Environmental Resources Management Australia Pty Ltd Quality System

Quality-ISO-9001-PMS302

FINAL REPORT

Crawfords Freightlines Pty Ltd

Ammonium Nitrate Storage and Distribution Facility

Response to Submissions Report and Revised Statement of Commitments

April 2013

Reference: 0143175

Environmental Resources Management Australia
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ANNEXES

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1 PROJECT OVERVIEW

1.1 BACKGROUND AND PROPOSAL

Crawfords Freightlines Pty Ltd (Crawfords) is seeking approval to store and distribute 13 500 tonnes (t) of bagged Ammonium Nitrate (AN) from existing warehouses at its Sandgate facility, located at Lot 12 DP 625053, Old Maitland Road, Sandgate. Packaging operations involve decanting flexible Intermediate Bulk Containers (IBCs) of AN into bulk tipping trailers or bulk shipping containers.

The site is currently owned by Sierra Sun Pty Ltd, with portions of the site leased to Crawfords for their storage and distribution operations; a permitted land use within the current "IN3 Heavy Industrial" zoning under the Newcastle City Council (NCC) Local Environmental Plan (LEP) 2012.

The proposal is classified as 'State Significant Development (SSD)' by the Minister under Part 4, Division 4.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This required the preparation of an Environmental Impact Statement (EIS) under Schedule 2 of the EP&A Regulations. Division 4.1, clause 89C (2), details that *"A State Environmental Planning Policy (SEPP) may declare any development, or any class or description of development, to be State significant development."* Clause 8(1b) of the SEPP - State and Regional Development 2011 (SEPP S&RD) declares development to be SSD if the development is specified in Schedule 1 or 2. Clause 10(3) of Schedule 1 states:

> *"Development for the purpose of the manufacture, storage or use of dangerous goods in such quantities that constitute the development as a major hazard facility within the meaning of Chapter 6B of the Occupational Health and Safety Regulation 2001"(*OH&S Regulations). Ammonium Nitrate is classified as a Class 5 dangerous good.

The definitions listed in Chapter 6B of the OH&S Regulations states that a Major Hazard Facility (MHF) is "*a facility at which Schedule 8 materials are present or likely to be present in a quantity that exceeds their threshold quantity.*" Schedule 8 lists Ammonium Nitrate with a threshold quantity of 2500 t. The proposal is to store and distribute 13 500 t of AN. Therefore the operation is defined as a MHF, which is considered to be SSD.

1.2 PUBLIC EXHIBITION OF EIS AND SUBMISSIONS

The EIS was publically exhibited between 6 February 2013 and 11 March 2013 at the following locations:

- Department Planning and Infrastructure (DP&I), Head Office Information Centre, Bridge Street, Sydney;

- DP&I, Newcastle Regional Office, Price Waterhouse Coopers Centre, Honeysuckle Drive, Newcastle;
- Newcastle City Council (NCC) Administration Centre, King Street, Newcastle; and
- Nature Conservation Council, Wilson Street, Newtown.

A copy of the EIS was also available to the public on the DP&I website throughout the exhibition period.

This "Response to Submissions" Report (RTS) has been prepared in response to issues raised during the public exhibition period of the EIS. It will be submitted to the DP&I so that the Development Application lodged by Crawfords Freightlines can be further assessed and determined.

1.3 SUBMISSIONS SUMMARY

Twenty-seven (27) submissions from agencies, organisations and the public were received including:

- 12 agency submissions; and
- 15 community submissions.

1.4 RESPONDENT DETAILS

A total of 27 responses were received during the public exhibition period from the agencies/organisations and individuals identified in *Table 1.1*.

Table 1.1 Respondent Details

Respondent ID	Respondent Name
Agency Stakeholders	
1	NSW Department of Planning and Infrastructure (DP&I)
2, 3	NSW Department of Primary Industries (DPI) - NSW Office of Water (NOW)
4	NSW Department of Primary Industries (DPI) – Fisheries NSW
5	NSW Department of Trade and Investment, Regional Infrastructure and Resources (DTIRIS) – Mineral Resources Branch (MRB)
6	Office of Environment and Heritage (OEH)
7	NSW Environment Protection Authority (EPA)
8	NSW Roads and Maritime Services (RMS)
9	NSW Workcover
10	Newcastle City Council (NCC)
11	Hunter Water Corporation (HWC)
12	Australian Rail Track Corporation (ARTC)
Public/Community Stakeholders	
20	St Joseph's Retirement Village Committee petition
15	Cliff Gale (Downer EDI)
16	Christina Clegg

Respondent ID	Respondent Name
18	David Horkan
14	Michelle Misfud
13	Tanika Ridgeway
22	Tony Richards
24	John L. Hayes
23	John Sutton
19	Neill Wiseman (Yara Australia)
26	Rick Banyard
27	Colin Keith
17	Anonymous submission 1
21	Anonymous submission 2
25	Community petition

1.5 REPORT STRUCTURE

Chapter 2 provides a summary of the key issues raised in the submissions and other matters that required more consideration for proposal justification and response. These matters include:

- hazards and risks,
- flooding and impacts on downstream natural systems,
- stormwater management and
- contamination risk management.

Responses to all submissions received during the public exhibition process are provided in *Annex A*.

2 RESPONSE TO SUBMISSIONS

2.1 INTRODUCTION

Following the public exhibition of the EIS and receipt of agency and public submissions, the project described in the EIS has not been modified, however to specifically address agency and community concerns, additional management processes and systems will be implemented as discussed below, and in the response to submissions in *Annex A*.

A number of the 27 responses received identified similar issues. Four key issues have been identified. These issues are summarised and discussed in *Sections 2.2*, *2.3*, *2.4* and *2.5.*

Section 2.6 provides further details on the noise modelling scenarios as requested by the DP&I.

2.2 HAZARD ANALYSIS

2.2.1 *Public Safety / Human Health Risks*

Public safety and human health risks were a key area of concern in at least 13 of the submissions. These concerns focused on proximity of the site to residences, proximity to the St Joseph's Home, land use conflicts and the appropriateness of the site, public safety risks associated with transportation of product, as well as traffic volumes.

The Hazard Analysis conducted by Health & Safety Essentials calculated societal risk based on the consequence and frequency analysis using the methodology required by DP&I. Consequences and impacts were determined for a range of accident scenarios. The Societal Risk graph (see *Figure 4.5* of the EIS) shows that the calculated Societal Risk lies within the 'As Low As Reasonably Practicable' (ALARP) region of the figure. Within the ALARP region, the emphasis is on reducing risks as far as possible towards being negligible. Provided all other qualitative and quantitative criteria are met, Societal Risk is considered to be tolerable if within the ALARP region.

One specific matter of public safety relates to limiting public access to the area affected by the risk contours identified as the proposed buffer/community exclusion zone shown on *Figure 1* of this RTS report. The Proponent is continuing to progress actions to restrict public access to the buffer area including the area of 'open space' within the risk contour located to the west of the Main Northern Railway corridor (see *Annex A*). The land comprises two parcels of land, which are both owned by Newcastle City Council (NCC). Part of one of these parcels is located within the Golf Driving Range lease area and the balance of the buffer area is outside this lease area.

Estimated Points:

A (378437.94, 6362538.74)
B (378378.03, 6362691.09)
C (378285.94, 6362655.37)
D (378260.84, 6362684.71)
E (378254.25, 6362719.22)
F (378255.39, 6362799.08)
G (378266.17, 6362841.87)
H (378259.31, 6362860.04)
I (378299.53, 6362898.35)
J (378422.16, 6362552.79)
K (378344.27, 6362620.38)
L (378311.67, 6362624.34)
M (378296.02, 6362629.98)
N (378290.90, 6362647.36)
O (378246.25, 6362894.87)
P (378234.83, 6362946.93)
Q (378246.25, 6362894.87)
R (378236.79, 6362980.79)
S (378263.02, 6363001.55)

Coordinates of estimated points: GDA 1994 MGA Zone 56

S
R
Q
P
O
H
G
F
E
D
C
N
M
L
K
J
A
I
B

Lot 31
DP 1118637

Lot 16
DP 1148792

Lot 32
DP 1118637

Lot 33
DP 1118637

Legend

- Crawfords Site
- Golf Practice Centre Lease Area. Approximate Land Area = 8.32 ha
- $10x10^{-6}$ Individual Fatality Risk Contour
- Operational Land subject to licence with CMA. Approximate Land Area = 0.74 ha
- Operational Land. Approximate Land Area = 2.64 ha
- Operational Land within Golf Practice Centre Lease Area. Approximate Land Area =1.10 ha

Notes:
All data is approximate only and should not be relied upon for accuracy.

N
0 50 100 150m

Source:
Imagery: (c) 2010 Microsoft Corporation and its data suppliers.

Client:	Crawfords Freightlines Pty Ltd		
Drawing No:	0143175s_RtS_G001_R0.mxd		
Date:	05/04/2013	Drawing Size:	A3
Drawn By:	GC	Reviewed By:	NB

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Figure 1 - Crawfords AN Storage Facility Sandgate Proposed Buffer/Community Exclusion Zone
Crawford Freightlines Pty Ltd - Response to Submissions

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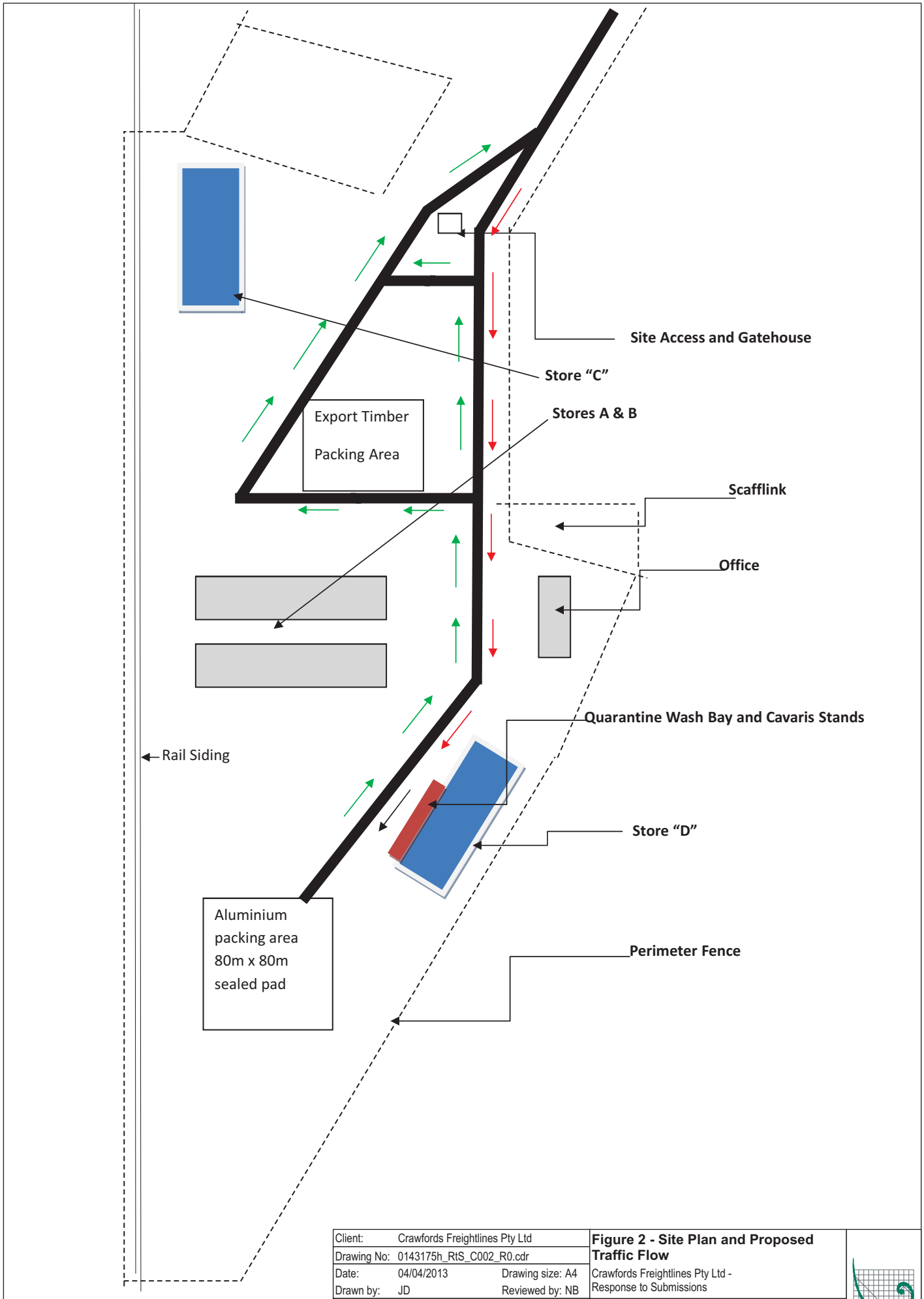
Crawfords have been involved in negotiations with the leaseholder of the practice golf range at Sandgate, and these negotiations are at an advanced stage and are likely to result in a satisfactory outcome, being Crawford's exclusive right to control land use within the buffer area. Crawford have advised that they have reached agreement with the leaseholder in respect to securing the right to control land use in this part of the lease area. This agreement is in the process of being documented and will be forwarded to DP&I when it is in a form acceptable to both parties.

Negotiations with NCC have also been progressing well in respect to the balance of the land within the buffer area (over land owned by Council). ERM understands that Council's solicitor has been instructed to prepare the necessary documentation for review by Crawford's solicitor from Rankin and Nathan. Once again, when in a form acceptable to both parties, it will be forwarded to DP&I.

Traffic risks on the access road from Old Maitland Road and in particular potential conflict and/or access issues to St Joseph's Sandgate (retirement village and high care services) was identified in a number of the submissions. The authorities have reviewed the Traffic Impact Assessment provided in the EIS and their responses are provided in *Annex A*. Specifically, NSW Roads and Maritime Services has no objections to or requirements for the subject development as the development will have no significant impact on the classified (State) road network or the operation of traffic control signals. RMS referred to NCC for any requirements for Old Maitland Road but NCC has not provided any requirements specific to this road.

In response to a request from the DP&I, Crawford's have identified traffic flow routes within the site for laden and unladen heavy vehicles (see *Figure 2* of this RTS report) providing for forward movement of vehicles to minimise delays on site and also separation of laden and unladen heavy vehicles for some of the internal roads. These site specific measures in combination with the reduced (20 km/hour) speed limit on the service road and the adequate sight distances both ways (100 m) at the intersection with Old Maitland Road, will serve to minimise the risk of a queue forming on the access road to the site and reduce the risk of accidents.



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Not To Scale

Source:
Crawfords Freightlines Pty Ltd

Client:	Crawfords Freightlines Pty Ltd		
Drawing No:	0143175h_RtS_C002_R0.cdr		
Date:	04/04/2013	Drawing size:	A4
Drawn by:	JD	Reviewed by:	NB

This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

Figure 2 - Site Plan and Proposed Traffic Flow

Crawfords Freightlines Pty Ltd - Response to Submissions

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2.2.2 *Explosion / Detonation Risks*

The majority of the concerns raised on public safety and human health risk focused on the risk of explosion/detonation.

The detonation risk posed by the ammonium nitrate stored at the site has been considered in the Hazard Analysis. *Australian Standard 4326 Storage and Handling of Oxidizing Agents* and ammonium nitrate storage licensing requirements of NSW WorkCover allow for the storage of up to 500 t of ammonium nitrate in a stack, with stacks separated by three metres. Alternative views on stack separation have been presented in *Section 4.2* (Safe storage of ammonium nitrate, Australian Standards and Codes of Practice) and *Section 4.3* (Safe storage of ammonium nitrate, International Standards and Codes of Practice) of the Hazard Analysis (Annex B of the EIS). Uncertainty regarding the appropriateness of the separation distances specified by SAFEX International arises from a review of the publicly available research papers on which these separation distances are based, and the lack of acceptance of the SAFEX guidance by regulators (Western Australia is the only jurisdiction world-wide who appear to have adopted the SAFEX separation distances).

The methodology adopted for the Hazard Analysis considered potential incidents involving up to 2500 tonne of ammonium nitrate. This was the methodology required and accepted by the DP&I and is in accordance with the methodology also presented in SAFEX.

The facility will be regulated as a Major Hazard Facility (MHF) by NSW WorkCover and the storage of ammonium nitrate will be licensed by NSW WorkCover. It is Crawford's understanding that the proposed storage arrangements meet current ammonium nitrate licensing requirements. As a MHF, Crawfords will be required to submit a Safety Report (also known as a Safety Case) which demonstrates that risk has been reduced so far as is reasonably practicable. Crawford's is working with NSW WorkCover to ensure that ammonium nitrate licensing and MHF requirements are met.

2.2.3 *Environmental Risks*

A number of submissions raised environmental risks specifically to the wetland habitats in the immediate environs and specifically the Hunter River Ramsar wetland (see *Section 2.3.2*). The major environmental concern associated with the storage and handling of AN relates to increased nitrogen concentration in waters. This may occur should spills of AN be washed into nearby receiving waters during rain events. Excessive levels of nitrogen may kill vegetation and excessive growth of algae in waterways can lead to eutrophication, resulting in decreased oxygen and death of aquatic fauna.

Analysis of risk to biophysical environment was provided: in Section 13 of the Hazard Analysis in Annex B of the EIS; in the water quality modelling in Annex E; and the ecology assessment in Annex F of the EIS.

The Hazard Analysis (Annex B of the EIS) concluded that the proposal met the following criteria for the biophysical environment set by the Department of Planning (2011) in *Hazardous Industry Planning Advisory Paper No. 4 Risk Criteria for Land Use Planning*:

- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the effects (consequences) of the more likely accidental emissions may threaten the long-term viability of the ecosystem or any species within it; and

- Industrial developments should not be sited in proximity to sensitive natural environmental areas where the likelihood (probability) of impacts that may threaten the long-term viability of the ecosystem or any species within it is not substantially lower than the background level of threat to the ecosystem.

Modelling undertaken by BMT WBM in Annex E investigated potential water quality effects in the receiving environment potentially resulting from the release of AN under flood conditions. Under each scenario, AN release from Sheds A, B and C would result in ammonia concentrations in the local area in excess of the relevant toxicity trigger value provided by the ANZECC (2000) guidelines. Crawfords have proposed a number of measures in the EIS to improve the flood proofing of the storage sheds. Since submission of the EIS these measures have been reviewed as discussed in the following *Section 2.3.1*. The intent of these measures is to reduce potential for ingress of floodwaters to the buildings and accordingly reduce risk of occurrence of the scenarios as modelled by BMT WBM.

2.3 FLOODING AND IMPACTS ON DOWNSTREAM NATURAL SYSTEMS

2.3.1 *Effectiveness of Proposed Flood Proofing*

The DP&I specifically identified that:

"Section 4.4.3 (p. 95) of the EIS details the proposed 2% AEP and 1% flood event mitigation measures to prevent contamination from the release of AN into the local environment during a flood event.

However, is not clear to the Department if these measures would be effective in preventing the release of AN in to the local environment during a flood event?"

The Department requests that a detailed discussion is provided on the objectives of and expected effectiveness of these measures. It needs to be demonstrated that such mitigation measures would be effective in protecting the local environment from the release of AN during a flood event and associated contamination."

Following further investigation, it is no longer proposed to undertake treatment of existing timber panelling on the inside and outside of Sheds A and B with reinforced concrete as a flood proofing measure due to structural

limitations of such a treatment. An alternative permanent flood proofing solution has been identified for these sheds, which incorporates the application of an impervious sealant to the shed walls that protects against ingress of water in a 1% AEP event level plus 500 mm freeboard. Flood proofing treatment for Shed C will consist of 100 mm thick 25 mpa cast concrete panels fitted between and secured to the building columns. Joints will be sealed using the impervious sealant product that is to be used to seal the timber panels of Sheds A and B.

Further, subsequent to preparation of the EIS, it has been identified that cracking/expansion joints within the floors of Storage Sheds A and B may be a potential pathway for transfer of AN to surface and groundwaters. As such, in addition to the stormwater management measures outlined in the EIS, Crawford's is also committed to implementing building modifications within Storage Sheds A and B that incorporates the sealing of the concrete floor expansion joints/voids with impervious epoxy resin to reduce the potential surface/groundwater product exposure pathway.

The Proponent has engaged a certified structural engineer to provide certification of Storage Sheds A, B and C to withstand the 1% AEP design flood event plus 500 mm freeboard depth. A copy of the structural certification documentation will be forwarded to DP&I.

2.3.2 Risk of Impact on Natural Systems

Modelling undertaken by BMT WBM of two scenarios identified the likely routes and ultimate fate of ammonia potentially released from three storage sheds on the site during flood events.

With respect to flooding potential, it should be noted that the site is located in a backwater area of Ironbark Creek floodplain. During large floods, flow velocities are very low and flood levels across large areas of Hexham Swamp and the Ironbark Creek catchment are similar. Whilst flow velocities are low at the site during large floods, the modelling results suggest there is a slight flow gradient from west to east across the site that would direct slow moving floodwaters towards the 2HD Swamp prior to draining to the north towards Ironbark Creek.

During more frequent smaller rainfall events, the existing site levels and drainage systems control the direction that stormwater is discharged from the site. The east draining parts of the site flow to the 2HD Swamp, and the west draining parts flow to the railway corridor open drain that, in turn, discharges to the same drainage line as 2HD Swamp.

The ecology assessment in Annex F of the EIS describes 2HD swamp and wetlands in the immediate environs. 2HD Swamp is dominated by *Panicum repens* wet grassland with *Typha/Phragmites* reed swamp fringing the northern edge of 2HD Swamp and dominating drainage line to the north of the site.

Exotic shrubs and grasses fringe the site and 2HD Swamp (see Figure 5.4 in Annex F).

The area to the north, west and southwest of the site are characterised by freshwater wetlands and estuarine communities. These communities/wetlands include the: Swamp Oak forest associated with Ironbark Creek to the west of the Main Northern Railway and to the north of the site; Shortland Wetlands Reserve approximately 500m to the southwest of the site; the freshwater wetlands of Market Swamp and Newcastle Wetlands Reserve approximately 500m to the south of the site; and 'Hexham Swamp' within the Hunter Wetlands National Park to the north of Ironbark Creek.

Of significance is the international recognition of the Hunter Estuary Wetlands Ramsar site. The impact on the Ramsar site and the wetlands in the immediate environs were raised in a number of submissions.

The Hunter Estuary Wetlands Ramsar site comprises two 'nodes' being the Shortland Wetlands Centre (now called Wetlands Centre Australia) and the Kooragang Wetlands (previously known as Kooragang Island Nature Reserve) that also form part of the Hunter Wetlands National Park. The Shortland Wetlands Centre is approximately 500 m to the southwest of the site (west of the Sandgate bypass currently under construction) and upstream of the site. The Kooragang Wetlands are associated with the north arm of the Hunter River and are bounded in the south by the Kooragang Island Branch Line (railway). The Kooragang Wetlands do not include the bed of the southern channel of the Hunter River, into which Ironbark Creek drains.

The proposed continuation of existing operations will not affect directly any of these wetland areas or on either of the Hunter Estuary Wetlands Ramsar site.

There is potential for indirect impacts on 2HD Swamp and wetlands downstream of the site (to the east of the Main Northern Railway) associated with dispersal of surface flows potentially derived from Crawford's site in particular during flooding and runoff events. Flood risks are described above. It is important to note that improvements in management of stormwater are predicted to improve water quality, including retaining and filtering stormwater runoff to reduce the concentrations and loads of pollutants discharging in stormwater from the site as further described below.

2.4 STORMWATER MANAGEMENT

2.4.1 Stormwater Management Measures

It is noted in Section 2.5.2 of Annex E of the EIS that:

"No additional development is proposed that would result in surface runoff from the Site being increased above existing conditions. Although no additional surface runoff will be generated by the development, the

development provides an opportunity to improve the way that stormwater is currently drained within the Site."

As detailed in Section 5.3.3 of the EIS (Vol I), the primary stormwater management measures proposed for the site would significantly improve stormwater quality when compared to the existing conditions on-site, and that provision of a secondary series of source controls and soft measures including housekeeping, surface regrading, surface protection, improved drainage and a wheel wash bay would further substantially reduce the potential for exposure of pollutants to stormwater.

Subsequent to exhibition of the EIS, it has been identified that cracking/expansion joints within the floors of Storage Sheds A & B may be a potential pathway for transfer of AN to surface and groundwaters. As such, in addition to the stormwater management measures outlined in the EIS, the Proponent commits to implementing building modifications within Storage Sheds A and B to seal the concrete floor expansion joints/voids with impervious epoxy resin to reduce the potential surface/groundwater product exposure pathway.

2.4.2 Surface Water Quality Monitoring

BMT WBM (2012) in Annex E of the EIS has described surface drainage flows. Surface water flows ultimately meet Ironbark Creek via drainage lines to the north of the site and to the east of the rail corridor. The Main Northern Railway corridor acts as a levee for surface water flows. Surface flows in the western catchment of the site (see Figure 2-5 of Annex E) are directed towards an open channel in the rail corridor, which redirects surface drainage to the drainage line to the north of the development site. Surface flows in the east of the site drain into 2HD swamp then to the north, north east of the site towards Ironbark Creek.

Based on the local surface water flows contaminated surface flows are largely directed towards 2HD swamp to the east of the site. Water quality analysis of 2HD swamp was undertaken as part of the ecological investigations for the proposal (see Annex F of the EIS). Concerns were raised that: data represented only a 'snap shot' of the water quality; also to the rigour of the design of the (past) sampling.

2HD Swamp and the nearby reference site (Site 1), to the west of the rail corridor, have a history of modification and inflows from a variety of adjoining land uses (including rail and landfill) and history of the site itself where similar products (ie fertilizers) have been stored since 2000. Therefore, establishment of a natural, undisturbed baseline condition and/or local control sites within similar environment was problematic.

The 'snapshot' results presented in the Ecology Assessment for surface water ammonia concentrations are similar to, so validated by, the median results for 2HD Swamp from sampling undertaken between 2008 until the end of 2011

within the Hexham Swamp and Ironbark Creek area as reported by Hunter Central Rivers Catchment Management Authority (HCRCMA) (2012). (These results are reported in Section 2.4.5.2, Section 2.4.5.3 and Figure 2.4 of Annex E of the EIS). Specifically, total uncombined ammonia recorded by ERM in 2HD Swamp ranged from 30 to 120µg/L, while the average HCRCMA results were 120µg/L.

The HCRCMA results for 2HD swamp were slightly lower than those reported within Ironbark Creek at King Street Shortland (150µg/L) and similar to the median results at the floodgates on Ironbark Creek (130µg/L). With these ammonia concentrations shown to be present regionally, 'obvious' algal content (enriched chlorophyll-a levels) would typically be expected and the presence of algae was also shown at physiographically-similar sites (unflushed freshwater sites) in the available set of monitoring sites. Therefore the evidence is that water quality at wetlands close to the proposed AN facility is not different to that of surface waters in other southern parts of the Shortland wetland complex.

Importantly the proposed measures for stormwater management and site based management of the proposed development, as identified in the EIS, have been modelled to show that that the proposed structures will meet the NCC stormwater pollutant load reduction targets of a 65% reduction in Total Phosphorus and 45% reduction in Total Nitrogen, as reported by BMT WBM in Table 2-14 of Annex E.

A surface water monitoring program will be developed for an approved AN facility for surface water quality and ecosystem health monitoring and reporting. Areas of interest would be the aquatic receiving environments to the east of the site. The program will assess ammonia and nitrogen concentrations and examine effects of improvement on the management of ammonium nitrate potentially emitted from the site. The surface water monitoring programme will assess, as a minimum, in-situ water quality measurements (temperature, salinity, dissolved oxygen, turbidity, pH and oxidation-reduction potential) with laboratory analysis on a suite of bioavailable nutrients and chlorophyll-a levels. This will be combined with monitoring of the effectiveness of the stormwater management structures and assess the need for any improvements.

2.5 RISK OF CONTAMINATION

The site is located in an area of historical industrial land use with a number of current and historical potentially contaminating processes both on and off site.

Contamination sources are generally associated with the storage of AN, historic storage and handling of hydrocarbon based fuels, historic storage and handling of general fertiliser and possible impacts related to historic land filling processes (Annex D of the EIS). Certain elevated concentrations of ammonia in the groundwater are significant and warrant notification of the

site under Section 60 of the *Contaminated Land Management Act 1997*. Crawfords will work with the land owner to provide the required notification of the Site under the Act.

In addition to the measures proposed in the EIS to improve handling, storage and management of the site, it has been identified that cracking/expansion joints within the floors of Storage Sheds A and B may be a potential pathway for transfer of AN to groundwater.

As such, in addition to the stormwater management measures outlined in the EIS, Crawford's is also committed to implementing building modifications within Storage Sheds A and B that incorporates the sealing of the concrete floor expansion joints/voids with impervious epoxy resin to eliminate this potential groundwater product exposure pathway.

A Groundwater Management Plan will be prepared to assess the effectiveness of improvements of management of AN. The plan will identify appropriate sampling techniques, locations and provide baseline data. A ground water monitoring programme is proposed for adoption at the site to assess ammonia and nitrogen concentrations and the measurable effects of improvement on the management of ammonium nitrate on the site. Groundwater monitoring parameters would include as a minimum Ammonia , Total Oxidised Nitrogen, pH, and select dissolved elements.

2.6 NOISE ASSESSMENT

The DP&I in their submission identified that:

> *"Minimal detail has been provided on each of the operational noise scenarios. The operational noise assessment should present a worst-case scenario. It is unclear to the Department why the worst-case scenario would not be 'rail, trucks and conveyor use combined? It is unclear how each of the operational scenarios assessed interact. Are there on-site management practices which restrict the use of conveyors and rail at the same time? Such practices, should they exist, should be detailed as revised noise mitigation measures in the RTS. The Department requests that clarification on the above be provided in the RTS."*

In consultation with Crawford's and based on the information available at the time the assessment was completed, ERM developed four operational noise assessment scenarios which were adopted to predict noise levels at each of the sensitive receptor locations (R1 to R9 as described in Annex I of the EIS). These scenarios were developed to reflect actual operation which occurs on site, to determine compliance with the Industrial Noise Policy (INP) and to identify potential impacts associated with a range of unmitigated onsite activities. All scenarios were assessed under calm and adverse meteorological conditions.

Worst-case noise emissions are varied (due to the location of noise sources) between the nine assessed receptors (R1 to R9) but in all cases were associated

with either the third scenario (Rail and Trucks Combined) or fourth scenario (Trucks (and conveyor use)) during adverse meteorological conditions. The scenario proposed by DP&I does not occur onsite as conveyor usage is not required during combined truck and rail loading activities. This is not associated with on site management practices but is symptomatic of equipment usage dependant on product delivery.

Regardless, ERM considers it prudent to consider this fifth hypothetical scenario to efficiently respond to DP&I.

Unmitigated noise levels for scenario five (Rail, Trucks and Conveyor Combined) have been predicted for receptors R1 to R9 in *Table 2.1*.

Table 2.1 Unmitigated Noise Levels for Combined Rail, Trucks and Conveyor Scenario

Receptor	Calculated Noise Level	Daytime PSNL	Evening PSNL	Morning Shoulder Period PSNL	Daytime Compliance	Evening Compliance	Morning Shoulder Compliance
R1	31.4	39	39	39	-7.6	-7.6	-7.6
R2	50.5	55	55	55	-4.5	-4.5	-4.5
R3	41.4	42	42	42	-0.6	-0.6	-0.6
R4	34.2	42	42	42	-7.8	-7.8	-7.8
R5	34.1	42	42	42	-7.9	-7.9	-7.9
R6	45.4	60	57	54	-14.6	-11.6	-8.6
R7	47.1	60	57	54	-12.9	-9.9	-6.9
R8	43.1	43	40	39	**0.1**	**3.1**	**4.1**
R9	50.6	70	70	70	-19.4	-19.4	-19.4

1. dB re: 2 x 10^{-5} Pa and Leq, 15 minute or Leq, period where applicable; and
2. exceedances to PSNL in **bold** typeset.

These results identify that operational noise levels are calculated to remain below the daytime, evening and morning shoulder Project Specific Noise Levels (PSNL) at the majority of receivers. Any exceedances of the PSNL are limited to R8, as per the ERM noise impact assessment and EIS. The magnitude of these exceedances is the same as previously predicted in the ERM noise impact assessment and EIS.

Based on this ERM considers the recommendations for noise management measures during the evening and morning shoulder period and operational noise monitoring (presented in *Section 7* of the noise impact assessment) to be appropriate. Following the successful implementation of the recommended measures, and operational noise monitoring undertaken to evaluate their effect, the potential risk of noise impacts will remain limited and the magnitude of any impacts will become insignificant.

Annex A

Response to Submissions

Table A.1 Response to Submissions

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
Agency Submissions				
Department of Planning and Infrastructure (DP&I)	1.01	**Hazards and Risk**	The Environmental Impacts Statement (EIS) and Preliminary Hazards Analysis (PHA) for the proposed development show that the contour for active open space (10 per million per year) extends approximately 250 metres (m) beyond the western boundary of the site. The Department understands that part of this land is leased by the City of Newcastle Council to a private entity for the purpose of a Golf Driving Range and as such it should be considered as open space land use. The Department requests that you outline in the Response to Submissions Report (RTS) what measures would be undertaken and maintained by Proponent to ensure that public access would be restricted to this land for the life of the development. Supporting documentation demonstrating the above and that Proponent have control over the land shall also be provided to the Department.	The Proponent is progressing actions to ensure that access is restricted to the area of land that lies within the risk contour located to the west of the Main Northern Railway corridor that is considered open space land use (refer *Figure 1* in the RTS report). The land in question comprises two parcels of land that lie within the buffer area, which are both owned by Newcastle City Council. Part of one of these parcels is located within the practice Golf Range lease area and the balance of the buffer area is outside this lease area. Crawfords have been involved in negotiations with the leaseholder of the Golf Driving Range at Sandgate, and these negotiations are at an advanced stage and are likely to result in a satisfactory outcome, being Crawfords exclusive right to control land use within the buffer area. Crawfords have advised that they have reached agreement with the leaseholder in respect to securing the right to control land use in this part of the lease area. This agreement is in the process of being documented and will be forwarded to DP&I when it is in a form acceptable to both parties. Negotiations with NCC have also been progressing well in respect to the balance of the land within the buffer area (over land owned by Council). We understand that Council's solicitor has been instructed to prepare the necessary documentation for review by Crawford's solicitor from Rankin and Nathan. Once again, when this documentation is in a form acceptable to both parties it will be forwarded to DP&I for review.
DP&I	1.02		The EIS/PHA indicated that the route/s followed by the laden and unladen trucks to and from the facility would be via a single entry point, north of the facility. Please provide more detailed	Recent modifications to the entry and access road configuration within the site have incorporated the separation of inbound and outbound traffic flows at the site entry/gatehouse (refer to *Figure 2* in

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			information in the RTS on the route/s taken by the laden and unladen trucks including a clearly marked up map. The Department also wishes to clarify in the RTS what steps have been taken to reduce the likelihood of an accident at the gate of the facility? In addition, what are the risk implications to the surroundings (eg a truck accident at the gate may cause an impact to St Joseph's)?	the RTS report). The sign posted speed limit along the access road to the site is 20km/hr, therefore reducing the potential for any traffic incidents along the access road or at the gatehouse entry to the site. The Traffic Impact Assessment considered the intersection of the site access road and Old Maitland Road. Based on the indicative speed limit of 50km/hour the required visibility for the intersection is 69m. The existing intersection visibility exceeds 100m in both directions. Section 3.2.1 of the Traffic Impact Assessment states that there is currently sufficient capacity to accommodate the light and heavy vehicle trips generated by the proposal and other nearby industrial developments and that no queues form on the service road during peak activity. In summary, reduced speed limit on the service road, the adequate sight distances at the intersection with Old Maitland Road, the definition of traffic flows within the site (as shown on *Figure 2* of the RTS report) will facilitate forward movement of heavy vehicles and traffic flow on site, and serve to further minimise the risk of a queue forming on the site access road and reduce the risk of a road accident.
DP&I	1.03		Ammonium Nitrate (AN) is received in flexible bags in shipping containers by rail from the Port of Sydney, with a maximum shipment of 400 tonnes. This transfer activity appears to be absent from both the hazard identification and consequence analysis in the EIS/PHA. The Department requests that you clarify in the RTS what the implications of this scenario would be on the risk contour west of the facility?	As stated in the Hazard Analysis, the current practice, which is proposed to be continued, is to immediately remove shipping containers and unload them into storage so that that empty shipping containers can be returned as quickly as possible. Standard loading/unloading time is one working day; and trains are present 2-4 times per week. Even using a worst case scenario, the largest quantity that could be involved in an explosion is 400 tonne (maximum train capacity), whereas the incidents that influence the location of the existing risk contours west of the facility would relate to storage incidents involving up to 2,500 tonnes of ammonium nitrate. The frequency of any train incident would be significantly less than any storage

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				incident due to intermittent nature of the train operations (trains present only 10-20% of the time). It is therefore not expected that an incident involving the transfer of shipping containers from the rail line would alter the risk contours to the west of the facility.
DP&I	1.04	**Flood Management**	Section 4.4.3 (p. 95) of the EIS details the proposed 2% AEP and 1% flood event mitigation measures to prevent contamination from the release of AN into the local environment during a flood event. However, is not clear to the Department if these measures would be effective in preventing the release of AN in to the local environment during a flood event?	Following further investigation, it is no longer proposed to undertake treatment of existing timber panelling on the inside and outside of Sheds A and B with reinforced concrete as a flood proofing measure due to structural limitations of such a treatment. An alternative permanent flood proofing solution has been identified, which incorporates the application of an impervious sealant to the shed walls that will protect against ingress of flood water in a 1% AEP event plus 500mm freeboard. Further, subsequent to preparation of the EIS, it has been identified that cracking/expansion joints within the floors of Storage Sheds A and B may be a potential pathway for transfer of AN to surface and groundwaters. As such, in addition to the stormwater management measures outlined in the EIS, Crawfords commits to implementing building modifications within Storage Sheds A and B that incorporates the sealing of the concrete floor expansion joints/voids with impervious epoxy resin to eliminate this potential surface/groundwater product exposure pathway.

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				The revised set of mitigation measures (compared to that proposed in the EIS) strengthens flood proofing measures to the point where negligible release of AN during a major flood effect is likely.
DP&I	1.05		The Department requests that a detailed discussion is provided in the RTS on the objectives of and expected effectiveness of these measures. It needs to be demonstrated that such mitigation measures would be effective in protecting the local environment from the release of AN during a flood event and associated contamination.	As above.
DP&I	1.06		As noted in the submissions from Department of Primary Industries, the Office of Environment and Heritage and the City of Newcastle Council, AN can be highly toxic to a range of organisms. The Department considers that all structures proposed to store AN should be structurally certified by an engineer to withstand up to a 1% AEP design flood event. Additional and/or alternate flood mitigation measures may also be proposed in the RTS.	The Proponent has engaged a certified structural engineer to provide certification of storage sheds A and B to withstand the 1% AEP design flood event plus 500mm freeboard above the flood height. A copy of the structural certification documentation will be forwarded to DP&I.
DP&I	1.07	**Noise and Vibration**	No construction noise mitigation or management measures have been detailed in the EIS to address expected exceedances of the relevant noise management level/s. The Department considers that additional construction noise mitigation and/or management measures(eg a Construction Noise Management Plan or community consultation) should be considered and detailed in the RTS to reduce construction noise impacts on nearby sensitive receivers. Where possible, noise attenuation achieved from the implementation of additional mitigation should be quantified and detailed in the RTS.	As noted in the EIS, the actual requirement for construction works and specific details regarding plant and equipment that may used for this purpose were unknown at the time of reporting and that, as such, it was not practical to provide specific noise control and/or mitigations measures. Construction works will be largely associated with improvements of the stormwater management systems on site. In principle noise control and/or mitigation measures have been provided in the Noise Impact Assessment (Section 7). Crawfords commit to expand on these in a Construction Noise Management Plan.
DP&I	1.08		Minimal detail has been provided on each of the operational noise scenarios. The operational noise assessment should present a worst-case scenario. It is unclear to the Department why the worst-case scenario would not be 'rail, trucks and conveyor use combined? It is	ERM developed four operational noise assessment scenarios which were adopted to predict noise levels at each of the sensitive receptor locations (R1 to R9). These scenarios were developed to reflect actual operation which occurs onsite, to determine compliance with the INP

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			unclear how each of the operational scenarios assessed interact. Are there on-site management practices which restrict the use of conveyors and rail at the same time? Such practices, should they exist, should be detailed as revised noise mitigation measures in the RTS. The Department requests that clarification on the above be provided in the RTS.	and to assist identify potential impacts associated with a range of unmitigated onsite activities. All scenarios were assessed under calm and adverse meteorological conditions. Worst-case noise emissions are varied (due to the location of noise sources) between the nine assessed receptors (R1 to R9) but in all cases were associated with either the third scenario (Rail and Trucks Combined) or fourth scenario (Trucks (and conveyor use)) during adverse meteorological conditions. The scenario proposed by DP&I does not occur onsite as conveyor usage is not required during combined truck and rail loading activities. This is not associated with onsite management practices but is symptomatic of equipment usage dependant on product delivery. Regardless, ERM considers it prudent to consider this fifth hypothetical scenario (see *Section 2.6* of the RTS report).
DP&I	1.09		The Department also wishes to clarify that only 1 train is proposed to enter and exit the site a day as per the 'rail' noise scenario assessed in the EIS?	The PSNL were determined in accordance with the INP and the more stringent of the intrusiveness or amenity criteria adopted. In this case the intrusiveness criteria applied in all cases at all receptors. The criterion assessed was a Leq, 15 minute noise level in dB(A). The ERM noise impact assessment has considered one train generating noise during the 15 minute assessment period, concurrent to all other specified noise sources (refer Table 2.2 - Operational Assessment Scenarios of the Noise Assessment). This represents the worst-case rail noise emission during any 15 minute period and is not intended to represent daily rail movements. Due to the nature of the alignment it is not possible for more than one train to be loaded at the site during any given 15 minute period.
DP&I	1.10	**Contamination**	The Department requires more detailed information in the RTS on the specific measures that are currently in place and would be implemented during operation to prevent further contamination of soil and water at the site (eg sealing and bunding all AN storage	As outlined in DP&I Item #4 response, measures for flood proofing of the structures have been revised. These measures, in particular sealing of the concrete floor expansion joints/voids in Storage Sheds A and B with impervious epoxy resin will reduce potential

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			and handling areas, details of some revised/improved AN handling procedures, triggers for remedial action and/or improvements to the site-wide water management system etc). These measures should be detailed as revised management and mitigation measures for soil and water/contamination in the RTS and in the case of sealing the site and/or AN storage areas, may result in the need for additional assessment of potential impacts (eg on stormwater discharge (ie volume and velocity), flood behaviour or groundwater levels and groundwater dependent ecosystems).	surface/groundwater product exposure pathway. The proponent will prepare a Groundwater Monitoring Plan.
DP&I	1.11	**Traffic Impact**	The EIS states that no assessment of construction traffic was undertaken for the proposal given it involves minimal physical works. The Department requests that the RTS include increased justification for not undertaking a construction traffic assessment. The RTS should include an estimation of the traffic numbers predicted to be generated during construction of the proposed development and a conclusion about the impact of this traffic on the safety and efficiency of the surrounding road network.	As noted in the EIS, the development is currently operational and only minor construction works are proposed. Given the construction works proposed are of a minor nature, consisting of stormwater management system improvements and building modifications of Sheds A, B and C for flood proofing purposes, there will be no significant construction traffic generated at the site.
DP&I	1.12	**Visual Impact**	The Department wishes to clarify what the visual impact of the proposed development on the nearest sensitive receivers would be? For example, would the proposed development (ie building modifications and stormwater treatment devices) be visible from the closest residences and what would be the visual impact of this?	The nearest residences along Pacific Highway are approximately 300m from the site boundary. These residences are slightly elevated above the site and due to the low relief open nature of the landscape, the residents have views over 2HD Swamp of the site, and beyond to the Golf Range (old Astra Street landlfill) or vegetation along Ironbark Creek and Hexham Swamp with distant views of the ranges at Stockrington. The Newcastle Inner City Bypass (Shortland to Sandgate) is currently under construction between these residences and 2HD Swamp. This road will be at grade but the road is expected to detract from the existing views over the site for these residents. Any landscaping associated with the bypass will alter the current view shed. The proposed structural changes to the Storage Sheds will

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				not alter the height or bulk of the existing buildings and will not detract from the areas visual amenity.
DP&I	1.13	**Staging**	It is unclear to the Department from the EIS how long construction works would take (days, months or years)? The Department also requires more detailed discussion of the anticipated staging (including timing) for the proposed development. A staging diagram should be included in the RTS.	Proposed building modification works to Sheds A, B and C, will be completed over a period of weeks, as will installation of the proposed stormwater management measures. The project is not proposed to be staged. All the required works will be undertaken as soon as development consent is granted.
Department of Primary Industries (DPI) – NSW Office of Water (NoW)	2.01	**Impacts on water sources**	NoW is concerned that if AN was released during a flood event which causes the concentration of ammonia to exceed the toxicity trigger value in the ANZECC Guidelines could lead to significant impacts on downstream ecosystems.	Noted in EIS. A range of flooding emergency protocols have been developed to respond to significant flooding events as detailed in *Section 4.4.3* of the EIS (Vol I) to minimise the risks associated with flooding of the site and potential for release of product from the site. In addition to the flooding mitigation measures outlined in the EIS, the Proponent is also committed to implementing additional permanent flood proofing building modifications within Storage Sheds A and B to protect against ingress of flood water in a 1% AEP event plus 500mm freeboard. These building modifications consist of the sealing of concrete floor expansion joints/voids with impervious epoxy resin, and application of impervious sealant to the shed walls.
DPI - NoW	2.02	**Groundwater monitoring**	NoW requests that the proponent make arrangements for the immediate lodgement of an application for a Groundwater Licence under Part 5 of the *Water Act 1912* to authorise the five existing groundwater monitoring bores installed at the site.	An application of a Groundwater Licence under Part 5 of the W*ater Act 1912* for the five existing groundwater monitoring bores has been made and is currently being assessed by NoW.
DPI - NoW	3.01	**Conditions of Approval**	If the proposed project is approved, the Office of Water recommends the following conditions:	-

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	3.02		The Proponent shall prepare and implement a Water Management Plan for the project. This Plan must be developed in consultation with the Office of Water and include: - details of water use and water management on site, - details of water licence requirements, - Surface Water Management Plan, and - Groundwater Management Plan.	Accepted
DPI - NoW	3.03		The Surface Water Management Plan must include: - a program to monitor surface water flows and quality, and ecosystem health immediately downstream of the project, - surface water impact assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts, and - a protocol for the investigation and mitigation of identified exceedences of the surface water impact assessment criteria.	A surface water monitoring program will be developed for monitoring of surface water quality and ecosystem health in the aquatic receiving environments to the east of the site. The program will incorporate bi-annual surface water monitoring at the site to assess ammonia and nitrogen concentrations and the effects of improvement on the management of ammonium nitrate on the site. The surface water monitoring programme will assess as a minimum in-situ water quality measurements (temperature, salinity, dissolved oxygen, turbidity, pH and oxidation-reduction potential) with laboratory analysis reporting on Ammonia, Total Oxidised Nitrogen (nitrite and nitrate), TSS, total phosphorus and chlorophyll-a levels. The program will include baseline water quality sampling from the existing stormwater outlet to confirm typical runoff quality prior to application of proposed stormwater treatment measures and to assist in the development of trigger values/targeted concentrations based on these observed values and review of data for other industrial sites in the local area. Sampling will be undertaken at the three main stormwater outlets /drainage pits near the site boundary and the inlet to Treatment Zone 1 basin. Typical spatio-temporal dimensions would include: - Four sampling events annually at each outlet/drainage pit near the

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				boundary; - Sampling only to occur during rainfall events. Samples to be tested in NATA lab for nitrogen species (NO_x, NH_4, + NH_3, TKN, TN), TP, TSS, heavy metals. Insitu testing for pH, temp, EC, turbidity, DO; - Annual inspection of stormwater management structures to check operational aspects and assess need for any maintenance, and of vegetated basins to specifically check vegetation growth, replant dead specimens, bare patches, identify need to harvest and replant, check measures draining appropriately and media not blocked.
DPI - NoW	3.04		The Groundwater Management Plan must include: - baseline data on groundwater levels and quality, - a program to monitor groundwater levels and quality beneath the site, and groundwater dependent ecosystems, - groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts, and - a protocol for the investigation and mitigation of identified exceedences of the groundwater impact assessment criteria.	A Groundwater Management Plan will be prepared and implemented. The plan will identify appropriate sampling techniques, locations and provide baseline and operational data. Bi-annual ground water monitoring is proposed at the site to assess ammonia and nitrogen concentrations and the effects of improvement on the management of ammonium nitrate on the site. Groundwater monitoring parameters will include Ammonia as N, Total Oxidised Nitrogen, pH, EC, dissolved Arsenic, dissolved Cadmium, dissolved Copper, dissolved Zinc and PAH.
Department of Primary Industries – NSW Fisheries	4.01	**Impacts on water sources/Flood mitigation**	Fisheries NSW has concerns in relation to the risk of AN being lost into the river system and its toxicity to a range of aquatic organisms. Fisheries NSW noted that the risk is adequately addressed, however Fisheries NSW would expect that any approval would make the flood proofing of the structures and operations at the site mandatory and of an extremely high priority. A condition of consent should be placed on the approval, requiring the proponent to develop a flood mitigation strategy in conjunction with the relevant public authority, with a requirement for an annual inspection to assess the readiness of the facility to be flood proofed.	Acceptable as a condition of approval.
DPI - NSW	4.02	**Stormwater**	Fisheries NSW is also concerned about the high levels of ammonia	Noted. As detailed in *Section 5.3.3* of the EIS (Vol I), it is considered

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Fisheries		**Management**	and nitrogen in the soils and groundwater on the site, potentially indicating poor handling or spillages of material in the past. Due to the close proximity of the surrounding wetlands and the existing poor standard of stormwater management, Fisheries NSW supports the development of an upgraded stormwater system as outlined in the EIS to improve water quality of the stormwater leaving the site.	that the primary stormwater management measures proposed for the site would significantly improve stormwater quality when compared to the existing conditions on-site, and that provision of a secondary series of source controls including improved housekeeping, site regrading, surface protection, improved drainage and a wheel wash bay would further substantially reduce the exposure of pollutants to stormwater. Subsequent to preparation of the EIS, it has been identified that cracking/expansion joints within the floors of Storage Sheds A and B may be a potential pathway for transfer of AN to surface and groundwaters. As such, in addition to the stormwater management measures outlined in the EIS, the Proponent is also committed to implementing building modifications within Storage Sheds A and B that incorporates the sealing of the concrete floor expansion joints/voids with impervious epoxy resin to eliminate this potential surface/groundwater product exposure pathway.
NSW Department of Trade and Investment – Mineral Resources Branch (MRB);	5.01	**Mineral Resources**	MRB notes that the proposal is within Petroleum Exploration Lease (PEL) 458, held by Macquarie Energy Pty Ltd. MRB does not raise any concerns in relation to the proposed development.	Noted.
Office of Environment and Heritage (OEH)	6.01	**Threatened Species - Preliminary Assessment**	OEH'S main concerns regard the indirect impacts on: Swamp Oak floodplain forests; Freshwater wetlands on coastal floodplains EEC and the habitat they provide, particularly for the Black-necked Stork, Magpie Geese and the Green and Golden Bell frog, namely stormwater runoff, potential changes to hydrological regimes, and light and noise pollution. It stated that a review of on-site impact mitigation	Assessments of the impact of the proposal on threatened species and endangered ecological communities have been provided in *Annex F* of the EIS. It is noted that the Swamp Oak EEC to the north west of the development site is on the western side of the rail corridor. Small stands of Swamp Oak along the property boundary are not remnants of that EEC appearing to have been planted and so are not representative of the EEC. The rail acts as a levee with surface waters

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			measures proposed in the EIS appear to be adequate, though OEH requests that the final EIS ensures that any potential indirect impacts on adjacent EECs and threatened species habitat are adequately addressed.	from the west of the development site directed towards Ironbark Creek to the east of the rail corridor. Therefore in the case of potential contamination of surface flows, these would not reach the stand of EEC to the west of the railway and ostensibly upgradient. With respect to noted bird species, the Magpie Goose and Black-necked Stork, these species may utilise the wetland habitat of 2HD wetland on an opportunistic basis as part of a large regional home range. Magpie Geese are known residents around Shortland in particular Hunter Wetlands Centre, Newcastle University Wetlands and Market Swamp. Black-necked Stork has been recorded in low numbers from wetlands in the Lower Hunter River generally from April to September. The 2HD wetland is likely to represent potential habitat for both species as part of a larger home range, although they are not known to specifically inhabit that wetland. The proposal will not clear habitat for any of the listed threatened species nor EECs. Assessment of the impact (indirect) of the proposal on the listed threatened species, EEC and habitat of same, has not indicated any change in key characteristics of habitat quality such as hydro-chemical factors (such as surface and ground water flow volumes; frequency of inflows; water levels; salinity/pH). Field results and assessment are not 'before' putative impact as the site has been used for a similar purpose (fertilizer storage) since 2000. It should be noted that the proposed improvements in stormwater management and product handling and storage ('housekeeping') for the approved development would reduce release of potential pollutants from the site."
OEH	6.02	**Adequacy of assessment of potentially affected natural systems**	The EIS correctly describes the hydrogeology of the region as part of the Hexham Swamp Soil Landscape comprised of alluvial sediments, with groundwater levels encountered between 0.5-2.32m below the surface. The surface drainage flows in two directions across the site, in a west to east direction across the site	Surface drainage flows have been described by BMT WBM (2012) in *Annex E* and these have been considered in the ecological assessment in *Annex F*. Surface water flows ultimately meet Ironbark Creek via drainage lines to the east of the rail corridor. Surface flows in the western catchment of the site (see Figure 2-5 of *Annex E*) are directed

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		(a) Hydrological Environment	in the southern end into '2HD Swamp', from which it flows in a north-west direction into Hexham Swamps. The Groundwater Dependent Ecosystems near the site are described as the Freshwater Wetlands and the Hunter Estuary wetlands in the Hunter are highly groundwater dependent (Kuginis et al 2012). The EIS notes that soil in the vicinity of current operations and the groundwater have elevated levels of ammonia/um and nitrate. The EIS claims there are no historical water sampling data available from the site or from adjacent lands.	towards an open drain in the rail corridor which redirects surface drainage to the drainage line to the north of the development site. Surface flows in the east drain into 2HD swamp then to the north, north east of the site. The Main Northern Railway acts as a levee for surface water flows. Groundwater contours and inferred flow directions are described in Figure 4 of the Phase II Environmental Site Assessment provided in *Annex D* of the EIS. Based on groundwater contours inferred flow direction is to the west of the site. All of the assessments acknowledge that the wetlands in the environs are groundwater dependent. With respect to water sampling data it is noted that there is some surface water data available for the period December 2008 to September 2011 from the Hexham Swamp Rehabilitation Water Quality Monitoring program (HCRCMA 2012) for the adjacent lands and that these results are summarised in the BMT WBM report (2012) provided in Figure 2-4 of *Annex E* of the EIS (Volume III). This program included sites in Ironbark Creek upstream of the proposed development (King Street Shortland), the 2HD wetland, and at the floodgates of Ironbark Creek (downstream of the proposed development site).
OEH	6.03	**Adequacy of assessment of potentially affected natural systems** **(b) Water Quality**	The water sampling study provides only a 'snapshop' of conditions and cannot be compared to any historical data, making establishment of baseline levels difficult. Another fault in the design of the sampling is the establishment of Site 1 as the reference site, despite obvious algal blooms from eutrophication and high nitrate levels. It is not appropriate to use such a contaminated site in order to draw conclusions about the health of other sampling sites.	While it is noted that Site 1 is not pristine, it was justifiably chosen as representative of the immediate environs and a site that was not receiving surface water (and potential contaminants) from the proposed AN site. The water quality at the site and its data present a legitimate experimental control site, as it is devoid of the aspect-impact element associated with the proposed AN facility. It is acknowledged that Site 1 may well be enriched due to its location in the environment (next to the former Astra Street Landfill) and that 2HD Swamp itself also has a history of effects from a variety of

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				adjoining land uses. What available data do show, is that waters in wetlands close to the proposed AN facility are typical of waters in wetlands throughout the Shortland wetland complex, subject of past catchment disturbance. Establishment of a natural undisturbed baseline level is problematic given the history of the proposed development and lands fringing the wetland complex generally. Also, the same if not similar products (ie fertilizers) have been stored on the site since 2000 and the results presented in the Ecology assessment and HCRCMA (2012) are not pre-disturbance data. While the samples taken by the ecologist were only a 'snap shot', the BMT WBM report provided surface water quality data of 2HD swamp and two sites in Ironbark Creek (see Section 2.4.5.2, Section 2.4.5.3 and Figure 2.4 of *Annex E* of the EA). WBM discuss results of up to 12 monitoring rounds from December 2008 to September 2011 as part of the Hexham Swamp Rehabilitation Water Quality Monitoring program by HCRCMA (2012). The 'snapshot' results presented in the Ecology Assessment (*Annex F* of the EIS) for ammonia are similar to so validated by the median results for 2HD swamp as presented in the WBM report. Specifically, total un-combined ammonia recorded by ERM in 2HD swamp ranged from 30 to 120µg/L while the average HCRCMA results were 120µg/L. The HCRCMA results for 2HD swamp were slightly lower than those reported within Ironbark Creek at King Street Shortland (150µg/L) and similar to the median results at the Floodgates (130µg/L). With these ammonia concentrations shown to be present regionally, 'obvious' algal content (enriched chlorophyll-a levels) would typically be expected and the presence of algae was also shown at physio-graphically similar sites (unflushed freshwater sites) in the available set of monitoring sites. The evidence is that water quality at wetlands close to the proposed AN facility is not different to that of the southern part of the

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				Shortland wetland complex. Ongoing water quality monitoring is proposed as part of the stormwater and groundwater management plan for an approved AN facility.
			The water quality Table 5.10 compares the water quality samples to ANZECC threshold use values in Chapter 8, though for assessing impacts on ecological systems, it is more appropriate to use values in Chapter 3, which gives a threshold value for Ammonia-N as 20 µg/L and Total N at 500µg/L.	Given the receiving environment of interest (freshwater wetlands, as opposed to lowland rivers), ERM has also used the values as presented in Table 3.4.1 of ANZECC guidelines (2000) which relate to ammonia toxicity. This is because unlike other typical nitrogen species, ammonia can have an indirect effect through change on trophic status and directly through toxicity on aquatic biota so guidance from both Table 3.4.1 and Table 3.3.2 is warranted.

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				The guidelines acknowledge that different levels of protection may be appropriate for different water bodies and specify three levels of protection corresponding to the condition of the ecosystem. Table 3.4.1 of the ANZECC guidelines identifies trigger values for toxicants at alternative levels of protection. In Table 3.4.1 the toxicity trigger value for ammonia is identified as 320µg/L for 99% level of protection (% species), as 900µg/L (at pH 8) for 90% level of protection (for slightly to moderately disturbed systems) and 1430µg/L for 90% level of protection. Given that 2HD wetland is an artificial wetland indirectly impacted by past and current landuses such that the "aquatic biological diversity may have been adversely affected to a relatively measurable degree by human activity" it is reasonable to consider the ecosystem to be 'slightly to moderately disturbed' as defined in the guidelines (p3.1-10, ANZECC 2000) and the toxicity trigger value of 900µg/L, for 95% protection, was chosen as appropriate. In terms of pulse events associated with runoff loads after rainfall, BMT WBM applied the toxicity trigger of 910µg/L of the potential impacts on the receiving environment potentially resulting from the release of ammonium nitrate from the site under 1% annual exceedance probability (AEP) flood condition. Refer to Section 4.1, Annex E of the EIS and Figures 4.2 to 4.5. For consideration of aquatic trophic status (in relation to use of Table 3.4.1 entries), 20 µg/L may be an appropriate trigger level. However, available data show that this median concentration is not met at any of the monitoring sites, including in a freshwater section of Ironbark Creek Shortland (upgradient of the proposed development) and the Floodgates. While this diverges from the ANZECC "default" trigger, median concentrations well above those levels indicate a regional effect.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
OEH	6.04		Nitrite has a high affinity for Chlorine and induces the conversion of haemoglobin to methaemoglobin which is incapable of binding oxygen. Methaemoglobinemia following exposure to N02 has been demonstrated in amphibians (Punzo and Law, 2006) and is likely the root cause of mortality, sluggish growth and development, and behavioural traits observed among embryonic/ larval amphibians exposed to up to 20,0001JgN02 /L (Griffis-Kyle, 2005, 2007).	Noted
OEH	6.05		Ammonia or Ammonium does not persist in water for very long as its presence and persistence is dictated by: (1) losses of NH3 gas to the atmosphere; (2) a pH (and temperature) dependent equilibrium between un-ionized NH3 and the relatively non-toxic ionized NH4p; and (3) the sequential conversion of NH4 p to nitrite and nitrate by Nitrosomonas and Nitrobacter bacteria, respectively. Because ammonia and nitrite are transient within the environment, high environmental concentrations are usually only found at point source discharges or after heavy rainfall events. The water monitoring Site 2 in the 2HD Swamp is 3 to 4 higher than other parts of the swamp suggesting a higher than background level and possible point source of contamination.	The ecology assessment concludes that "surface water quality at sites adjacent to the Proponent site identified elevated concentrations of nitrates and total phosphorus in 2HD Swamp and at a location downstream from the swamp". As noted in OEH response #3 above, the ammonia concentration at Site 2 is in keeping with the median concentration value reported within 2HD wetland by HCRCMA (2012) over a sampling period from 2008 till 2011. This concentration is less than the median concentration values reported within Ironbark Creek at King Street, Shortland (upstream of where any surface flows from the Proponent facility may reach the Ironbark Creek system) and or slightly lower than the median concentration values reported at the floodgates on Ironbark Creek (downstream of where any surface flows from the Proponent facility may reach the Ironbark Creek system).
OEH	6.06		Due to its higher persistence in the environment, focus is often given to Nitrates, however, Nitrate is not considered to be particularly toxic, or more accurately, a mechanism of toxicity has not been described. However, eutrophic conditions can lead to the detrimental proliferation of toxic algal blooms (Camargo and Alonso, 2006). However, under less than extreme conditions, the proliferation of algae and macrophytes that occurs in nitrate enriched systems appears to either benefit (by providing a source of food and habitat) or have no effect on amphibian communities	Noted

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			(Massa! *et at.,* 2007). Baker and Waights (1994) showed that sodium nitrate causes sub-lethal- growth and behaviour in the Australian frog species *Litoria caerulea.*	
OEH	6.07		The salt levels in the '2HD Swamp' are described as high and the dissolved oxygen levels are given as low though aerobic conditions are still thought to exist despite high levels of oxidation. The high levels of nitrates and phosphorous have no doubt given rise to algal blooms in the water body, which in turn has resulted in the depletion of the dissolved oxygen further reducing its ecological function.	ERM agrees with this result and notes that as detailed in Section 5.3.3 of the EIS (Vol I), it is considered that the primary stormwater management measures proposed for the site would significantly improve stormwater quality when compared to the existing conditions on-site, and that provision of a secondary series of source controls including improved housekeeping, site regrading, surface protection, improved drainage and a wheel wash bay would further substantially reduce the exposure of pollutants to stormwater. Subsequent to preparation of the EIS, it has been identified that cracking/expansion joints within the floors of storage sheds A & B may be a potential pathway for transfer of AN to surface and groundwaters. As such, in addition to the stormwater management measures outlined in the EIS, the Proponent is also committed to implementing building modifications within Storage Sheds A and B that incorporates the sealing of the concrete floor expansion joints/voids with impervious epoxy resin to eliminate this potential surface/groundwater product exposure pathway. Proposed water quality monitoring programme will provide a mechanism to monitor the key water quality parameters.
OEH	6.08	**Fauna and Flora Survey Effort**	OEH has reviewed the effort and sampling design for the 'Ecology Assessment' (Volume Ill) acknowledges that the general baseline flora and fauna survey components have some deficiencies, though is an acceptable level.	Noted.
OEH	6.09	**Flora and Fauna Risk Assessments:**	The EIS (Volume II: Phase 1 Environmental Site Assessment - Final) provides an "issue identification" which includes various sources of off and on site contamination. It identifies a number of sources on-site, sources, particularly historical in-fill with unknown	As discussed in *Annex D* of the EIS.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			substances, the ammonium nitrate storage areas, disused diesel tanks, a workshop area where hydrocarbons are used, use of chemicals within the wash bay and a rail siding along one boundary of the site.	
OEH	6.10		With respect to the ammonium nitrate storage, the EIS states that the sheds and the outdoor storage area " ...represent a potential source of contamination...as a result of probable historical leaks and spills, potentially contributing to excessive levels of Ammoniacal Nitrogen and Nitrate-Nitrogen within soil and groundwater" and " Historical leaks and spills are considered likely to have occurred as a result of storage of general fertiliser ... according to site personnel, a fertiliser release occurred from the southwest corner of Shed B however site staff were unable to provide information on the date and quantity of the release."	As discussed in *Annex D* of the EIS.
OEH	6.11		Offsite sources of contamination include contaminated lands, railway facilities, petrol storage and infill of surrounding lands which further exacerbate the overall background levels of site contamination.	As discussed in EIS.
OEH	6.12		The main body of the EIS provides a risk assessment which gives potential impacts in the following way:	-
OEH	6.12.a		• flooding as an "extreme risk', a catastrophic impact with very serious impairment of ecosystem function, even after establishment of a flood risk management and response plan	The risk assessment provided in *Table 4.4* of the EIS for Operational risk provides the assessment as referred to by OEH. This assessment is in keeping with the modelling undertaken by BMTWBM in *Annex E*. Further refinement of the flood mitigation plan are being developed by the proponent. Also certification of the structural integrity of the sheds under flood event (to minimise risk of contamination of floodwaters) will be undertaken by the proponent.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
OEH	6.12.b		• spillage of dangerous goods as "moderate risk' though impacts to the environment is not stated	The risk assessment provided in *Table 4.4* of the EIS (Vol I) refers to spillage of dangerous goods into the environment or atmosphere and outlines proposed controls to reduce the risk to 'As Low As is Reasonably Practicable' to limit likelihood of spillage through design and location of storage sheds in accordance with AS4326, management of operations and safety management systems to minimise risk of spillage and subsequent impact on the environment. Consideration of the indirect impacts of a spillage on the environment has been provided in assessment of risk associated with flooding.
OEH	6.12.c		• impacts on Aboriginal cultural heritage as a "low risk''	Given that the works will be undertaken within imported fill material the likelihood of disturbance of Aboriginal places or objects is considered 'rare' ie may occur only in exceptional circumstances. Notwithstanding this, should any objects or sites be identified during construction control measures as specified in the EIS will be implemented.
OEH	6.12.d		• water pollution as a result of construction activities associated with stormwater control devices which is given a misleading assessment as the categories used should have yielded a "high risk''.	This reference is to the potential impacts on water pollution during construction of stormwater control devices. It is acknowledged that the pre-mitigation risk ranking for water pollution potential impact in *Table 4.4* of the EIS (Vol I) should have provided a risk ranking of 17 being 'high' risk (not 7 moderate as stated). Importantly the implementation of the proposed controls reduces the post mitigation control risk assessment to 'low'.
OEH	6.12.e		Based on the evidence, OEH considers the risk of contamination of " dangerous goods", however, as being"high" and likely to be ongoing.	It is assumed that OEH in their submission are saying that the risk of contamination of the site and environment from dangerous goods is high and likely to be ongoing. Revised mitigation measures to flood proof the storage sheds and improve the integrity of the concrete floors in these sheds, in combination with improved management of stormwater on and from the site are considered to reduce this risk. Modelling of stormwater structure by BMTWBM have confirmed that these structures alone will meet NCC targets for reduction of Total

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
				Phosphorus and Total Nitrogen for stormwater.
OEH	6.13	**Threatened species assessments**	While most of the focus of the EIS is on the direct impact upon an impoverished site, OEH would like to remind the applicant that as much due consideration should be given to offsite or 'indirect' impacts as per the assessment of significance guidelines (DEC 2004). Pursuant to this approach, assessments of the significance should have been provided in the '7 Part test' format for both direct and indirect impacts.	The ecology assessment provided in *Annex F* describes indirect impacts of the AN facility on 2HD swamp and nearby receiving waters and provides consideration of impacts of continuation of operation on the Swamp Oak EEC, threatened species and habitats. The proposal will not clear habitat for any of the threatened species or EECs. Assessment of the impact (indirect) of the proposal on the threatened species, EEC and habitat of same, under Section 5a of the EP&A Act is problematic given that the field results and assessment are not 'before' impact as the site has been used for this purpose or similar (fertilizer storage) since 2000. Importantly, the proposed improvements in storage and handling of product, stormwater management and 'house-keeping' of the development site will reduce inflow of pollutants in surface water to the adjoining habitats. Continuing operations is not expected to significantly impact on water quality further such that threatened species, ecological communities or their habitats will be reduced, modified or fragmented.
OEH	6.14		OEH is of the opinion that in general the risk posed by Ammonium nitrate contamination has been overlooked in the EIS. This is particularly true of the impacts upon the species which may utilise the '2HD Swamp', groundwater systems, the surrounding SEPP 14 lands and endangered ecological communities. For example the analysis relating to the Green and Golden Bell Frog (GGBF) seems to discount any possible impact from Ammonium nitrate,	The statements in the ecology assessment regarding factors that contribute to a decline in suitability of habitat for the GGBF are supported by references. It is acknowledged in the literature that the habitat preference and requirements of the GGBF are not well understood and difficult to define (Mahony 1999). There is contention surrounding the effect of predator fish and hydroperiod on local habitat use. The relationship between water chemistry and

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			attributing " *...drought conditions, disease (chytrid fungus), salinity and Mosquito fish are potential causal factors for the decline of the population.*" and "*The introduced Mosquitofish was observed in all aquatic habitats within the Study Area. Studies have shown Mosquitofish predate on Green and Golden Bell Frog tadpoles (Morgan and Buttemer 1996) and have also suggested that presence of the Mosquitofish in permanent water bodies reduces their suitability as breeding sites (Hamer et at. 2002). The presence of Mosquitofish in very high abundance within water bodies of the Study Area is considered to significantly reduce its suitability for the Green and Golden Bell Frog.*" While it is true that the Mosquitofish are considered a threat to the GGBF, this fish is present in all known sites where the GGBF is still found (except the Broughton Island population, Robert Quirk, NPWS, pers. comm.).	GGBF occupancy and pond choice is unclear. Given that the water chemistry values did not exceed the NSW trigger values this would suggest the water quality is within an acceptable range.Notwithstanding this, it is likely that a suite of factors including size of waterbodies, shading, nutrient levels, water temperature, vegetation succession, characteristics of adjoining terrestrial habitat, presence of predatory fish, distance to the nearest occupied pond and population size all contribute to habitat suitability and long-term viability of populations.
OEH	6.15		It is now widely considered that the Key Threatening Processes 'Alteration to the natural flow regimes' and 'Amphibian chytridiomycosis' are much more significant factors that have lead to the decline of this species. Tidal inundation is also known to have potentially catastrophic impacts for GGBF (Prof. Mike Mahony, University of Newcastle, pers. comm.). The impact of pollutants on natural systems has often been overlooked as a significant factor due to a lack of investigation into this area, particularly in Australia, and also has implications for the conservation of the GGBF (Mann and Bidwell 1999). A wide usage of fertilisers may have deleterious effects on frog populations particularly via impacts on tadpole development. In overseas studies, high nutrient loads of nitrate, ammonia and phosphate have been implicated in frog declines (Berger, 1989). It also may be that reduced tadpole health will lead to increased risk of predation.	Refer to response above (OEH Item 6.14).
OEH	6.16		It is worth noting that the Australian frog fauna has evolved in an environment that is comparatively depauperate in nitrate and phosphate (Lamont 1994) which may accord Australian frogs a	Noted

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			greater sensitivity to these chemicals. An assessment on the IUCN Red List of Endangered Species website for 2008 indicate that after habitat loss, pollution is the next major threatening process to amphibian populations.	
OEH	6.17		The population of at least 100 adult GGBF in the '2HD Swamp' was last recorded in 2004 and (assuming that its continued presence was not overlooked by recent studies); it is not known precisely when this population disappeared or the reasons for its disappearance, however, given the circumstantial evidence of ammonium nitrate contamination of the local water systems and the known toxicity of these chemicals, a direct link cannot be discounted.	While a number of frog species were observed or heard calling from 2HD Swamp during the site inspection the ecology assessment acknowledges that the site inspections were undertaken at the end of the optimum period for detection of GGBF and that survey effort was not sufficient to meet the EPBC Act survey guidelines for the species. The assessment also acknowledges that further surveys during optimum survey period may detect this species. While it is not known precisely when (or if) the population of GGBF disappeared from 2HD Swamp a report for the nearby Newcastle Wetlands Reserve and Market Swamp complex, reported that the population in the 2HD swamp disappeared some time prior to 2006. The EIS acknowledges that storage of AN and/or fertilizer has occurred on this site since 2000. While the ecology assessment did not seek to identify why the previous population of GGBF has not been recorded in 2HD Swamp since 2004, ERM acknowledges that the water quality in combination with a number of other factors (as listed in OEH Item 6.14) may have contributed to a reduction in the suitability of the habitat for the GGBF.
OEH	6.18		The results of the macro-invertebrate survey also show a depauperate fauna, (notwithstanding the survey constraints) indicating in general, a fauna typical of sub-optimal water conditions.	ERM does not contend that the water quality of 2HD Swamp is sub-optimal. The macro-invertebrate survey identified that while diversity was quite low, this may be explained by seasonal influences (winter sampling) and lack of diversity of macrophytes. Notwithstanding this, the water was of sufficient quality to support two species ranked as 'sensitive' to pollution.

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OEH	6.19		In conclusion, there is ample evidence that the wetland areas found offsite have suffered extensive and possibly ongoing contamination both from the proponent and from other surrounding sources. Continuation of this impact is likely to pose serious risks for aquatic life, threatened species and groundwater dependent ecosystems.	This statement does not acknowledge that the proposed improvements in management of the site including storage of material, stormwater management and general housekeeping are anticipated to improve water quality and would meet the Newcastle City Council stormwater pollutant load reduction targets for Total Suspended Solids, Total Phosphorus and Total Nitrogen, as reported by BMTWBM in *Annex E of the EIS*.
OEH	6.20	**Provision of Mitigating Actions**	The EIS proposes a series of mitigating actions to control stormwater runoff across the site, including "Treatment Zones", "Surface Protection", "Minor site regrading", "Drainage headwalls" and additional "Stormwater Pits". Inherent in the modelling proposed is that there will be 45 per cent reduction in levels of Total P entering the wetland areas to the east of the facility. No target has been set for Total N or ammonia N.	Table 2-14 of *Annex E* of the EIS lists the estimated annual average flow and pollutant loads from the site for the existing and proposed (with treatment) scenarios. The modelling predicts a 65% reduction in Total Phosphorus from 15.9kg/year to 5.5kg/year and a 53% reduction in Total Nitrogen from 319kg/year to 150kg/year. The modelling indicates that the structures will meet the NCC DCP targets of 65% reduction for Total Phosphorus and 45% reduction for Total Nitrogen that have been adopted for this assessment for stormwater pollutant load reduction targets (see Table 2-2 of *Annex E*).
OEH	6.21		OEH believes that a positive outcome for this State Significant Development would be to improve the water conditions of the '2HD Swamp', groundwater and surrounding surface water systems by eliminating any further contamination from ammonium nitrate and reducing overall nitrate and phosphate loads. This needs to be achieved via an ongoing water quality monitoring programme. The aim of this programme would be to feedback situations where improvements to the stormwater control regime are improved where necessary, using an adaptive approach.	A bi-annual ground and surface water monitoring programme is proposed at the site to assess ammonia and nitrogen concentrations and the effects of improvement on the management of ammonium nitrate on the site. The surface water monitoring programme will assess as a minimum in-situ water quality measurements (temperature, salinity, dissolved oxygen, pH and oxidation-reduction potential) with laboratory analysis reporting on Ammonia, Total Oxidised Nitrogen (nitrite and nitrate), total phosphorus and chlorophyll-a levels. As identified in the EIS, a groundwater monitoring programme will be implemented across the site to assess ammonia and nitrogen concentrations and the effect of improvements on the management of AN on-site. Groundwater monitoring parameters will include ammonia as N, Total Oxidised Nitrogen, pH,

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
				dissolved Arsenic, dissolved Cadmium, dissolved Copper, dissolved Zinc and PAH.
OEH	6.22	**Flooding Issues**	The site is located wholly with in the floodplain of the Hunter River. Annex E of the EIS includes a Stormwater, Flooding and Receiving Water Quality assessment by BMT-WBM. The report notes that the threshold for Hunter River flooding to impact the site is the 2% AEP deign flood event, where flood depths of approximately 0.4 metre are anticipated to inundate part of the site. In a design 1% AEP flood, flood depths of between 1 to 1.8 metres are anticipated across the whole site.	Agree
OEH	6.23		The proposed development does not involve the construction of any additional buildings or structures on the site.	Agree
OEH	6.24		The proponent has stated that local flooding issues can be managed and mitigated primarily by good practice stormwater management measures as outlines in the Stormwater Management Concept Plan - Figure 2.7- of the BMT-WBM report.	Agree

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
OEH	6.25		Mitigation for mainstream Hunter River flooding will primarily involve emergency site and response planning. On-site management of flood mitigation specifically for the management of the hazardous chemicals has been detailed in section 4.4.3 of the EIS. The flood emergency response equipment should be able to withstand floodwaters up to and including the 1% AEP plus 500mm freeboard depth.	Noted
OEH	6.26		Due to the nature of flooding expected across the site during a major flood, refuge should never be taken on-site during a flood. The BMT-WBM report recommends updating the Site-based Emergency Response Plan be modified to include evacuation due to flooding.	Noted
OEH	6.27		The EIS also states that structural certification will be undertaken for all the storage sheds on the site so that they can withstand floodwaters up to and including a 1% AEP design flood event. This structural certification should be up to the 1% AEP plus 500mm freeboard depth.	The Proponent has engaged a certified structural engineer to provide certification of storage sheds A and B to withstand the 1% AEP design flood event plus 500mm freeboard depth. A copy of the structural certification documentation will be forwarded to DP&I.
OEH	6.28		The proponent is responsible for the maintenance of this on-site flood emergency response plan, and any updates that may be required to it in the future. The occupation and use of this site should place no extra requirements on the State Emergency Services for assistance during flood times.	Agree
OEH	6.29 6.30	**Aboriginal Cultural Heritage**	**Recommended Conditions for Approval:** The proponent must detail procedures for managing the Aboriginal cultural heritage values associated with the project area in relevant sections of the Construction Environmental Management Plan and the Operational Environmental Management Plan prepared for the project. These measures must be developed in consultation with representatives of the local Aboriginal community.	Agree

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
OEH	6.31		In the event that surface disturbance identifies a new Aboriginal object, all works must halt in the in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeological specialist and representatives of the local Aboriginal community must be contacted to determine the nature, extent and significance of the object(s). The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) (managed by OEH) and the management outcome for the site included in the information provided to the AHIMS. The proponent will consult with representatives of the local Aboriginal community, and the archaeological specialist to develop and implement management strategies for all objects/sites. If impacts are unavoidable, mitigation measures are to be undertaken in accordance with the heritage component of the Construction Environmental Management Plan. All sites impacted must have an Aboriginal Site Impact Recording form completed and be submitted to the AHIMS Registrar within three months of completion of these works.	Agree
OEH	6.32		If human remains are located in the event that surface disturbance occurs, all works must halt in the immediate area to prevent any further impacts to the remains. The NSW Police are to be contacted immediately. No action is to be undertaken until the NSW Police provide written notification to the proponent. If the skeletal remains are identified as Aboriginal, the proponent must contact the OEH's Environment Line on 131 555 and representatives of the local Aboriginal community. No works are to continue until OEH provides written notification to the proponent.	Agree

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
OEH	6.33		An Aboriginal Cultural Heritage Awareness Program must be developed for the induction of all personnel and contractors involved in the construction activities on site. Records are to be kept of which staff/contractors were inducted and when for the duration of the project. The program should be developed and implemented in collaboration with the registered Aboriginal parties.	Agree
Environment Protection Authority	7.01	**Recommended Conditions for Approval**	**ADMINISTRATIVE CONDITIONS** **A1 Works to be undertaken in accordance with information supplied to the EPA** *Water and land* **EPA identification number** / **Type of Monitoring Point** / **Type of Discharge Point** / **Location Description** 1 / Groundwater Quality Monitoring / N/A / Groundwater monitoring well located up gradient 2 / Groundwater Quality Monitoring / N/A / Groundwater monitoring well located up gradient 3 / Groundwater Quality Monitoring / N/A / Groundwater monitoring well located down gradient 4 / Groundwater Quality Monitoring / N/A / Groundwater monitoring well located down gradient Notes: The applicant must undertake groundwater monitoring at four locations representative of both up gradient and down gradient of the site on a six monthly basis. The location of the monitoring sites must be provided to the EPA as eastings and northings with the application for an Environment Protection Licence (EPL) on a plan of the site that has been prepared by a registered surveyor. The site selection and monitoring must be undertaken by a suitably qualified person.	
EPA	7.02		A1.1 Except as provided by these conditions of approval, the works and activities must be undertaken in accordance with the proposal contained in: (a) 'Ammonium Nitrate Storage and Distribution Facility Environmental Impact Statement - Final Volumes I-III' Environmental Resources Management Australia December 2012; unless otherwise specified in these conditions of approval.	Accepted
EPA	7.03		A1.2 The applicant must not store more than 13,500 tonnes of ammonium nitrate at the premises at any one time.	Accepted
EPA	7.04		A2.1 The applicant must, in the opinion of the EPA, be a fit and	Accepted

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			proper person to hold a licence under the *Protection of the Environment Operations Act 1997*, having regard to the matters in Section 83 of that Act.	
EPA	7.05		**DISCHARGES TO AIR AND WATER AND APPLICATIONS TO LAND**	
			P1 Location of monitoring/discharge points and areas	
EPA	7.06		P1.1 The following points referred to in the table below are identified for the purposes of monitoring and/or the setting of limits for the discharges of pollutants to water from the point.	
EPA	7.07		P1.2 The following utilisation areas referred to in the table below are identified for the purposes of the monitoring and/or setting of limits for any application of solids or liquids in the utilisation area.	
EPA	7.08		**LIMIT CONDITIONS**	
EPA	7.09		**L1 Pollution of Waters** L1.1 Except as may be expressly provided by a license under the *Protection of the Environment Operations Act 1997* in relation of the development, Section 120 of the *Protection of the Environment Operations Act 1997* must be complied with in connection with the carrying out of the development.	Accepted
EPA	7.10		**L2 Waste**L2.1 The applicant must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.	Accepted

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
EPA	7.11		L2.2 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.	Accepted
EPA	7.12		**L3 Potential offensive odour** L3.1 No condition of the approval of this development identifies a potentially offensive odour for the purposes of Section 129 of the *Protection of the Environment Operations Act 1997*.	Accepted
EPA	7.13		L3.2 The applicant must not cause or permit the emission of offensive odour beyond the boundary of the premises. Note: Section 129 of the *Protection of the Environment Operations Act 1997*, provides that the applicant must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a license directed at minimising the odour.	Accepted
EPA	7.14		**L4 Hours of Operation** L4.1 Standard Construction Hours Unless otherwise specified by any condition of the approval all construction activities are: a) restricted to between the hours of 7:00am and 6:00pm Monday to Friday; b) restricted to between the hours of 8:00am and 1:OOpm Saturday; and c) not to be undertaken on Sundays or public holidays.	Accepted as standard construction hours
EPA	7.15		**L5 Noise** L5.1 Where a noise limit has not been prescribed, all operations and activities occurring on the premises must be conducted in a manner that does not cause offensive noise.	Accepted
EPA	7.16		L5.2 Noise operated at the premises must not exceed the noise limits in the table below. The locations referred to in the table	Accepted

<table>
<tr><th>Authority/ Author</th><th>ERM Ref</th><th>Issue Raised</th><th>Submission</th><th>Response</th></tr>
<tr><td></td><td></td><td></td><td>below are indicated by Table 5.17 in the 'Ammonium Nitrate Storage and Distribution Facility Environmental Impact Statement - Final Volume 1, Proponent Freightlines, Environmental Resource Management Australia December 2012'.
Noise Limits
<table><tr><th>Locality</th><th>Location</th><th>Noise Limits dB(A)
Day
$L_{Aeq(15\ min)}$</th><th>Evening
$L_{Aeq(15min)}$</th><th>Night
$L_{Aeq(15min)}$</th></tr><tr><td>R1</td><td>Residential receptor located on 49 Blanch Street</td><td>39</td><td>39</td><td>39</td></tr><tr><td>R2</td><td>Newcastle golf practice centre</td><td>55</td><td>55</td><td>55</td></tr><tr><td>R3</td><td>Residential receptor located on 24 Astra Street</td><td>42</td><td>42</td><td>42</td></tr><tr><td>R4</td><td>Residential receptor located on Wallsend Road</td><td>42</td><td>42</td><td>42</td></tr><tr><td>R5</td><td>Residential receptor located on Wallsend Road</td><td>42</td><td>42</td><td>42</td></tr><tr><td>R6</td><td>Residential receptor located on the eastern side of the Pacific Highway</td><td>57</td><td>48</td><td>54</td></tr><tr><td>R7</td><td>Residential receptor located on the western side of the Pacific Highway</td><td>60</td><td>57</td><td>48</td></tr><tr><td>R8</td><td>St Joseph's aged care and independent living</td><td>43</td><td>40</td><td>35</td></tr><tr><td>R9</td><td>Industrial receptor located within the same industrial area and south of Old Maitland Rd</td><td>70</td><td>70</td><td>70</td></tr></table>Note: The applicant must provide the EPA with address details for residential receptors in the above table with the application for an Environment Protection Licence.</td><td></td></tr>
<tr><td>EPA</td><td>7.17</td><td></td><td>L5.3 For the purpose of condition L5.2:
• Day is defined as the period from 6am to 6pm Monday to Saturday and 8am to 6pm Sunday and public holidays;
• Evening is defined as the period 6pm to 1Opm; and
• Night is defined as the period from 1Opm to 6am Monday to Saturday and 1Opm to 8am Sunday and Public Holidays.</td><td>Accepted</td></tr>
<tr><td>EPA</td><td>7.18</td><td></td><td>L5.4 The noise limits set out in condition L5.2 apply under all meteorological conditions except for the following:
a) wind speeds greater than 3 metres per second at 10 metres above ground level; or
b) stability category F temperature inversion conditions and wind speeds greater than 2 metres per second at 10 metres above ground level; or
c) stability category G temperature inversion conditions.</td><td>Accepted</td></tr>
</table>

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
EPA	7.19		L5.5 For the purpose of condition L5.2: a) data recorded by the Bureau of Meteorology - Newcastle Nobby's Station AWS must be used to determine meteorological conditions; and b) temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of the NSW Industrial Noise Policy.	Accepted
EPA	7.20		L5.6 To determine compliance:a) with the LAeq(15min) noise limits in condition L5.2 the noise measurement equipment must be located:• approximately on the property boundary, where any dwelling is situated 30 meters or less from the property boundary closest to the premises; or• within 30 metres of a dwelling fa9ade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable• within approximately 50 metres of the boundary of a National Park or a Nature Reserve;b) with the noise limits in condition L5.2 the noise measurement equipment must be located;• at the most affected point at a location where there is no dwelling at the location; orat the most affected point within an area at a location prescribed by conditions L5.6 (a) orL5.6 (b).	Accepted
EPA	7.21		L5.7 A non compliance of condition L5.2 will still occur where noise generated from the premises in excess of the appropriate limit is measured: • at a location other than an area prescribed by conditions L5.6 (a) and L5.6 (b); and/or • at a point other than the most affected point at a location.	Accepted
EPA	7.22		L5.8 For the purposes of determining noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels	Accepted

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			measured by the noise monitoring equipment.	
EPA	7.23		**OPERATING CONDITIONS** **01 Activities must be carried out in a competent manner** 01.1 Activities undertaken by the applicant at the premises must be carried out in a competent manner. This includes: a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Accepted
EPA	7.24		**02 Maintenance of plant and equipment** 02.1 All plant and equipment installed at the premises or used in connection with the activity of the applicant at the premises: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Accepted
EPA	7.25		**03 Dust** 03.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	Accepted
EPA	7.26		03.2 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.	Accepted
EPA	7.27		03.3 Trucks entering and leaving the premises that are carrying loads of dust generating materials must have their loads covered at all times, except during loading and unloading.	Accepted
EPA	7.28		**04 Stormwater/sediment control - Construction Phase** 04.1 Soil and water management controls must be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities in accordance with the requirements outlined in Managing Urban Stormwater: Soils and Construction (Landcom 2004).	Accepted

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
EPA	7.29		**05 Emergency Response**05.1 The Proponent must maintain, and implement as necessary, a current emergency response plan for the premises. The applicant must keep the emergency response plan on the premises at all times. The emergency response plan must document systems and procedures to deal with all types of incidents (eg: spills, explosions, fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. If a current emergency response plan does not exist at the date on which this condition is attached to the Environment Protection Licence, the applicant must develop an emergency response plan within three months of that date.Note: The emergency response plan must deal with flooding.	A site emergency plan exists for the site and details protocols in the event of a flooding emergency (refer EIS, Section 4.4.3). As outlined in Section 5.3.5 of the EIS, the plan will be updated to incorporate evacuation response to flooding.
EPA	7.30		**06 Waste** 06.1 The applicant must ensure that any liquid and/or non liquid waste generated and/or stored at the premises is assessed and classified in accordance with the EPA's Waste Classification Guidelines as in force from time to time.	Accepted
EPA	7.31		06.2 The applicant must ensure that waste identified for recycling is stored separately from other waste.	Accepted
EPA	7.32		**07 Other operating conditions** 07.1 All above-ground tanks containing material that is likely to cause environmental harm must be bunded or have alternative spill containment system in-place.	Accepted
EPA	7.33		07.2 All tanks and storage areas for drums and containers that contain material that has the potential to cause environmental harm must be bunded or have alternative spill containment system in-place.	Accepted

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
EPA	7.34		Note: The applicant must comply with the Protection of the Environment Operations (Underground Petroleum Storage System) Regulation 2008.	Accepted
EPA	7.35		**MONITORING AND RECORDING CONDITIONS M1 Monitoring records** M1.1 The results of any monitoring required to be conducted by the applicant must be recorded and retained as set out in this condition.	Accepted
EPA	7.36		M1.2 All records required to be kept by the applicant must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	Accepted
EPA	7.37		M1.3 The following records must be kept by the applicant in respect of any samples required to be collected for the purpose of this development: a) the date(s) on which the sample was taken; b) the time(s) on which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	Accepted
EPA	7.38		**M2 Requirement to monitor concentration of pollutants discharged** M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the applicant must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The applicant must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns.	Accepted

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
EPA	7.39		**M2.2 Water and/or Land Monitoring Requirements** **M2.2 Water and/or Land Monitoring Requirements** **Point 1,2,3,4** **Pollutant** / **Units of Measure** / **Frequency** / **Sampling Method** Ammonia as N — Milligrams per litre — Every 6 months — Grab sample Total Oxidised Nitrogen — Milligrams per litre — Every 6 months — Grab sample pH — pH units — Every 6 months — Grab sample Dissolved Arsenic — Milligrams per litre — Every 6 months — Grab sample Dissolved Cadmium — Milligrams per litre — Every 6 months — Grab sample Dissolved Copper — Milligrams per litre — Every 6 months — Grab sample Dissolved Zinc — Milligrams per litre — Every 6 months — Grab sample PAH — Micrograms per litre — Every 6 months — Grab sample	
EPA	7.40		**M3 Testing methods- concentration limits** M3.1 Subject to any express condition of approval, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.	Accepted
EPA	7.41		**M4 Requirement to monitor noise**M4.1 To assess compliance with Condition L5.2 attended noise monitoring must be undertaken in accordance with Conditions L5.6 and:a) at each one of the locations listed in Condition L5.2;b) occur annually during the applicants reporting period as defined by an Environment Protection Licence;c) occur during each day, evening and night as defined in the NSW Industrial Noise Policy for a minimum of ;• 1.5 hours during the day;• 30 minutes during the evening; and• 1 hour during the night.	Accepted
EPA	7.42		**M5 Recording of pollution complaints** M5.1 The applicant must keep a legible record of all complaints made to the applicant or any employee or agent of the applicant in relation to pollution arising from any activity to which activity applies.	Accepted

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
EPA	7.43		M5.2 The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided , a note to that effect; d) the nature of the complaint; e) the action taken by the applicant in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the applicant, the reasons why no action was taken.	Accepted
EPA	7.44		M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made.	Accepted
EPA	7.45		M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.	Accepted
EPA	7.46		**M6 Emergency Contact**	
EPA	7.47		M6.1 The applicant must provide the EPA with a nominated representative of the company that is available at all times and is capable of providing immediate assistance with a response during emergencies or any other incident at the premises. The name of the nominated representative and their contact details, including a telephone number must be current at all times.	Accepted
EPA	7.48		**REPORTING CONDITIONS**	
EPA	7.49		R2 Notification of Environmental Harm	
EPA	7.50		R2.1 Notifications must be made by telephoning the Environment Line Service 131555.	Accepted

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
EPA	7.51		R2.2 The applicant must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred. Note: The applicant or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.	Accepted
EPA	7.52		**SPECIAL CONDITIONS**	
EPA	7.53		E1 Water Quality Management System Effectiveness Monitoring	
EPA	7.54		E1.1 The Proponent must undertake monitoring and reporting of the effectiveness of the Surface Water Quality Management System within the first year of operation of the approved activity. The monitoring and reporting must be undertaken by an appropriately qualified person. The report must be provided with the first Annual Return submitted to the EPA.	Accepted
EPA	7.55		1. The monitoring must include, but not be limited to; a) sampling and analysis of the pollutants identified in the Table 1 below in accordance with Special Frequency 1; and b) include at least one sample collected upstream of the discharge point from the premises, at all locations where water discharges from the premises into the receiving environment and at least one sample downstream of the discharge point from the premises.	Accepted. Proponent proposes to undertake six monthly monitoring (in first instance) of surface waters to assess in-situ water quality measurements (temperature, salinity, dissolved oxygen, pH and oxidation-reduction potential) with laboratory analysis reporting on Ammonia, Total Oxidised Nitrogen (nitrite and nitrate), total phosphorus and chlorophyll-a levels. See response in NSW Office of Water Item #3
EPA	7.56		2. The location of all sampling sites, including easting and northings, must be provided on a plan of the site prepared by a registered surveyor, and included in the report.Note: Special Frequency 1 means in the event of a discharge, a grab sample of the water discharged must be collected at the following frequencies:a) Within the first 6 hours of any discharge occurring; andb) Every	Accepted

<table>
<tr><th>Authority/ Author</th><th>ERM Ref</th><th>Issue Raised</th><th>Submission</th><th>Response</th></tr>
<tr><td></td><td></td><td></td><td>seven (7) days thereafter for the duration of the discharge.
TABLE 1 Surface Water Quality Monitoring Parameters
<table><tr><th>Pollutant</th><th>Units of Measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Oil and Grease</td><td>Milligrams per litre</td><td>Special frequency 1</td><td>Grab Sample</td></tr><tr><td>Total Suspended Solids</td><td>Milligrams per litre</td><td>Special frequency 1</td><td>Grab Sample</td></tr><tr><td>Total Nitrogen</td><td>Milligrams per litre</td><td>Special frequency 1</td><td>Grab Sample</td></tr><tr><td>Total Phosphorus</td><td>Milligrams per litre</td><td>Special Frequency 1</td><td>Grab Sample</td></tr><tr><td>pH</td><td>pH units</td><td>Special frequency 1</td><td>Grab Sample</td></tr></table>Note: Monitoring must be undertaken such that the sample collected from the discharge point(s) at the premises is representative of the waters discharged from the premises to the environment.</td><td></td></tr>
<tr><td>EPA</td><td>7.57</td><td></td><td>3. If monitoring results do not comply with Section 120 of the Protection of the Environment Operations Act 1997, the proponent must include within the report options for upgrade of the water management system and a discussion of how the proponent will comply Section 120.
Note: The EPA will consider the outcomes of the report and Section 45 before undertaking any variations to an Environment Protection Licence which may include surface water quality limits being applied to the identified discharge point(s) at the premises.</td><td>Accepted</td></tr>
<tr><td>RMS</td><td>8.01</td><td>Traffic Impact</td><td>RMS has no objections to or requirements for the subject development as it is considered the development will have no significant impact on the classified (State) road network or the operation of traffic control signals.
Additionally, the developer should consult with Council regarding any appropriate upgrade works on Old Maitland Road between the access road to the site and the Pacific Highway.</td><td>Noted</td></tr>
<tr><td>NSW WorkCover</td><td>9.01</td><td>Hazard Analysis</td><td>To ensure that the hazards related studies required by DOPI under the DOPI conditions of consent are comprehensive and address all MHF related matters, WorkCover suggests that DOPI includes the following condition should DOPI determine to approve the</td><td>Noted.</td></tr>
</table>

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			proposal. *When preparing the Final Hazard Analysis (see condition No. XXX), Safety Management System(condition No.zzz) and the Emergency Plan(condition No.YYY) for the site, the Proponent must address all hazards that can contribute to both on-site and off-site risks and ensure that both on-site and off-site risks are evaluated. All maps showing risk contours must include the contours for on-site risk in addition to off site risk.*	
Newcastle City Council	10.01	**Hazard Risk Assessment**	The proposed storage quantities stated in the Hazard Analysis (HA) prepared by Health & Safety Essentials differ from those indicated in the EIS (and in other supporting reports). EIS • Shed A -4,500t • Shed B -3,500t and 1,OOOt in Shed B compound • Shed C- 3,500t and 1,OOOt in Shed C compound HA • Shed A -4,500t • Shed B- 4,500t • Shed C- 4,000t and 5OOt in Shed C compound	The storage capacities within each storage shed/compound are dependent on and vary based on different AN bag sizes (from different sources). The total storage quantities within the EIS and HA are based on total maximum storage capacity. The EIS incorporated storage combination for Sheds B & C (inside and outside the shed) that are based on the historical average/standard operating scenario for these sheds, while the HA has considered the worst case scenario for risk modelling purposes. AN storage will be in accordance with the configuration outlined in the HA. That is, storage of a maximum of 4,500t AN within each of Sheds A and B, and up to 4000t within Shed C and 500t within containers in the compound of Shed C.
Newcastle City Council	10.02		As a result of the above discrepancies the incident scenarios in the HA are based on loaded shipping containers being stored only in the compound of Shed C. It is noted that the compound of Shed B is located immediately northeast of the Newcastle Golf Practice Centre which is located on part of the adjacent Council Astra Street landfill site. This is particularly relevant given the HA already acknowledges that in relation to the above golf driving range the proposed development does not comply with the quantitative criteria for 'sporting complexes and active open space areas' specifiedin the Department of Planning publication 'Hazardous Industry Planning Advisory Paper (HIPAP) No 4 -Risk Criteria for	The Hazard Analysis is based on Proponent the proposed storage arrangements. Storage will be in accordance with the quantities and locations specified in the Hazard Analysis.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			Land Use Safety Planning.	
Newcastle City Council	10.03		Given the above circumstances, it is requested that the applicant be required to submit an amended HA, based on the correct storage quantities that demonstrates, as required by the Director General's requirements for the Preliminary Hazard Analysis, that the proposal will comply with the criteria set out in HIPAP No 4.	Refer to responses provided to Newcastle City Council Item No 2.
Newcastle City Council	10.04	**Flooding Issues**	The subject site is subject to flooding from the Hunter River. A principal concern is the potential release of ammonia nitrate from the site under flood conditions.	This has been considered in the EIS and specialist studies. With respect to flooding it should be noted that the site is located in a backwater area of Ironbark Creek. During large floods, flow velocities are very low and flood levels across large areas of Hexham Swamp and the Ironbark Creek catchment are similar. Whilst flow velocities are low at the site during large floods, the modelling results suggest there is a slight flow gradient from west to east across the site that would direct slow moving floodwaters towards the 2HD Swamp prior to draining to the north to Ironbark Creek. During more frequent smaller rainfall events, the existing site levels and drainage systems control the direction that stormwater is discharged from the site. The east draining parts of the site flow to the 2HD Swamp, and the west draining parts flow to the railway corridor drain that in turn discharges to the same drainage line as 2HD Swamp.
Newcastle City Council	10.05		It is noted that flooding and receiving water quality modelling has been undertaken by BMT WBM P/L of two scenarios to identify the likely routes and ultimate fate of ammonia released from the three storage sheds on the site. According to the assessment report, during the 100 year (1% AEP flood) the site will suffer inundation by up to 1.8metres.	As noted in the EIS

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Newcastle City Council	10.06		The report concludes that: "*Under each scenario, AN release from Sheds A, Band C would result in ammonia concentrations in the local area well in excess of the relevant toxicity trigger value provided by the ANZECC guidelines. In all scenarios, this area of TTV exceedance extended from a minimum of approximately 2,200 metres downstream of the sheds to a maximum extent beyond the mouth of the Hunter River, some 14 kilometres from the site.* *Ammonia is highly toxic to a wide range of aquatic fauna (ANZECC}, and if it were to be released from the sheds as per the scenarios simulated, the consequences for downstream ecosystems are likely to be significant.*"	As noted in the EIS
Newcastle City Council	10.07		The following specific comments are offered in respect of this report: • The modelling was undertaken based on a 1% AEP flood level of 3.5metres Australian Height datum (AHD); Council's records indicate a flood level of 3.78m AHD. Therefore, the impacts may be greater than modelled. • The modelling scenarios simulated 1% . of the maximum stored Ammonium Nitrate (AN) in each shed being dissolved and released during the 1% AEP design flood. It is not clear from the submitted report and EIS what evidence was relied on to validate using the above percentage of the AN stored on the site. It being noted that the bags (ie flexible intermediate bulk container) used to store and transport the AN are only water resistant and likely to be immersed in floodwaters for a prolong period of time. • The modelling does not address the potential for loaded or partially loaded shipping containers to float from the site.	The TUFLOW modelling completed to evaluate flooding behaviour for the site applied an existing model developed by BMT WBM on behalf of Port Stephens Council for the Williamtown, Saltash and Williams River Flood Studies. The model has previously been applied by BMT WBM to assess the impacts of a number of developments within the Lower Hunter River Floodplain. We understand that the Newcastle City Council model used as a basis for defining flood planning levels in the lower Hunter River floodplain was last updated approximately 5 years ago. In the last 5 years, more detail has become available for key areas in the Hunter River floodplain that have a significant influence on flooding behaviour. BMT WBM has incorporated this additional detail into the Port Stephens Council model. Additional detail in these key areas is considered to provide an improved definition of flooding behaviour (based on current boundary conditions) and is likely to be the main reason for differences in peak estimated flood levels for the site. We understand that the Port Stephens Council and Newcastle City Council models currently adopt similar flow and water level boundary conditions. Meetings have been held recently with OEH to outline the changes and explain the reasons for the variations in flood levels between the

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				Port Stephens Council and Newcastle City Council models.
Newcastle City Council				Impacts on water quality based on higher 1% AEP flood level - A higher 1% AEP flood level of 3.78m AHD would result in an increased volume of water in the warehouses when compared to the BMT WBM modelled level of 3.5m AHD (assuming that the warehouses would not be watertight during a 1% AEP flood). Based on the assumption of 1% of AN dissolved in the floodwaters in the warehouses up to the 1% AEP flood level, the ammonia concentration in the water would be more diluted under Council's scenario (due to the same quantity of dissolved AN but increased volume of water). Therefore, based on this scenario, the predicted concentrations in the receiving environment would be lower and the impact extents reduced.
Newcastle City Council				It is impossible to quantify the maximum % of AN that may be dissolved and released during a 1% AEP design flood, however the proponent provided an estimate based on operational experience with respect to the durability of the bulka bags, understanding of the stacking configuration of bags within the shed and potential failure/release scenarios from bags during a significant flood event. However, to take into consideration the uncertainty in maximum % of product that could potentially be dissolved during a major flood event, a range of discharge quality/quantity and environmental conditions were considered by BMT WBM in their flooding impact assessment. Sensitivity simulations adopting higher dissolution of AN and subsequent release from the site was also completed. The impact of higher dissolved AN quantities on receiving water quality was discussed in the BMT WBM assessment.
Newcastle City Council				Loaded containers are highly unlikely to float considering they are normally loaded with between 20-24t net of product making gross weight 24–28t. As an emergency response measure the doors of any

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				empty containers would be opened allowing them to fill with water thereby eliminating their ability to float.
Newcastle City Council	10.08		According to the EIS, as a flood emergency response it is proposed to retrofit precast concrete doors to a height of three metre to the two openings at the front of sheds A & B. In addition, following notification from the emergency services of a 50 year (2%)or above flood event, other flood mitigation measures including encasing the store perimeters with a polythene construction membrane and constructing sandbagged dams adjacent to each vehicular access door will be carried out.	As noted in the EIS
Newcastle City Council	10.09		It is noted that the EIS does not contain any confirmation from BMT WBM that the proposed retrofitting works to the storage sheds and the flood mitigation measures will be adequate. Furthermore, it has not been demonstrated that during the minimum notification period of 18 hours for significant flood events sufficient time and trained staff will be available' to undertake the proposed flood measures prior to evacuation of the site. Bearing in mind the extreme weather conditions, including high winds, likely to be occurring at the time.	Refer to response provided above to Item #7. WBM have not considered the effectiveness of the retrofitting measures in their modelling. However as noted in other responses, the proponent has identified additional measures now to flood proof the structures that are proposed to be more effective than those proposed in the EIS. The emergency response plan has been developed to outline effective advanced planning and response actions and sufficient staff would be trained (and drilled) in such responses.
Newcastle City Council	10.10		Given the above circumstances, it is recommended that all ammonium nitrate be stored on site above the flood planning level of 4.3m AHD. This would necessitate modifications to the proposal.	For the reasons presented in the EIS and further expanded upon in this response to submissions the flood mitigation measures are considered adequate. Therefore the additional measure as recommended by Council of requiring all AN to be stored above the flood planning level is not considered practical, justified or warranted.
Newcastle City Council	10.11	**Air Quality Impacts**	The development involves a scheduled activity under the provisions of the Protection of the Environment Operations (POEO) Act 1997 (chemical storage) and will therefore require an Environment Protection Licence to be issued by the Environment Protection Authority (EPA). The EPA will be the Appropriate	Accepted. See submission from EPA that provide recommended conditions of approval

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			Regulatory Authority for all activities carried out on the premises for which the licence applies. Council will defer to the EPA to provide the detailed technical assessment of the proposal, given their far greater expertise and resources and ultimate responsibility as the ARA.	
Newcastle City Council	10.12		Council's review of this aspect of the proposal is limited to identifying and providing comment on any obvious general issues, areas where local government records and experience may provide particular insight, or where there is a specific local government responsibility.	See NCC submission
Newcastle City Council	10.13		In this regard, concern is raised regarding the potential increase in air quality impacts from dust generated by the proposed onsite operations. The two main areas of concern are the handling of ammonium nitrate and the movement of heavy vehicles onsite.	Both of these activities have been considered in the air quality modelling as a source of particulate emissions. Management measures are provided in Section 7.4 of the Air Quality Assessment in *Annex G* of the EIS.
Newcastle City Council	10.14		The current ammonium nitrate handling practices observed by Council officers generate a fine dust during the bulk loading of trucks. Council have been in receipt of air pollution complaints and community concern from the current onsite operations and recommend further mitigation measures or management practices be put in place to reduce particulate air emissions.	Recommendations for product storage and handling requirements are identified in the EIS.
Newcastle City Council	10.15		The generation of dust from the movement of heavy vehicles onsite is also an area of concern. The site is not currently sealed and truck movements have been observed by Council officers to create significant levels of airborne dust. The proposed controls outlined in the EIS are not considered to be permanent solutions to reduce dust emissions. The addition of large aggregate stones will become compacted or deteriorated over time with heavy vehicle movement and the previous dust issue is likely to return. It is recommended that the site be adequately sealed to reduce dust from vehicle movement on site. Appropriate sealing of the site will also assist in	Crawfords do not accept this recommendation and the modelling provided in the air quality assessment (see Annex G of the EIS) demonstrates that it is not required to achieve compliance.

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			controlling any sediment runoff during periods of wet weather.	
Newcastle City Council	10.16	**Traffic Impact**	The traffic consultant analysis of the performance of surrounding road network confirms operation within acceptable limits. Furthermore, it is understood Roads and Maritime Services has reviewed the application and support the proposal.	Noted.
Newcastle City Council	10.17		The operation of the traffic signals at the intersection of Old Maitland Road and Pacific Highway pre and post development has been analysed using SIDRA modelling. This analysis confirms that the signals will continue to operate at an acceptable level of service post development.	Noted.
Newcastle City Council	10.18		The proposal comprises the use of rail for the delivery of ammonium nitrate to the site from Sydney and thereby reduces road generated traffic despite the proposed increase in storage capacity from 200 tonnes to 13500 tonnes.	Noted.
Newcastle City Council	10.19		Under section 7.03 -'Traffic, Parking and Access' of the Newcastle Development Control Plan (DCP), 2012, onsite parking is required at 1 space per 2 staff. The existing parking provision of 61 spaces more than satisfies the requirement for parking in accordance with Council's DCP 2012.	Noted.
Newcastle City Council	10.20		A secure enclosure for the storage of a minimum of 3 bicycles (Class 2) is required in accordance with Council's DCP 2012.	Noted.
Hunter Water Corporation	11.01	**Nil**	No Objections to the proposed facility	Noted.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
ARTC	12.01	**Stormwater Management**	Stormwater drainage is not adequately addressed in the Environment Impact Statement. It is requested that additional information on the drainage design be provided to ARTC for further consideration. No additional stormwater should flow toward the rail corridor as a result of the proposal.	It is noted in Section 2.5.2 of Annex E of the EIS that "*No additional development is proposed that would result in surface runoff from the Site being increased above existing conditions. Although no additional surface runoff will be generated by the development, the development provides an opportunity to improve the way that stormwater is currently drained within the Site*." The proposed development will maintain the proportion of the site that currently drains to the railway. In addition, the development proposal does not incorporate any additional impervious area (ie roof area or paved roads). Therefore, the volume of runoff generated from the site areas draining to the railway land will be similar to existing conditions. Although, the provision of rainwater tanks with a total capacity of 320kL for capturing and using rainwater should significantly reduce the volume of runoff discharging from roof areas into the railway land. Minor surface grading is also proposed to minimise the overland discharge of surface runoff to the railway land. This minor regrading would re-direct surface flows to proposed stormwater treatment basins for the interception of sediment, nutrients and other stormwater pollutants. In addition to improving the runoff quality, it is envisaged that these basins will also assist with reducing the volume of stormwater discharged to the railway land. Capture of sediment in these basins is likely to also reduce the potential for blockage of the drainage pipes when compared to existing conditions.
ARTC	12.02		The proposed exclusion zone currently affects the railway corridor. This could shut down all operations and services on the Main Northern Railway. It is requested that the proponent investigate and provide appropriate mitigation measures to reduce the exclusion zone, to ensure that the Main Northern Railway cannot be adversely impacted.	The contours presented in the Hazard Analysis represent risk contours, not exclusion zones. These risk contours have been compared with the risk criteria presented in HIPAP No. 4. The calculated distance to various overpressures (including 7, 21, 35 and 70 kPa) based on each of the reported TNT equivalencies for the quantities of ammonium nitrate involved in an explosive event required by the NSW Department of Planning and Infrastructure,

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
				were presented in Attachment C of the Hazard Analysis submitted to NSW Department of Planning and Infrastructure. The Site Emergency Plan is in accordance with the requirements of Fire and Rescue NSW for Major Hazard Facilities.
Public Submissions				
Tanika Rigeway	13.01	**Human and Environmental Safety Risk**	The consequences of an ammonium nitrate accident are significant and pose a significant threat to people and the environment. The proposed store is:	The Hazard Analysis conducted by Health & Safety Essentials calculated societal risk based on the consequence and frequency analysis using the methodology required by DP&I. Consequences and impacts were determined for a range of accident scenarios. The Societal Risk graph (Fig 4.5 of EIS) shows that the calculated societal risk lies within the ALARP (As Low As Reasonably Practicable) region. Within the ALARP region, the emphasis is on reducing risks as far as possible towards the negligible line. Provided all other qualitative and quantitative criteria are met, Societal Risk is considered tolerable if within the ALARP region.
Tanika Rigeway	13.02	**Flooding Issues**	In flood prone location	The Flooding Risk Assessment conducted by BMTWMB identified that the site was at risk of inundation in a 1 in 100 year (1% AEP (Annual Exceedance Probability)) event and less extensively in a 1 in 50 year (2% AEP). In a 1% event flood depths across the site measure 1.0 m-1.8 m and in a 2% event flood depths across the site measure 0.1 m-0.4 m. This risk principally originates from floodwaters spilling over the Pacific Highway from the Hunter River into Hexham Swamp and wetlands. Hexham Swamp and wetlands would also be filled at its southern extents by flow backing up along Ironbark Creek from the Hunter River South Arm. The Site Management System and Site Emergency Plan developed by Proponent details protocols in the event of a flooding emergency (in advance of any flood warning received from the BoM for a 2% or 1% AEP), including restrictions on

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				the receipt and storage of AN, implementation of emergency response within each AN store including encasement of the entire internal perimeter of the store with polythene construction membrane, construction of lined internal seepage dams and sump pumps to pump pooled water to external yard areas, reconfiguration of AN stacks to remove segregation gaps and ensure no voids between individual flexible IBCs or bag stacks and walls.
Tanika Rigeway	13.03	**Proximity to Roads and Residences**	Very close proximity to major arterial roads (Maitland Rd, Shortland bypass)	The design and location of the storage sheds is in accordance with Proponent risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses. The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a demonstration that risk has been reduced to 'As Low As Reasonably Practicable'.
Tanika Rigeway	13.04		Close proximity to residential areas in Sandgate.	The design and location of the storage sheds is in accordance with Proponent risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in

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				relation to surrounding land uses. The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a demonstration that risk has been reduced to 'As Low As Reasonably Practicable'.
Tanika Rigeway	13.05		Close proximity to aged care facility.	The design and location of the storage sheds is in accordance with Proponent risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses.The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a demonstration that risk has been reduced to 'As Low As Reasonably Practicable'.
Tanika Rigeway	13.06		Will impact on the Shortland Wetland	The ecology assessment in *Annex F* describes 2HD swamp and wetlands in the immediate environs. 2HD Swamp is dominated by *Panicum repens* wet grassland with *Typha/Phragmites* reed swamp fringing the northern edge of 2HD Swamp and dominating drainage line to the north of the site. Exotic shrubs and grasses fringe the site and 2HD Swamp (see Figure 5.4 in Annex F). Within the immediate environs there are wetlands and estuarine communities associated with Ironbark Creek to the west of the Main

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				Northern Railway and north of the site, Shortland Wetlands Reserve approximately 500m to the southwest of the site, Market Swamp and Newcastle Wetlands Reserve approximately 500m to the south and 'Hexham Swamp' within the Hunter Wetlands National Park is to the north of Ironbark Creek. The proposed continuation of existing operations will not impact directly on these wetlands. There is potential for continuation of indirect impacts on 2HD Swamp and wetlands downstream of the site (to the east of the Main Northern Railway) associated with dispersal of AN in surface flows in particular during flooding events. However it is important to note that improvements in management of stormwater are predicted to improve water quality, including retaining and filtering stormwater runoff to reduce the concentrations and loads of stormwater pollutants discharging from the site to meet NCC thresholds.
Tanika Rigeway	13.07		Ammonium nitrate storage needs to be separated from normally daily activities because if an explosion occurs, many people will be killed and severely hurt. Also residential properties will be significantly damaged.	The design and location of the storage sheds is in accordance with Proponent risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses. The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a demonstration that risk has been reduced to 'As Low As Reasonably Practicable'.
Michelle	14.01	**Human Health**	Concern regarding fumes being emitted to the air causing health	An Air Quality Impact Assessment (AQIA) was prepared by ERM

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Mifsud		**Risk**	risk to neighbouring suburbs	(refer to *Annex G* of the EIS). The development is predicted to comply with the short term NSW EPA air quality impact criteria for PM_{10} at all receptors. The development is also predicted to comply with the long term NSW EPA air quality impact criteria for PM_{10}, TSP and dust at all receptors. The project would therefore have no significant impact on the long term air quality parameters of dust deposition, annual average PM_{10} and TSP. The EPA, in their review of the EIS, did not raise any issues relating to air quality impacts, providing recommended conditions of approval relating to dust minimisation.
Michelle Mifsud	14.02	**Soil Contamination**	Chemical will spoil the ground and surrounding areas	The site operates under a site specific environmental management plan developed and reviewed as part of the Major Hazardous Facility compliance process with WorkCover NSW. A Construction EMP and Operational EMP will be prepared / updated to include specific management and mitigation measures to control and prevent spills and associated clean up activities to minimise impacts on the ground and surrounding areas.
Michelle Mifsud	14.03	**Alternative Location**	Could consider using the BHP site	The suitability of alternative sites for the storage and distribution of AN is limited due to locational and safety criteria which must be satisfied. The current location of the site is ideal for the operations undertaken: • It is in close proximity to both the Port of Newcastle and the Port of Sydney – the two sources of imported ammonium nitrate. • It is on the rail line from Sydney and provided with a dedicated rail siding for off-loading of product. • It is in close proximity to the Hunter Valley mining area, where the bulk of the ammonium nitrate is used. Any alternative location would need to have similar characteristics, and therefore would likely have similar surrounding land uses, and achieve no significant reduction in risk. *Section 1.7.1* of the EIS details

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				alternative sites considered, including a site in Mayfield and a site in Belford. The Sandgate site, along with the alternative sites in Mayfield and Belford were assessed based on suitability criteria, including land availability and zoning, road network and traffic safety, site access and traffic safety, effective transportation logistics (including access to rail infrastructure to reduce road transport), sensitive landuses , conflicting landuses, site safety, product handling and security, access to infrastructure and services and access to skilled labour. Alternative site options were discounted for a variety of reasons including proximity to sensitive receivers and potential explosion risks, transporting product through congested and sensitive areas, noise impacts and incompatible land uses with regard to the consideration of AS 4326 and the policies of WorkCover NSW.
Cliff Gale - Downer EDI	15.01	**Support**	This letter is to support the application by Proponent Freightlines for an Ammonium Nitrate Storage and Distribution Facility at Old Maitland Road, Sandgate.There is a need for suitable ammonium nitrate storage in the Newcastle area with relatively close access to the Newcastle Port. Current facilities do not provide enough storage, or are restricted to the sole use of the owner of the facility.Regulations require AN to be moved from port precincts in a timely manner, and this is an important factor in selecting a suitable site, as well as assisting in mitigating port congestion by discharging cargos quickly. The site proposed by Proponent Freightlines meets these needs, as well as already being a current AN storage site which means a minimum of infrastructure is required. A rail siding is already in place, which reduces the need to move AN by road from Port Botany.Keeping truck movements in the Newcastle area to a minimum is important, and it is felt that this location will assist in this. A centralised storage facility that can store AN for more than one party allows AN to be moved	Noted.

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			efficiently and cost effectively within the Hunter region. The movement and storage of AN is strictly controlled, and the mining industry will always require a supply of AN to operate. Having a single, centralised, storage operation allows a focussed regulatory control over AN storage and movements. Having a number of small sites scattered over a large area is less than desirable.	
Christina Clegg	16.01	**Environmental - Wetlands**	As regular visitors to the wetlands surrounding Sandgate with our young family we have serious concerns around the safety and the environment with the proposed storage of such a significant amount of explosives.	Noted. The EIS considered potential impacts on surrounding landuses and the environment.
Christina Clegg	16.02		Why can this product not be stored closer to the end user and in areas that afford more appropriate storage.	The suitability of alternative sites for the storage and distribution of AN is limited due to locational and safety criteria which must be satisfied. The current location of the site is ideal for the operations undertaken: • It is in close proximity to both the Port of Newcastle and the Port of Sydney – the two sources of imported ammonium nitrate. • It is on the rail line from Sydney and provided with a dedicated rail siding for off-loading of product. • It is in close proximity to the Hunter Valley mining area, where the bulk of the ammonium nitrate is used. Any alternative location would need to have similar characteristics, and therefore would likely have similar surrounding land uses, and achieve no significant reduction in risk. *Section 1.7.1* of the EIS details alternative sites considered, including a site in Mayfield and a site in Belford. The Sandgate site, along with the alternative sites in Mayfield and Belford were assessed based on suitability criteria, including land availability and zoning, road network and traffic safety, site access

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
				and traffic safety, effective transportation logistics (including access to rail infrastructure to reduce road transport), sensitive landuses , conflicting landuses, site safety, product handling and security, access to infrastructure and services and access to skilled labour. Alternative site options were discounted for a variety of reasons including proximity to sensitive receivers and potential explosion risks, transporting product through congested and sensitive areas, noise impacts and incompatible land uses with regard to the consideration of AS 4326 and the policies of WorkCover NSW.
Christina Clegg	16.03		This is a short term gain to a company now and a possible long term loss to future generations of wetland users. Storage facilities for ammonia nitrate can be built in many places - wetlands can not!	The receiving waters of the wetlands, both surface water and groundwater, have been contaminated by historical uses of the site and immediate environs. Proposed improvements in stormwater management and house-keeping of the site have been modelled as improving water quality of the receiving waters (see *Annex E*). Further, the proposed improvements in buildings will serve to flood proofing reducing risk of dispersal of AN in flood waters and predicted deleterious impacts on receiving waters.
Anonymous 1	17.01	**Residential Proximity**	Close to St Jospeph's Nursing home and housing	The design and location of the storage sheds is in accordance with Proponent risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses.The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
				demonstration that risk has been reduced to 'As Low As Reasonably Practicable'.
Anonymous 1	17.02	**Flora and Fauna**	Concern regarding impact on flora and fauna within the wetlands and waterways	Potential impacts on flora and fauna were considered as part of the EIS (refer to Section 5.5 and *Annex F of the EIS*).
Anonymous 1	17.03	**Public Safety**	Concerns regarding limited opportunity for evacuation given nearby service stations and businesses storing volatile paints and gases	Emergency planning is considered in Section 4.3.4 of the EIS. The proponent has developed a Site Emergency Plan in accordance with the requirements of HIPAP No. 1 (DoP, 2011). The Site Emergency Plan (Proponent, 2011) has been reviewed by NSW Fire and Rescue.
Anonymous 1	17.04		Storage of AN in containers based on the high temperatures potentially reached inside said containers	See comment above.
Anonymous 1	17.05	**Community Consultation**	Disappointed that letter was not received by all local residents.	The EIS was publically exhibited between 6th February 2013 and 11th March 2013 at DP&I offices in Sydney and Newcastle, NCC Administration centre, Natural Conservation Council and was also available on DP&I's website.
Anonymous 1	17.06	**Environmental Risk**	Concerns regarding irreversible damage to the environmental should a leak occur	Environmental risk and impacts on the surrounding environments were considered in the EIS, specifically in Chapter 4.
David Horkan	18.01	**Residential Proximity**	The site is situated within a few hundred metres of the nearest residence, and very close to an aged care facility and retirement village.	The design and location of the storage sheds is in accordance with Proponent risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning –

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				Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses. The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a demonstration that risk has been reduced to 'As Low As Reasonably Practicable'.
David Horkan	18.02	**Public Safety**	In the event of an explosion the consequences would be potentially catastrophic and for a lesser incident evacuation would be difficult.	A Hazard Analysis was completed as part of the EIS (refer to Section 4.3). Emergency planning is considered in Section 4.3.4 of the EIS. Proponent have developed a Site Emergency Plan in accordance with the requirements of HIPAP No. 1 (DoP, 2011). The Site Emergency Plan (Proponent, 2011) has been reviewed by NSW Fire and Rescue.
Yara	19.01	**Support**	Complete control of a secured substance (Customs to Proponent) in a controlled environment	Noted.
Yara	19.02		As transport is on rail Ammonium Nitrate is kept off Sydney and Newcastle roads	Noted.
Yara	19.03		Ammonium Nitrate is kept out of populated areas	Noted.
Yara	19.04		It is stored at a specialised site with personnel appropriately trained in secure handling and storage of Ammonium Nitrate	Noted.

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St Josephs and Residents	20.01	**Noise and Air Pollution**	Increased noise and dust from increase in vehicles in the street	A Noise and Vibration Impact Assessment (NVIA) (refer to *Annex I* of the EIS) and an Air Quality Impact Assessment (AQIA) (refer to *Annex G* of the EIS) were prepared by ERM to assess noise and air quality impacts on the surrounding environment from the proposed AN storage and distribution facility. The project would have no significant impact on the long term air quality parameters of dust deposition, annual average PM10 and TSP. Negligible (low) operational noise impacts are anticipated during daytime operations, negligible (low) to moderate impacts are anticipated during evening operation, and negligible (low) to moderate impacts are anticipated during morning shoulder period operations. Any predicted exceedances are limited to one receptor (R8) located close and north of the site. At this location negligible (low) to moderate impacts are anticipated. High or significant impacts are not anticipated. During construction, negligible (low) impacts are anticipated during normal construction works and negligible (low) to moderate impacts are anticipated during worst-case construction activity.
St Josephs and Residents	20.02	**Water Quality**	Drainage and other liquid pollution has not been addressed	A Stormwater, Flooding and Receiving Water Quality Assessment was undertaken BMT WBM Pty Ltd for the proposed AN storage and distribution facility (refer to Section 5.3 of the EIS and *Annex E*). The assessment considered drainage and stormwater runoff and management at the site.
St Josephs and Residents	20.03		Run-off into the adjacent wetland	See above.
St Josephs and Residents	20.04		Spillage and Contamination during product transfer	The site operates under a site specific environmental management plan developed and reviewed as part of the Major Hazardous Facility compliance process with WorkCover NSW. A Construction EMP and Operational EMP will be prepared / updated to include specific management and mitigation measures to control and prevent spills

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				and associated clean-up activities to minimise impacts on the ground and surrounding areas.
St Josephs and Residents	20.05	**Public Safety**	Chemical Decomposition, Diesel Fuel and Forklift Gas Bottles are hazardous	A HAZMAT assessment was undertaken as part of the EIS (Section 4.5) which identifies hazardous materials stored at the facility and management measures to be implemented.
St Josephs and Residents	20.06		Vandalism is prevalent, with no 24 hour surveilence - could lead to explosion	The site is secured against unauthorised access, and a Site Security Plan has been prepared and reviewed by Inspector Marilyn Hamilton, the NSW Police representative on the WorkCover Major Hazard Facilities team.
St Josephs and Residents	20.07		Although explosion unlikely, if such an event were to occur, the result would be horrific.	A Hazard Analysis conducted by Health & Safety Essentials (refer to Section 4.3) calculated risk based on the consequence and frequency analysis using the methodology required by DPI. Consequences and impacts were determined for a range of accident scenarios.
St Josephs and Residents	20.08		No confidence that tonnage will be kept to permissive levels	Crawfords are bound by limitations imposed by regulators and is subject to regulatory audit and review.
St Josephs and Residents	20.09		Threat posed in the event of a bushfire	A Bush Fire Hazard Assessment (BFHA) was undertaken by ERM (refer to *Annex K* of the EIS). The methodology of the BFHA addresses the matters listed in Clause 44 of the Rural Fires Regulation 2008 and Planning for Bushfire Protection Guidelines (NSW RFS 2006). The BFHA found that the development can be managed to provide acceptable bushfire protection measures such that it meets the aims and objectives of Planning for Bushfire Protection and minimises the risk of spread of fire to the nearby wetlands. This is due to the adequate site infrastructure, the size of the site's Asset Protection Zones/defendable space, the lack of site vegetation and access to the site.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
Anonymous 2	21.01	**Flood Risk**	The EIS discusses, at length the various, flood scenarios. The risk analysis argues that the risk posed to the ammonium nitrate and the impacts on the connected water systems are acceptable.	Within the Hazard Analysis, consequences and impacts were determined for a range of accident scenarios. These results have been combined with the likelihood of occurrence for each event based on the approach required by DP&I. The resulting contours for individual fatality risk, injury risk (explosion overpressure and toxic exposure) and risk of property damage and accident propagation have been determined, consistent with the approach required by DP&I.
Anonymous 2	21.02		All risk calculations are a prediction based on the best knowledge at the time. Risk management strategies mandate that risk should be eliminated as a first pass. In the year 2013, we as a society, should not be allowing dangerous goods developments to occur within a flood prone location, particularly with the apparent ongoing changes to climate patterns.	See above.
Anonymous 2	21.03		Furthermore, the flood prone location neighbours a Ramsar wetland and a broad application of the precautionary principle leads to a rejection of this proposal.	The Hunter Estuary Wetlands Ramsar site comprises the Shortland Wetlands Centre (now called Wetlands Centre Australia), approximately 500m to the southwest of the site (west of the Newcastle Inner City Bypass Shortland to Sandgate section that is currently under construction), and the Kooragang Wetlands on Kooragang Island that form part of the Hunter Wetlands National Park. The proposal will not impact directly or indirectly either parts of the Hunter Estuary Wetlands Ramsar site. The impact assessment within the EIS includes an assessment of the project's potential impact on surrounding receptors, including wetlands. It also assesses the project against the precautionary principle (Section 8.1.1).
Anonymous 2	21.04		The risk posed by the impact of fire water onto the local ecosystem has not been considered. A fire involving ammonium nitrate or the thermal decomposition of ammonium nitrate, are treated with the application of large amounts of water in order to cool the ammonium nitrate. Ammonium nitrate will dissolve in this water and no analysis has been provided on this scenario. Should one of	In the event of a fire, the stormwater management system would be able to provide storage capacity to capture fire water runoff. Any contaminants could then be assessed and managed post fire to reduce risk to offsite receivers.

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			these events occur, the quantity of dissolved ammonium nitrate will be significantly greater than the 40 – 50 tonnes of dissolved ammonium nitrate modelled in the EIS.	
Anonymous 2	21.05	**Threatened Species Impact**	The Threatened Species analysis, provided in the EIS, focuses on water and ecosystem impacts from ammonium nitrate contamination. The risk posed by an ammonium nitrate detonation is not considered.	The detonation risk posed by the ammonium nitrate stored at the site which assessed as 'highly unlikely' has been considered in the Hazard Analysis (see Attachment E in *Annex B*). Analysis of risk to biophysical environment was provided in *Section 13* of *Annex B in water quality modelling in* Annex E and the ecology assessment in *Annex F*. The analysis in Annex B concluded that the proposal met the criteria for the biophysical environment as listed on page 87 of the EIS (Vol I).
Anonymous 2	21.06		The risk of killing threatened species and / or the loss of threatened species habitat via a detonation are silent in the EIS.	See above
Anonymous 2	21.07		The storage of ammonium nitrate in close proximity to a Ramsar wetland is totally unacceptable.	The Hunter Estuary Wetlands Ramsar site comprises the Shortland Wetlands Centre (now called Wetlands Centre Australia) and the Kooragang Wetlands on Kooragang Island (previously known as Kooragang Island Nature Reserve) that form part of the Hunter Wetlands National Park. The Shortland Wetlands Centre is approximately 500m to the southwest of the site (west of the Shortland to Sandgate bypass under construction) and upstream of the site. The Kooragang Wetlands are associated with the north arm of the Hunter River and are bounded in the south by the Kooragang Island Branch Line (railway). The Kooragang Wetlands do not include the bed of the southern channel of the Hunter River, into which Ironbark Creek drains. The proposal is unlikely to have direct or indirect impacts on either parts of the Hunter Estuary Wetlands Ramsar site.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
Anonymous 2	21.08	**Detonation & Overpressure Risk**	The detonation risk posed by ammonium nitrate is the greatest perceived risk.	The detonation risk posed by the ammonium nitrate stored at the site has been considered in the Hazard Analysis.
Anonymous 2	21.09		Low risk storage of ammonium nitrate essentially requires two control measures: a. Prevent the thermal decomposition of ammonium nitrate, and b. Should a detonation occur in one stack / store, prevent it from propagating to a neighbouring store.	Ammonium nitrate decomposition and explosion has been included in the Hazard Analysis. AS4326 and ammonium nitrate storage licensing requirements of NSW WorkCover allow for the storage of up to 500 tonnes of ammonium nitrate in a stack, with stacks separated by 3m. In the Hazard Analysis, alternative views on stack separation have been presented in Section 4.2 (Safe storage of ammonium nitrate, Australian Standards and Codes of Practice) and Section 4.3 (Safe storage of ammonium nitrate, International Standards and Codes of Practice) of *Annex B*. Uncertainty regarding the appropriateness of the separation distances specified by SAFEX arises from a review of the publicly available research papers on which these separation distances are based, and the lack of acceptance of the SAFEX guidance by regulators (WA are the only regulators world-wide who appear to have adopted the SAFEX separation distances). The methodology adopted for the Hazard Analysis considered potential incidents involving up to 2,500 tonne of ammonium nitrate, not one stack of 500 tonne. This was the methodology required and accepted by the NSW Department of Planning and Infrastructure, and is in accordance with the methodology presented in SAFEX.
Anonymous 2	21.10		To achieve 9b, the energy from a detonation needs to be redirected, absorbed or dissipated so that the energy impacting a neighbouring store / stack is below the energy of detonation. The most common method to achieve this is through physical separation.	Refer to response to Anonymous 2 Comment No. 9.
Anonymous 2	21.11		The status of what is sufficient separation is not set in stone. Different jurisdictions have different views.	Refer to response to Anonymous 2 Comment No. 9.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
Anonymous 2	21.12		In section 4.3.4 of the Hazard Analysis Revision 4 (EIS Volume II) reference is made to the paper written by Eric Nygaard, Storage of Technical (Porous) Ammonium Nitrate, in which separation distances are set at 16m (this being for 500 tonne stacks stacked in a traditional block configuration). The EIS argues that this distance is not applicable to this development proposal and on this matter they are in error.	Refer to response to Anonymous 2 Comment No. 9.
			a. The experimental data that lead to Eric Nygaard's conclusions was based on ammonium nitrate manufactured by Yara International. The EIS states: *"it is unclear as to whether the experimental research is directly applicable to the types of products and storage conditions in Australia".* This conclusion is quite interesting since Photograph 1.4 on page 17 of EIS Volume I shows a Yara International ammonium nitrate bag being transported at the proposed development. The ammonium nitrate to be stored at the proposed development will react in the same manner as the ammonium nitrate used in Eric Nygaard's experiments.	Refer to response to Anonymous 2 Comment No. 9.
			The SAFEX guidance material, which is based on Eric Nygaard's conclusions, has been adopted by the Western Australian Department of Mines and Petroleum in the 2nd edition of the Code of Practice - Safe storage of solid ammonium nitrate[1]. The EIS states that the 1st Edition of this code (Section 4.2.4 of the Hazard Analysis Revision 4) is the latest but this is untrue. The 2nd Edition was published in 2012 and should have been correctly referenced in the EIS.	Refer to response to Anonymous 2 Comment No. 9.The 2nd edition of the WA Code of Practice was released in mid-2012. Revision 3 of the Hazard Analysis was completed in early-2012 and therefore referenced the then current 1st edition of the WA Code of Practice. Changes to the Hazard Analysis between the 3rd and 4th Revision were to address the requirements of NSW Department of Planning and Infrastructure in relation to the methodology for calculating risk. These requirements were based on the SAFEX Good Practice Guide, on which the 2nd edition of the WA Code of Practice is based. Unfortunately, updating the report to include reference to the 2nd edition of the WA Code of Practice was overlooked at that time. For correctness, paragraph 2 of Section 4.2.4 (Safe storage of ammonium

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<tr><th>Authority/ Author</th><th>ERM Ref</th><th>Issue Raised</th><th>Submission</th><th>Response</th></tr>
<tr><td></td><td></td><td></td><td></td><td>nitrate, Australian Standards and Codes of Practice, Western Australia) should be deleted and reference made to the separation distances required by the SAFEX Good Practice Guide. No other corrections would need to be made to the Hazard Analysis.</td></tr>
<tr><td>Anonymous 2</td><td>21.13</td><td></td><td>With stack separation distances being less than the latest industry endorsed guidance, the assumption that only half a stores quantity will be involved in a detonation is a poor assumption. Detonation modelling has been understated.</td><td>The methodology adopted, including the assumption that half-a-store is involved in an explosive incident, was the methodology required and accepted by the NSW Department of Planning and Infrastructure and is in accordance with the methodology presented by SAFEX.</td></tr>
<tr><td>Anonymous 2</td><td>21.14</td><td>Detonation – Individual Fatality Risk</td><td>Using 4500 tonnes and a TNT equivalence of 32%, the resulting overpressures are expected at the following distances from the store:
<table><tr><th>Over Pressure (kPa)</th><th>Probability of Fatality</th><th>Contour Distance (SAFEX)</th></tr><tr><td>70</td><td>100%</td><td>451m</td></tr><tr><td>35</td><td>50%</td><td>678m</td></tr><tr><td>21</td><td>20%</td><td>903m</td></tr><tr><td>7</td><td>0%</td><td>2010m</td></tr></table>Table 1: Overpressure vs Distance Comparison
The overpressure contours provided in the EIS are underestimated.</td><td>The contours presented in the Hazard Analysis represent "risk" not "consequence". No overpressure consequence contours are presented in the Hazard Analysis.
The calculated distance to various overpressures (including 7, 21, 35 and 70kPa) based on each of the reported TNT equivalencies (including 32%) for the quantities of ammonium nitrate involved in an explosive event required by the NSW Department of Planning and Infrastructure, were presented in Attachment C of the Hazard Analysis submitted to NSW Department of Planning and Infrastructure.</td></tr>
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<tr><td>Anonymous 2</td><td>21.15</td><td></td><td>With the overpressure contours being underestimated in the EIS, the subsequent Individual Fatality Risk contours are also underestimated. The distances to nearby premises and facilities provided in the HSE Study are extracted in Table 2.
<table><tr><th>Premises</th><th>Distance (m)</th></tr><tr><td>Scafflink</td><td>60</td></tr><tr><td>Golf Range</td><td>120</td></tr><tr><td>Caltex Service Station</td><td>350</td></tr><tr><td>Sandgate Residential</td><td>440</td></tr><tr><td>St Joseph’s Home</td><td>580</td></tr></table>Table 2: Distance to Neighbours</td><td>The contours presented in the Hazard Analysis represent "risk" not "consequence". No overpressure consequence contours are presented in the Hazard Analysis.
The methodology adopted, including the calculation of Individual Fatality Risk, was the methodology required and accepted by the NSW Department of Planning and Infrastructure.</td></tr>
<tr><td>Anonymous 2</td><td>21.16</td><td></td><td>Without going into detailed calculations, a comparison of Tables 1 and 2 indicates that the likely Individual Fatality Risk at all of these locations will exceed the HIPAP No.4 suggested criteria.</td><td>Table 1 in this response by Anonymous 2 represents consequence distances, not individual fatality risk.
The methodology adopted, including the calculation of consequences distances and Individual Fatality Risk, was the methodology required and accepted by the NSW Department of Planning and Infrastructure.</td></tr>
<tr><td>Anonymous 2</td><td>21.17</td><td></td><td>The storage of ammonium nitrate at the proposed Proponent development is not “As Low As Reasonably Practicable”.</td><td>The facility will be regulated as a Major Hazard Facility (MHF) by NSW WorkCover and the storage of ammonium nitrate will be licensed by NSW WorkCover. It is the proponent's understanding that the proposed storage arrangements meet current ammonium nitrate licensing requirements. As a MHF, the proponent will be required to submit a Safety Report (also known as a Safety Case) which demonstrates that risk has been reduced so far as is reasonably practicable. The proponent is working with, and will continue to work with, NSW WorkCover to ensure that ammonium nitrate licensing and MHF requirements are met.</td></tr>
</table>

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
Anonymous 2	21.18		Supporting the preceding analysis is Table 4.1 in the Western Australian Code of Practice. Based on increased separation distances, this code still recommends that a separation (for a 500 tonne stack) of 890m is required to "Off-site protected works" and a distance of 1,110m to "Vulnerable facilities and critical infrastructure".	The distances presented in the WA Code of Practice represent consequence distances, not distances to specific levels of risk. In NSW, the approach adopted for land-use planning is to calculate risk levels (taking into account both consequences and likelihood), and compare these against the criteria presented in HIPAP No. 4. For ammonium nitrate storage licensing in NSW, compliance with the separation distances presented in the 2005 edition of AS 4326 has been required.
Anonymous 2	21.19		The definition of a "protected works" is: These are deemed to include a dwelling, public building, place of worship, theatre, cinema (or other building or structure where the public is accustomed to assemble), shop, factory, warehouse, store, building in which any person is employed in any trade or business, store for the keeping of dangerous goods.	Refer to response provided to Anonymous 2 Comment No. 18.
Anonymous 2	21.20		The definition of a "vulnerable facility" is: A category of facility that includes, but is not restricted to, multistorey buildings (eg above four storeys), large-glass fronted buildings of high population, health care facilities, childcare and aged care facilities, schools, major traffic terminals (eg railway stations and airports), major public utilities (eg gas, water and electricity works) and sports stadiums.	Refer to response provided to Anonymous 2 Comment No. 18.
Anonymous 2	21.21		Off-site protected works within 580m of the proposed development include: Sandgate residential dwellings Caltex Service Station (which is a dangerous goods store) Sandgate Industrial Area Mullane Plumbing Sibelco mineral processors	Refer to response provided to Anonymous 2 Comment No. 18.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
Anonymous 2	21.22		Vulnerable facilities within 1,110m of the proposed development include: a. St Joseph's Aged Care Facility b. Sandgate Railway Station	Refer to response provided to Anonymous 2 Comment No. 18.
Anonymous 2	21.23	**Detonation - Property Risk**	Further to the individual fatality risk the property damage risk is unacceptable.	The risk contour for property damage and accident propagation is presented in Figure 8 of the Hazard Analysis and meets the criteria specified in HIPAP No. 4.
Anonymous 2	21.24		HIPAP No.4 (Table 7) estimates that houses become unrepair at an overpressure of 35kPa.Under the proposed storage configuration the 35kPa contour is approximately 678m. At this distance most of the residential buildings to the north east of the facility (opposite St Joseph's) will be destroyed should a detonation occur. Also many of the residential buildings to the south east (near the railway station) are likely to be destroyed.	The 678m distance presented in this response by Anonymous 2 represents a consequence distance. In NSW, the approach adopted for land-use planning is to calculate risk levels (taking into account both consequences and likelihood, not just consequences), and compare these against the criteria presented in HIPAP No. 4.
Anonymous 2	21.25		Also within the 35kPa contour is St Joseph's Aged Care Facility, indicating that this facility is at risk of irreparable damage.	Refer to response provided to Anonymous 2 Comment No. 24.
Anonymous 2	21.26	**Detonation - Other**	The proposed storage facilities contain asbestos. Should a detonation occur the surrounding area (residential, aged-care and wetlands) will be exposed to asbestos fibres. A new ammonium nitrate storage facility cannot be constructed of asbestos.	Crawfords have advised that the owner of the site has agreed to remove all asbestos from existing buildings.
Anonymous 2	21.27		The proximity of the development to the Maitland Rd and Shortland bypass arterials is unacceptable. The potential loss of life should a detonation occur during peak traffic periods has not be considered and is a significant oversight.	In NSW, the approach adopted for land-use planning is to calculate risk levels (taking into account both consequences and likelihood, not just consequences), and compare these against the criteria presented in HIPAP No. 4.
Anonymous 2	21.28	**Historical Use**	The notion that the facility has been in operation for many years and no incidents have occurred must not be entertained as a valid consideration.	The historical use of the site for the storage of AN is considered a relevant factor when assessing this development application. The site has been licenced by NSW WorkCover since 2000 for the storage of AN and as documented in the EIS there has not been a major incident on site in the past 13 years.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
Anonymous 2	21.29		The use of the land for ammonium nitrate has been unlawful. A development application for ammonium nitrate storage was made to Newcastle City Council in the year 2000 by the land owner, Sierra Sun. This application was rejected; however, the land owner allowed unlawful use and has profited from this.	This development application has been lodged as Crawfords were unaware until 2011 that the storage of AN on site did not have all the necessary approvals. Once this was recognised steps were taken immediately to begin preparation of this development application.
Anonymous 2	21.30		The Newcastle City Council saw fit to reject the application 13 years ago. The societal standards have increased since that time, evidenced by the enactment and implementation of Major Hazard Facility legislation. The land was unsuitable then and is even more unsuitable today.	It is ERM's understanding that Council refused the development application lodged in 2000 because it was not substantiated by appropriate supporting documentation. Notwithstanding the reasons for refusal of the original development application, this current development application must be assessed on its merits, not on the basis of a historical decision 13 years ago.
Anonymous 2	21.31		The proposed development should be considered as a Greenfields site and assessed appropriately.	The development application relates to existing buildings and an established industrial site. It is not a greenfield site as this term normally refers to an undeveloped site without services and infrastructure.
Anonymous 2	21.32	**"Conclusion"**	The proposed Proponent ammonium nitrate storage facility is attempting to use old infrastructure to provide substandard ammonium nitrate storage. There are suitable locations within the Newcastle and Hunter Valley region that provide adequate separation distances, free of flood risk and not adjacent to a Ramsar wetland. The opportunity now exists to establish a modern standard for the storage of ammonium nitrate in NSW.	Refer to responses to concerns raised regarding alternative locations and impacts on the wetlands, in particular the Ramsar wetlands throughout this table.
Tony Richards	22.01	**Public Safety**	AN, without additives, is just an oxidising agent. However, a 1tonne bag of AN can more easily be turned into an explosive (fuel oil, plus a detonator and booster) than a fertiliser, (thousands of litres of water – well mixed) which is its other main purpose. Some of the examples of explosions listed in the submission and in Attachment 1 (provides a list of 25 explosions worldwide from 1918 to 2009) of the submission are summarised below: - small quanitity of AN product (approximately 2560 tonnes of AN)	Section 4.1.1: (Safe storage of ammonium nitrate, Types of ammonium nitrate, Dangerous goods classification) of the Hazard Analysis confirms the classification of the ammonium nitrate as dangerous goods Division 5.1 (oxidising agent). Section 3.1.1: (Hazards of ammonium nitrate, Key hazards of ammonium nitrate, Explosion) considers the conditions required for an explosive event involving ammonium nitrate. The potential for explosive events, although highly unlikely, has been

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
			would produce expolsion equivalent to largest (not nuclear test) blast in Australia's history. This is less than amount expected to be stored in facilty; - worst industrial accident in US history occurred in Texas City in 1947 and resulted from apparent spontaneous combustion of 2300 tonnes of AN; - not one of the accidents listed in Attachment 1 involved AN being properly mixed as an explosive. All involved inadvertent contact between AN and some other catalyst be if fire, fuel oil, impact, contamination or unknown sources. For AN to detonate it does NOT need to be properly mixed as an expolsive. Some of the accidents occur with AN in crudest form as a powdered fertilizer, and sometimes in its prilled state as it iwll be stored by Proponent. AN is more volatile in a prilled state as that configuration is designed to hold oxygen so that it may intensify the effect of an explosion.	considered in the Hazard Analysis. For a person to be handling explosive materials (eg detonators, boosters) they must be licensed under the NSW Explosives Act 2003.
Tony Richards	22.02		Some of the areas of concern for any plant and stockpile of AN include regarding the potential for ignition include:-Fire in a conveyor or fixed equipment, such as Proponent' auger;-Fire in a piece of moving equipment, such as Proponent' loaders or trucks or their forklifts;-Terrorist incursion;-Disgruntled employee or disturbed member of the public gaining access;-Lightning strike; and-Earthquake.	Refer to Section 6 (Hazard identification) and Section 16.2 (Management Systems and Plans, Emergency plan) of the Hazard Analysis:- Ammonium nitrate explosion in the auger has been included in the Hazard Analysis (Incident Reference 3).- Ammonium nitrate decomposition and explosion involving trucks has been included in the Hazard Analysis (Incident Reference 2 and 5).- Lighting risk has been managed according to AS/NZS 1768.- Security breach (sabotage / vandalism) has been considered in the Hazard Analysis. Site security is in accordance with the requirements of NSW Police. - Earthquakes are covered in the Site Emergency Plan.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
Tony Richards	22.03		Annex A-D2 Section 16 Management Systems and Plans correctly identifies "that any uncontrollable situation requires evacutaion". Proponent have not provided a proper evacuation plan for the residents or visitors of the nearby Nursing Home, the residential areas, the Golf driving range, the highway running past their storage area, or the visitors to the cemetery as shown in their Figure 1.4.3 Surrounding Land Uses. It is important to point out that whether accidental, or deliberate tampering with AN is performed, the intensity of any blast could have devastating consequences for the residents or visitors shown in Figure 1.4.3 Surrounding Land Uses at positions 1, 6, 9, 5 and 7.	The Site Emergency Plan is in accordance with the requirements of Fire and Rescue NSW for Major Hazard Facilities. Consultation with nearby facilities has been conducted.
Tony Richards	22.04		A worst case scenario of a 13,500 tonne blast in the suburb of Sandgate is the destruction of the suburb with countless deaths and injuries. However, any smaller accident that leads just to destruction of the storage plant has the potential to spread environmental contamination to the surrounding area. The suburbs of Newcastle could be exposed to clouds, extremely harmful to health, of Nitric Acid, Nitrogen Oxide, Ammonium gas, and Nitrogen Dioxide, just to name a few.	The release and dispersion of ammonium nitrate decomposition products has been considered in the Hazard Analysis (Incident Reference 4 and 5). The risk of injury and irritation due to toxic gas release are shown in Figure 7 of the Hazard Analysis and meet the criteria set in HIPAP No. 4.
Tony Richards	22.05		If any truck is involved in a serious accident (roll over or fire) the load converts to a classification of 1.5 Explosive because of contamination by fuel oil, combustible material on the truck such as timber, plastic in truck wiring, or even the seating in the truck cab. The ERG (Emergency Response Guidelines) dictate that a fire in contaminated AN is NOT to be fought and that evacuation is the correct response. Any fire-fighter will confirm their concerns about the dangers involved with fire on any truck with an AN load.	Refer to Section 6 (Hazard identification) and Section 16.2 (Management Systems and Plans, Emergency plan) of the Hazard Analysis: - Ammonium nitrate decomposition and explosion due to truck fires has been included in the Hazard Analysis (Incident Reference 2 and 5). - Major transport incidents (an incident involving ammonium nitrate due to a site vehicle or equipment fire, an external road or rail transport incident in the vicinity of the site, or any incident involving the nearby rail infrastructure) is covered in the Site Emergency Plan.

Authority/ Author	ERM Ref	Issue Raised	Submission	Response
Tony Richards	22.06	**Storage Handling**	Failure by the applicant to address requirements of AS4326 (The storage and handling of oxidising agents),	Recommendations for product storage and handling requirements as identified in the EIS and Hazard Analysis (*Annex B*) have taken into consideration of the requirements of AS4326 as required by NSW WorkCover.
Tony Richards	22.07		Proponent EIS states a desire to store in Shed A a total of 4,500 tonnes of AN. Their proposal for Shed B is to store 3,500 tonnes indoors. They also state in their Proposal Overview at 1.3.2, that "Until late 2011 Impact Fertilisers Pty Ltd occupied Sheds A and B where they stored and distributed bulk fertilizer".‖ As that fertilizer would have been a high density FGAN product, there is every likelihood that the timber walls of Sheds A and B were previously contaminated by AN dust. Although their EIS states that they intend to carry out "treatment of existing timber panelling to a height of 3 metres on the inside and outside of the buildings with reinforced concrete" it is possible that they are merely covering up already contaminated combustible material. If Proponent are genuine in wanting to establish ALARP safety practice they would remove the timber walls and replace them with metal rather than cover them up.	The fertilizer stored by Impact Fertilizers was not ammonium nitrate. The timber walls of Shed A and Shed B are to be sealed prior to storage of ammonium nitrate. This will prevent any ingress of ammonium nitrate into the timber structure.
Tony Richards	22.08		Proponent EIS states "AS4326 Storage requirement (4.2.1) • In stores where there is a risk of corrosion, electrical installations should have a rating of not less than IP 65."‖ Under their Section 5.1 Buildings and storage areas it also states "Existing electrical installations are not IP 65 rated". Although it goes on to say "no evidence of corrosion is apparent even after storage of ammonium nitrate in some sheds for several years", that is a statement that must be questioned. Part of Proponent EIS states under 4.5.2 Potential Impacts "Old style fluorescent lighting was observed during the survey...Identification of PCB Containing Capacitors database (1997) did not state either way whether the	The stores are used for storage only - bags will not be opened in the stores and no transfer of ammonium nitrate will be conducted in the stores. Corrosion risks are present when ammonium nitrate dust is generated. All opening of bags and transfer of ammonium nitrate will be conducted outdoors.

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			lights contain PCB. These were unable to be assessed due to height restrictions however, due to their age are considered to be likely to contain PCBs.‖ The point of that quote is to question just how thorough the investigation into electrical contamination and corrosion was assessed in Sheds A, B and C? Was the ceiling electrical wiring to the lights in those sheds —too high" to check for contamination and/or corrosion? Plastic coating of electrical wiring is easily contaminated by AN. Failure to properly assess electrical wiring safety is a potential fire hazard.	
Tony Richards	22.09		Subclass 5.1 of the ADG Classification Code, while referring to Ammonium Nitrate, states: —oxidising agents; substances which, although not necessarily combustible, may readily liberate oxygen, or be the cause of oxidisation processes. As a result they may start a fire in other materials or stimulate the combustion of other materials thereby increasing the violence of a fire." The timber wall linings in Sheds A and B, and the electrical systems in Sheds A, B, and C, all listed for storage of AN in Proponent' application may already be contaminated by the previous storage of both AN and other combustibleproducts. Covering up possible contamination with shotcrete, or ignoring possible contamination because it is difficult to reach or check, is not a sufficient response to adhering to AS4326 (The storage and handling of oxidising agents).	Refer to responses provided to Tony Richards Comment Nos. 7 & 8.
Tony Richards	22.10	**Risk of Contamination and Accidental Blast**	an underestimation on the risk from contamination and accidental blast in their storage area	
Tony Richards	22.11		I have a real concern that Proponent have been extremely conservative with the information in their EIS about the risk zone to persons and property from any accidental, or deliberate, blast from within their plant.	In the context of a hazard analysis, "conservative" has the meaning of over-estimating the results, ie the actual consequences, frequency or risk are likely to be less than those calculated. It is an approach that is generally adopted to address uncertainties.

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			When Proponent use the term 'conservative' they are referring to overestimating the dangers, where I refer to 'conservative' as a substantial underrating of the dangers. Although Proponent propose to store, as opposed to manufacture and store AN, it is a product that is easily contaminated and/or converted to an unstable state that lends itself to a possible catastrophic situation. Indeed, if I was preparing to blast 13,500 tonnes of properly prepared ANFO (AN mixed with fuel oil) in an industrial area, I would have an evacuation area greater than 10km's	The methodology adopted for calculating risk was the methodology required and accepted by the NSW Department of Planning and Infrastructure.
Tony Richards	22.12		Ammonium Nitrate, when properly turned into an explosive, has a TNT equivalency of around 82%. The US military use 70% TNT equivalency for solid state ammonium nitrate. The applicant has attempted to provide figures relating to "Risk Analysis". As stated in their Volume וו, Annex A – D 2, Section15. ACHIEVING ALARP —The use of terms such as "as low as reasonably practicable" (ALARP) or "so far as is reasonably practicable" is a key concept in relation to the management of health and safety risks. If Proponent was genuine in wanting to show a commitment to proper —management of health and safety risks to achieve safety standards that are —as low as reasonably practicable they would use figures of TNT equivalency of 70% - 82%, and not the 5% - 32% as calculated in their application.	TNT equivalencies of 5%-32% referenced in the Hazard Analysis are taken from documents published by SAFEX, UK Health & Safety Executive, WA Department of Mines and Petroleum and Qld Department of Natural Resources and Mines. These publications refer to ammonium nitrate used for commercial blasting, as will be stored by the proponent (not for military purposes). The methodology adopted for calculating risk (including calculation of consequences using TNT equivalency values) was the methodology required and accepted by the NSW Department of Planning and Infrastructure.
Tony Richards	22.13		Please note that the two most common threads involving ALL the accidents listed in Attachment 1 are: 1. They did not consist of a properly mixed explosive use of AN. They happened unexpectedly without consideration of the often claimed need to turn the AN in to an explosive. They involved AN – held in a sometimes more stable format than Proponent' stored	Section 3.2 (Hazards of ammonium nitrate, Accident history) provides a summary of notable incidents since 1950. These incidents have been considered as part of the Hazard Analysis.

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			product proposal – that had unpredictably became exposed to fire, contamination, impact or as mentioned, in Toulouse France in 2001, from unknown sources. 2. They all consisted of relatively small quantities of AN in comparison to what is expected to be stored at Proponent Freightlines. No Ammonium Nitrate accident, anywhere in the world, at any time, should ever be considered as "not relevant" by Proponent Freightlines, as part of an application for AN storage.	
Tony Richards	22.14		Further to the downplaying of previous accidents, Proponent have provided risk assessments of hazards using spurious figures that are far too conservative to give a full picture of potential danger. They use stack quantities of 500 tonnes separated by just a few metres of distance.Very few countries would allow AN stacks to be in excess of 300 tonnes. Although this quantity is not unlawful in Australia, it does go against many international standards.In the UK, Ammonium Nitrate stack capacity is 300 tonnes. In the US the stack capacity is approximately 270 tonnes and in Canada the stack capacity is approximately 200 tonnes. Any stack of 300 tonnes or more, of AN, is capable of creating its own momentum if exploded. A self- sustaining blast of a 13,500 tonne stockpile of AN would be disastrous for the Newcastle community. The point of those figures is that if Proponent want to express a commitment to ALARP they would use world's best practice and reduce the stockpiles to 200 tonne or less.	The methodology adopted for the Hazard Analysis considered potential incidents involving up to 2,500 tonne of ammonium nitrate, not one stack of 500 tonne. This was the methodology required and accepted by the NSW Department of Planning and Infrastructure. AS 4326 and ammonium nitrate storage licensing requirements of NSW WorkCover allow for the storage of up to 500 tonnes of ammonium nitrate in a stack, with stacks separated by 3 metres. In the Hazard Analysis, alternative views on stack separation have been presented in Section 4.2 (Safe storage of ammonium nitrate, Australian Standards and Codes of Practice) and Section 4.3 (Safe storage of ammonium nitrate) International Standards and Codes of Practice. The methodology adopted for the Hazard Analysis considered potential incidents involving up to 2,500 tonne of ammonium nitrate, not one stack of 500 tonne. This was the methodology required and accepted by the NSW Department of Planning and Infrastructure, and is in accordance with the methodology presented in SAFEX.
Tony Richards	22.15		Further to the quantity size of the stacks, there is a best practice commitment that should be allocated to the distances between the stacks. In Proponent' application at Volume וו, Annex A – D 2 at 4.3.4 they	Refer to response to Tony Richards Comment No. 14.

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			refer to distances between stacks: —The approach taken by Queensland, requiring 8 metres separation distances between stacks seems to be adopting the belief that larger separation distances than currently specified in Australian and overseas standards are required, but does not adopt the separation distances specified in the SAFEX document. Queensland information also suggests that the stack separation distance of 8 metres has been determined amongst Australian regulators, and would be adopted in the 2008 version of AS 4326, however this has not been the case. All other regulators, and AS 4326, currently require a stack separation of 3 metres.‖ Once again, any real commitment to ALARP would demand the calculations for risk analysis be at a design distance between stacks (even reduced to 200tonnes) of 8 metres – not 3 metres.	
Tony Richards	22.16	**Environmental - Wetlands**	Proponent' own application at 5. ENVIRONMENTAL ASSESSMENT states: "Concentrations of Nitrogen (Total Oxidised) was reported above the laboratory limit of reporting in all sampling locations on site with the exception of one isolated location (BH05), located within the timber storage yard adjacent to the outdoor storage compound of Shed C. The highest reported concentrations were noted to be within the current outdoor AN storage compound south of Shed B, being MW02 (510 mg/kg) and MW04 (108mg/kg). Analytical groundwater concentrations for Ammonia (as N) were consistently encountered at all locations across the site above the level of reporting. Elevated concentrations of ammonia were reported for MW02 (16,400µg/L) and MW04 (4,620µg/L) located within areas of current and historic AN storage areas. Following findings from the Phase 1 ERM report (2012), MW02 was installed to target reported historical spills associated with the former	As noted in the EIS

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			historical operations in Shed B."	
Tony Richards	22.17		They go on to point out some Potential Impacts"The results of the investigation indicated that:Elevated concentrations of ammonia and nitrogen in soil were encountered in areas of current and historic AN handling and storage. PAHs and metals were encountered in the fill material on site and are considered likely to be related to filling activities and not current or historic operations on the site; and elevated concentrations of ammonia and nitrogen were encountered in groundwater in areas of current and historic AN handling and storage.Elevated concentrations of ammonia (as N) in groundwater are considered to be significant and warrant notification of the site under Section 60 of the CLM Act 1997. At this stage it is not considered that these elevated concentrations pose a risk to human health as it is highly unlikely that the groundwater is impacting on a drinking water source, however given the close proximity to surface water it is recommended that site practices are reviewed to minimise spillage of AN on the site and a programme of yearly groundwater monitoring be implemented across the site to assess ammonia and nitrogen concentrations and the effect of improvements on the management of AN."	As noted in the EIS
Tony Richards	22.18		Although water quality is not my field of expertise, it appears that the area has already been polluted to a degree that requires constant monitoring. Storage and handling of Ammonium Nitrate, in greater quantities than previously, will not reduce or lessen any potential pollution of groundwater to the health and safety of nearby residents.	A bi-annual ground and surface water monitoring programme is proposed at the site to assess ammonia and nitrogen concentrations and the effects of improvement on the management of ammonium nitrate on the site. The surface water monitoring programme will assess as a minimum in-situ water quality measurements (temperature, salinity, dissolved oxygen, pH and oxidation-reduction potential) with laboratory analysis reporting on Ammonia, Total Oxidised Nitrogen (nitrite and nitrate), total phosphorus and chlorophyll-a levels. Groundwater monitoring parameters will include ammonia as N, Total Oxidised Nitrogen, pH, dissolved

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				Arsenic, dissolved Cadmium, dissolved Copper, dissolved Zinc and PAH.
Tony Richards	22.19	**Human Health Risk**	Although each of the points above that make up this submission goes some way to addressing point 4, there are further considerations that require clarification or reinforcement. Shed C that has so far escaped mention has its own issues of concern. Shed C is supposed to hold 3,500 tonnes indoors of Ammonium Nitrate. As stated in the proposal Overview at 1.1.1, "Shed C...roof is lined with Asbestos and polycarbonate sheeting". In case of any accident involving fire or explosion in Shed C, that asbestos can be expected to be spread over Sandgate and surrounding areas.	Crawfords have advised that the owner of the site has agreed to remove all asbestos from existing buildings.
Tony Richards	22.20		There are two other areas of concern not covered in the Proponent application. The first is Shed D, that although their application states will not be used for storage of AN, it has previously been used to store general cargo that are high contaminants. Previously stored timber logs and aluminium ingots could easily provide combustible contaminants for AN. Aluminium dust would provide an extremely dangerous contaminant. Indeed I, and others, have previously added aluminium dust to AN to increase its explosive power. Proponent' application should be rejected AND additionally there should be a directive from NSW WorkCover specifically preventing AN storage in shed D at any time; now or in the future. The second area not covered is the use of wooden pallets. There is no mention anywhere of disposal of those pallets. Wooden pallets used for cartage or storage of AN should not be recycled because of possible contamination and combustibility. They should be destroyed.	Shed D is not to be used for the storage of ammonium nitrate. The only use of a pallets will be for product manufactured by Orica at Kooragang Island. Orica do not have flexible bag-handling capabilities and all flexible bags must be transferred to trucks on pallets. Flexible bags arriving from Orica on timber pallets are removed from pallets prior to storage. For Orica shipments (ie transferred into shipping containers), flexible bags are transferred from storage to pallets, and then loaded into shipping containers which are stored in the Shed C fenced compound awaiting export. The net result is that no pallets will need to be disposed of. Any unused pallets would be returned to Orica.
Tony Richards	22.21		Although an explosion from uncontaminated AN can usually be considered unlikely, the hazards associated, and recognised in	Refer to Section 6 (Hazard identification) of the Hazard Analysis: - Hazards from external fires and building fires have been included in

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			Proponent' application for storage of AN, cannot be ignored. The first of these hazards is fire. Any site fire from any source will be quickly enhanced by contact with AN. If a fire containing AN reaches a temperature of 170c the AN will become molten and extremely sensitive to impact and explosion.	the Hazard Analysis.
Tony Richards	22.22		The second hazard is decomposition. Ammonium nitrate can undergo thermal decomposition if it receives enough energy. At moderate temperature, the exothermic (a chemical reaction formed with the development of heat) decomposition is balanced by endothermic (a chemical reaction formedwith the absorption of heat) dissociation. Provided the gases produced can escape freely and no heat is being added to the system (eg through a fire) a steady state is reached.However, the decomposition can also become self-sustaining in the presence of contaminants, in the presence of combustible materials which generate heat as they are oxidised; or if the initial temperature is high enough. This self-sustained gas build up can result in an unexpected explosion. The third hazard is from the explosion itself. When determining any industrial storage complex there must be a balance between risk and consequence. No matter how many ways figures can demonstrate ways to limit the possible risks from an explosion in the storage facility, the outcome suggests the consequences could be catastrophic to Sandgate residents, Newcastle, and any person in the vicinity of the storage area, visiting the golf range or cemetery.	Refer to Section 6 (Hazard identification) of the Hazard Analysis:- Ammonium nitrate decomposition and explosion has been included in the Hazard Analysis. In NSW, the approach adopted for land-use planning is to calculate risk levels (taking into account both consequences and likelihood), and compare these against the criteria presented in HIPAP No. 4.
John Sutton	23.01	**Risk of Explosion**	Large stockpiles of AN such as that proposed in this development application pose a risk of catastrophic explosion that presents an unacceptable danger to residential areas within the blast risk contour.	The design and location of the storage sheds is in accordance with the risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, NSW

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				Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses. The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a demonstration that risk has been reduced to 'As Low As Reasonably Practicable'. The methodology adopted for the Hazard Analysis considered potential incidents involving up to 2,500 tonne of ammonium nitrate. This was the methodology required and accepted by the NSW Department of Planning and Infrastructure, and is in accordance with the methodology presented in SAFEX.
John Sutton	23.02		The DA has been classified as 'State Significant Development (SSD)' under Part 4, Division 4.1 of the EP&A Act 1979, as a consequence of AN being a Class 5 dangerous good, bringing the development within the ambit of development for the purpose of the manufacture, storage or use of dangerous goods in such quantities that constitute the development as a major hazard facility(MHF) within the meaning of Chapter 6B of the Occupational Health and Safety Regulation 2001.	As stated in the EIS
John Sutton	23.03		The quantity of ammonium nitrate that would be stored under this DA approval would make it the largest stockpile of AN in the Newcastle local government area (in fact, it may well be the largest such stockpile in Australia or the world). I am aware of a significant number of incidents involving accidental explosions of much smaller quantities of AN around the world with disastrous affects (see, for example, the incidents listed in the following Alert from the USA Environmental Protection Agency, "Explosion Hazard	Recommendations for product storage and handling requirements as identified in the EIS and Hazard Analysis (Annex B) have taken into consideration the requirements of AS4326 as required by NSW WorkCover. Section 3.2 (Hazards of ammonium nitrate, Accident history) provides a summary of notable incidents since 1950. These incidents have been considered as part of the Hazard Analysis.

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			from Ammonium Nitrate", 1993,	
John Sutton	23.04		http://www.epa.gov/osweroe1/docs/chem/ammonitr.pdf). An even more comprehensive list can be found at: http://en.wikipedia.org/wiki/Ammonium_nitrate_disasters#Texas_City.2C_United_States.2C_1947, which lists 24 such accidents at various locations around the world). The HSE Hazard Analysis accompanying the EIS for this DA also references 18 such accidents (Hazard Analysis, pp.12-13).	Section 3.2 (Hazards of ammonium nitrate, Accident history) provides a summary of notable incidents since 1950. These incidents have been considered as part of the Hazard Analysis.
John Sutton	23.05		As the US EPA document states: "*Although ammonium nitrate generally is used safely and normally is stable and unlikely to explode accidentally, accidental explosions of ammonium nitrate have resulted in loss of lives and destruction of property. These accidents rarely occur, but when they do, they have high impacts.*"	Section 3.2 (Hazards of ammonium nitrate, Accident history) provides a summary of notable incidents since 1950. These incidents have been considered as part of the Hazard Analysis.
John Sutton	23.06		A source from within the mining industry acknowledges that "large stockpiles of the material can be a major fire risk due to their supporting oxidation, and may also detonate" (see http://www.capitalco.com.au/Portals/0/Docs/Mining_Resources/Ammonium%20Nitrat e.pdf).	Section 4.1.1: (Safe storage of ammonium nitrate, Types of ammonium nitrate, Dangerous goods classification) of the Hazard Analysis confirms the classification of the ammonium nitrate as dangerous goods Division 5.1 (oxidising agent).
John Sutton	23.07		Accidental detonation of stored materials at a site such as that proposed in the Sandgate DA could occur through various means, including: • Natural events, such as lightning or earthquake. • On-site fire in equipment, such as conveyor, auger, loaders, trucks or forklifts. • Unexpected initiation by a mentally unstable member of the public or worker, or by terrorist action. • Other events listed in p.67 of the HSE Hazard Analysis that forms	Section 3.1.1: (Hazards of ammonium nitrate, Key hazards of ammonium nitrate, Explosion) considers the conditions required for an explosive event involving ammonium nitrate. Refer to Section 6 (Hazard identification) and Section 16.2 (Management Systems and Plans, Emergency plan) of the Hazard Analysis: - Ammonium nitrate explosion in the auger has been included in the Hazard Analysis (Incident Reference 3). - Ammonium nitrate decomposition and explosion involving trucks has been included in the Hazard Analysis (Incident Reference 2 and 5).

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				- Lighting risk has been managed according to AS/NZS 1768. - Security breach (sabotage / vandalism) has been considered in the Hazard Analysis. Site security is in accordance with the requirements of NSW Police. - Earthquakes are covered in the Site Emergency Plan. Hazards from external fires and building fires have been included in the Hazard Analysis.
John Sutton	23.08		As far as I am aware, no accidental explosion of ammonium nitrate has yet involved quantities similar to that proposed in this DA, but, on the basis of the experience of previous incidents, a worst case explosion of 13,500tonnes of AN at the Sandgate site would clearly directly affect tens of thousands of residents in the Newcastle area, and cause hundreds if not thousands of deaths, with many more injured, and massive destruction of built structures and damage to other parts of the surrounding physical environment. I accept that the probability of such an accident is low, but (as the examples demonstrate) accidents do happen - in fact, as I write, an accidental gas leak at Orica's Kooragang plant is being reported by the local media (Orica being another large stockpiler of AN in the Newcastle area), and the small possibility of such an accident must be balanced against the catastrophic magnitude of a potential explosion should an accident occur.	Within the Hazard Analysis, consequences and impacts were determined for a range of accident scenarios. These results have been combined with the likelihood of occurrence for each event based on the approach required by DP&I. The resulting contours for individual fatality risk, injury risk (explosion overpressure and toxic exposure) and risk of property damage and accident propagation have been determined, consistent with the approach required by DPI. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses. The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a demonstration that risk has been reduced to 'As Low As Reasonably Practicable'.
John Sutton	23.09		However, the hazard analysis accompanying the EIS for this DA does not appear to conceive of a catastrophic explosion of this magnitude, and therefore fails to deal with balancing risk probability and consequence magnitude. For example, the Hazard Analysis states that "The likelihood of occurrence of all potential	Refer response above.

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			accidents identified in this hazard analysis is considered to be low. The more likely hazardous events (eg incidents involving ammonium nitrate on vehicles or in conveyors) have limited impact beyond the site boundaries" (HSE Hazard Analysis, p.60). That may be so for "the more likely" hazardous events, but the potential catastrophic impacts of a low probability explosion event could be felt well beyond the site boundaries.	
John Sutton	23.10		The HSE Hazard Analysis notes HIPAP 4, which states that "Where there is an existing high risk from a hazardous installation, additional hazardous developments should not be allowed if they add significantly to that existing risk." (p.60) However, it then simplistically cites the previous operation of this particular facility to substantiate a low level of additional risk, apparently oblivious to the fact that much of this was non-compliant, and that a limited number of years of the operation of a single facility would not, in any case, represent a reasonable statistical basis for assessing risk for a quantity of material that presents such a catastrophic risk.	There are no other high risk hazardous industries in the immediate vicinity of the Crawfords site and therefore does not represent an additional development. The hazard analysis has demonstrated that the quantitative risk criteria are met with the exception of sporting complexes and active open space areas in relation to the adjacent Golf Driving Range, which the proponent is currently addressing through actions to ensure access is restricted to the subject area of land that lies within the risk contour. Refer response to item 1.01 above.
John Sutton	23.11		Transport operations associated with the facility present a further risk (albeit with more limited amounts), potentially triggered by contamination of the AN by fuels and other combustibles in the event of an accident (two accidents involving trucks carrying ammonium nitrate were reported in a four month period in Western Australia alone just last year: see http://www.miningaustralia.com.au/news/two-injured-in-ammonium-nitrate-truck-crash)	Ammonium nitrate decomposition and explosion due to truck fires has been included in the Hazard Analysis (Incident Reference 2 and 5). Major transport incidents (an incident involving ammonium nitrate due to a site vehicle or equipment fire, an external road or rail transport incident in the vicinity of the site, or any incident involving the nearby rail infrastructure) is covered in the Site Emergency Plan. All trailers used for the transport of ammonium nitrate are licensed for the transport of dangerous goods by the NSW Office of Environment and Heritage.
John Sutton	23.12	**Cumulative Risk**	Large stockpiles of AN are already located in Newcastle (on Kooragang Island). These already present what - in my view - represent an unacceptable risk to workers and residents within the	Risk of accident propagation is assessed in Section 11.3 and presented in Figure 8 of the Hazard Analysis. Storage of AN at Kooragang Island has no interaction with or

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			potential blast range.	relevance to assessment of the Crawfords development.
John Sutton	23.13		The EIS accompanying the development application fails to consider the cumulative risk associated with the proposed development adding to the current risk level presented by the existing AN stockpiles (clearly, X number of individual facilities each carrying a risk of X carry a cumulative risk of (at least) XY, without even considering any "domino-effect" risks arising from interactivity between the developments themselves (eg one stockpile explosion triggering explosion of another).	Section 3.1.1 of the Hazard Analysis considers the conditions required for an explosive event involving ammonium nitrate. Explosion or potential for explosion is caused by contamination of AN, self-sustaining or run away reaction caused by heating of AN stack by fire in close proximity or explosion due to confinement of gases generated by heating of AN. The site layout provides for separation of AN storage from combustible materials. Storage and handling of AN is in keeping with the requirements of AS4326 and NSW WorkCover.
John Sutton	23.14	**Non-Compliance Risk**	My understanding of the background to this application (implied, but not explicitly stated, in the EIS accompanying the DA), is that the company involved was storing quantities of AN that exceeded the 2,000 tonne limit for which it was licensed (http://www.abc.net.au/news/2012-02-03/company- caught-stockpiling-ammonium-nitrate-without-licence/3809008). Presumably, they also lacked planning approval for a facility storing such a quantity of ammonium nitrate.	Crawfords first occupied the site in December 2008. In December 2008 Crawfords obtained a licence from WorkCover NSW for the storage of 10,000 t of AN (5,000t in shed D and 5,000 t in shipping containers in the outdoor storage compound to the south of Shed B). In August 2010, Crawfords obtained the lease for Shed C which was previously held by Toll Resources. At this time Crawfords submitted an application to extend the WorkCover licence, which was granted in September 2010. The extended licence covered the additional storage of AN up to 13,500 t (5,000 t in Shed D; 3,500 t in Shed C; 1,500 t in shipping containers in the Shed C outdoor storage compound and 3,500 t in shipping containers in the outdoor storage compound to the south of Shed B). Operations since Crawfords occupation at the site commenced have been in accordance with the NSW Workcover licence for the site. The storage and distribution facility requires development consent under the *Environmental Planning and Assessment Act 1979* for the storage and distribution of 13,500 tonnes (t) of bagged Ammonium Nitrate (AN) from the Sandgate facility, as well as an Environment Protection Licence under the *Protection of the Environment Operations Act 1997* for the scheduled activity 'general chemical storage' which

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				has the capacity to store more than 2,000 t of chemicals.
John Sutton	23.15		Given the large quantity of ammonium nitrate involved here, and the potential catastrophic impact of an explosion involving such a quantity, authorities must insist on the highest level of compliance with regulatory requirements from whatever organisation is given approval to undertake such activity. The background to this matter would appear to suggest that there may be cause for concern in this case.	The facility will be regulated as a Major Hazard Facility (MHF) by NSW WorkCover and the storage of ammonium nitrate will be licensed by NSW WorkCover in accordance with current regulatory requirements. It is the Proponent's understanding that the proposed storage arrangements meet current ammonium nitrate licensing requirements. As a MHF, the Proponent will be required to submit a Safety Report (also known as a Safety Case) which demonstrates that risk has been reduced so far as is reasonably practicable. The Proponent is working with, and will continue to work with, NSW WorkCover to ensure that ammonium nitrate licensing and MHF requirements are met. Furthermore, the development will require an Environment Protection Licence under the *Protection of the Environment Operations Act 1997*, which will be regulated by the Environment Protection Authority. The development will also be subject to all conditions of development consent, which may include independent environmental auditing and reporting requirements.
John Sutton	23.16		These facilities should be located remote from residential areas. Government policy should focus on relocating the current large AN stockpiles around Newcastle to areas at least 10km from significant residential settlements, not expanding them in built up areas.	The suitability of the Sandgate site, along with alternative sites in Mayfield and Belford were assessed (refer to *Section 1.7.1* of the EIS) based on suitability criteria, including land availability and zoning, road network and traffic safety, site access and traffic safety, effective transportation logistics (including access to rail infrastructure to

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				reduce road transport), sensitive landuses, conflicting landuses, site safety, product handling and security, access to infrastructure and services and access to skilled labour. The current location of the site is suitable based on a number of locational and safety criteria, including: • It is in close proximity to both the Port of Newcastle and the Port of Sydney – the two sources of imported ammonium nitrate. • It is on the rail line from Sydney and provided with a dedicated rail siding for off-loading of product. • It is in close proximity to the Hunter Valley mining area, where the bulk of the ammonium nitrate is used. Any alternative location would need to have similar characteristics, and therefore would likely have similar surrounding land uses, and achieve no significant reduction in risk. Alternative site options were discounted for a variety of reasons including proximity to sensitive receivers and potential explosion risks, transporting product through congested and sensitive areas, noise impacts and incompatible land uses with regard to the consideration of AS 4326 and the policies of WorkCover NSW.
John L Hayes	24.01	**Traffic Impact**	This facility is simply a depot and as such every tonne of material carted into the site has to be carted out of the site. Almost every loaded vehicle also has an unloaded vehicle. This greatly escalates the vehicle numbers and massively raises the risks for other road users and for those residence and businesses along route roadways.	Loaded and unloaded vehicle trips are considered in the Traffic Impact Assessment in Annex J of the EIS (see Table 2.1). Existing traffic volumes are described in Section 2.3 of Annex J.
John L Hayes	24.02		The information provided in the application does not seem to reasonably explain the dangers and risks. It offers little information as to how this hazardous risk will be minimised whilst being transported.	Risks associated with transportation have been considered in the Hazard Analysis in *Annex B*.
John L Hayes	24.03		It must be noted that the trucks in use include the maximum permitted vehicle size. B doubles and Road Trains are currently in	Transport will be in accordance with relevant regulatory requirements including but not limit to the *Dangerous Goods Act 1985*.

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			use on the Industrial Highway and other roads frequented by Proponent (and their associates). B triples would seem to be a likely progression in the near future.	
John L Hayes	24.04		If approved the conditions of consent need to include maximum vehicle specification ad fully documented safety procedures.	Transport will be in accordance with relevant regulatory requirements including but not limit to the *Dangerous Goods Act 1985*.
John L Hayes	24.05		The use of rail from the Port to close to the final destination is to only sound option for the products handling and distribution.	The transport of AN from Port Botany to the site is by rail which involves far greater distances than the transport of AN from the Port of Newcastle to the site. Rail transport from the Port of Newcastle is not a viable option given the short distances involved.
John L Hayes	24.06	**Storage and Handling**	Ammonium Nitrate is an oxidising agent that is very corrosive and harmful to health. Ammonium Nitrate when mixed with other common products including water or diesel becomes even more potent. The massive Texas City explosion was triggered because Ammonium Nitrate got wet with a very small volume of water	Section 4.1.1: (Safe storage of ammonium nitrate, Types of ammonium nitrate, Dangerous goods classification) of the Hazard Analysis (*Annex B* of the EIS) confirms the classification of the ammonium nitrate as dangerous goods Division 5.1 (oxidising agent). Section 3.1.1: (Hazards of ammonium nitrate, Key hazards of ammonium nitrate, Explosion) considers the conditions required for an explosive event involving ammonium nitrate. The potential for explosive events, although highly unlikely, has been considered in the Hazard Analysis.
John L Hayes	24.07		Ammonium Nitrate when mixed with diesel becomes a very significant explosive. It is the explosive characteristic that is the end product of the material handled this proposed depot.	Section 3.1.1: (Hazards of ammonium nitrate, Key hazards of ammonium nitrate, Explosion) considers the conditions required for an explosive event involving ammonium nitrate. The potential for explosive events, although highly unlikely, has been considered in the Hazard Analysis. Explosion or potential for explosion is caused by contamination of AN, self-sustaining or run away reaction caused by heating of AN stack by fire in close proximity or explosion due to confinement of gases generated by heating of AN. The site layout provides for separation of AN storage from combustible materials. Storage and handling of AN is in keeping with the requirements of AS4326 and NSW WorkCover.

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John L Hayes	24.08		The cartage of AN and fuel in close proximity to each other is of very serious concern.	Section 15 of *Annex B* (page 63) summarises the actions implemented/required to reduce risk 'So Far As is Reasonably Practicable'
John L Hayes	24.09		It would also seem that the applicant fails to address the requirements of AS43 adequately.	Recommendations for product storage and handling requirements as identified in the EIS and Hazard Analysis (*Annex B*) have taken into consideration the requirements of AS4326 as required by NSW WorkCover.
John L Hayes	24.10	**Environmental Risk**	Ammonium Nitrate can be present in many states. Liquid, gas and solid. The product can change state readily either by itself or by design. If Ammonium Nitrate is spilt from a truck or escapes from the storage depot the consequences could be very severe particularly if the material washes into a watercourse. Damage to a watercourse would be extremely difficult to rectify. This potential hazard is exacerbated by its proximity to the Hunter River, the Hexham Wetlands and other low lying areas. The consequences of a spillage or leakage are simple not worth the risk in using this inappropriate site. This project certainly should not be considered as a State Significant Project given the project is without doubt a potential State significant disaster.	When stored and handled in accordance with AS4326 AN remains stable (refer Section 10 of MSDS included in Attachment A of Annex B). Environmental risks and consequences for wetlands associated with AN in stormwater or floodwater has been considered in the EIS. Proposed improvements in stormwater management, house-keeping and building integrity will reduce the risk of contamination of nearby wetlands and downstream. Modelling by BMT WBM has confirmed that the proposed stormwater structures alone will meet NCC targets for reduction of Total Phosphorus and Total Nitrogen for stormwater.
John L Hayes	24.11	**Residential Proximity**	There could hardly be a worse site in the Lower Hunter for this proposed activity. In addition to the risks and issues raised in the three points above this site is little more than a very makeshift storage area that utilises containers as walls and temporary plastic sheeting as roofing. The site sheds are not purpose built.	The design and location of the storage sheds is in accordance with the risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses. The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A

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				number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a demonstration that risk has been reduced to 'As Low As Reasonably Practicable'.
John L Hayes	24.12		Given the nature of the product and the volume involved I would have thought it would have been prudent to locate a green field site in a suitable industrial precinct to build a world class purpose built facility that was based on rail wago input.	Consideration of alternative sites has been provided in the EIS and in response to other submissions from the Public.
John L Hayes	24.13		The proposed site seems to have little regard for residents, hospital patients, university students, the Great Northern Rail line or those using one of the Hunt valley's major roadways.	See response to item 13
John L Hayes	24.14		The inability to reliably secure the locality due to it open plan, closeness to road and rail and isolation makes to site a well known target for thieves, vandals a potential terrorists.	The site is secured against unauthorised access, and a Site Security Plan has been prepared and reviewed by Inspector Marilyn Hamilton, the NSW Police representative on the WorkCover Major Hazard Facilities team.
John L Hayes	24.15		In the event of an explosion the primary blast impact radius could be three to five kilometres and the secondary impact radius ten or more kilometres. Clearly the potential for a major "natural disaster equivalent event".	The Hazard Analysis has assessed the level of risk of a an explosion and serious injury due to relatively short exposure period to toxic concentrations at the nearest residence or sensitive land uses.
John L Hayes	24.16		If Proponent are permitted to establish their facility then a consent condition should require the uptake of an insurance cover sufficient to compensate the community from their hazardous activity.	As far as ERM is aware there is no established mechanism or precedent for this proposal. It has not been deemed necessary for the many thousands of established industrial operations in NSW which may present a negligible risk to the communities they are established within and it is not deemed appropriate in this instance. Adequate controls are proposed to effectively mitigate any hazard to the community.
John L Hayes	24.17	**Health and Safety Risk**	The site has major health and safety issues. The site is landlocked with only one entry and exit on to a very congested roadway. In the event of a mishap evacuations of the locality and the mobility response vehicles would be severely hampered.	The adequacy of access to the site has been considered in the Traffic Impact Assessment. The assessment identified that the existing site access and circulation provide a safe and appropriate access arrangement for the development and that no improvements are

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				required to accommodate existing or anticipated growth in traffic. The adequacy of access was also a consideration in the Bushfire Hazard Assessment in *Annex K* with respect to adequacy of the property access road to provide access and egress in the event of an emergency. The access road complies with performance criteria for property access roads.
John L Hayes	24.18		The health and safety of the residents and community in a large area is at considerable risk due not only the consequences of a mishap but also to thing like the mental stress of living in fear of an event.	The design and location of the storage sheds is in accordance with the risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses. The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing a demonstration that risk has been reduced to 'As Low As Reasonably Practicable'.
John L Hayes	24.19	**Conclusion**	We believe the potential for danger and risk to the community far outweighs any potential benefit to the community that this Ammonium Nitrate storage depot would have.	see response above to this submission
John L Hayes	24.20		We believe Proponent' will find the insurance to cover the risk to the community for damage to life, the environment and property in practical terms uninsurable.	see response above to this submission
John L Hayes	24.21		This is an application for a project that is simply not necessary. This is a rail transport activity that should move the product from the Port area to close to the end use.	It is a requirement that AN must be moved from the port where it arrives within a short period of time to a location where it can be stored safely until it is required at the site it is to be used. The

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				Sandgate site is ideally located adjacent to a railway line and removed from residential areas for this purpose.
John L Hayes	24.22		Finally we urge that the proposal be rejected and further that Proponent Freightliners be required to desist from storing ANY ammonium nitrate on the site other that is on loaded trucks whilst in their depot.	The environmental impacts of the development have been carefully considered during the preparation of the EIS. It has been assessed that the project can be implemented with minimal adverse socio-economic and environmental impacts as demonstrated throughout this EIS. While some potentially adverse environmental impacts may occur during operation, these are generally minor and specific mitigation measures have been formulated to minimise any adverse impacts and ensure the operations can proceed in an environmentally sustainable manner. The project is justified on the basis of the efficient utilisation of existing resources and overall economic benefits to local and regional economies. It satisfies the objectives of ecologically sustainable development.
Petition - Residents Ferry, Mangrove and Maitland	25.01	**Public Safety - Vandalism**	The area of storage has long proved impossible to secure because of its proximity to the rail line. Regardless of security patrols, all the businesses in the area, including Proponent, have been victims of theft or vandalism. We are concerned that not knowing the danger, the vandals or terrorists may cause a fire or explosion.	The site is secured against unauthorised access, and a Site Security Plan has been prepared and reviewed by Inspector Marilyn Hamilton, the NSW Police representative on the WorkCover Major Hazard Facilities team.
Roads and Astra Street	25.02	**Traffic Impact**	We feel that distribution of the product will result in more trucks crossing Maitland Road, thereby delaying traffic and potentially cause accidents with catastrophic results	Traffic flow to and from the Pacific Highway and Old Maitland Road will be managed by existing signalised intersection. Traffic Impact Assessment has identified that no works are required to the existing signalised intersection. RMS and NCC concur with this assessment. The Traffic Impact Assessment also considered the intersection of the site access road and Old Maitland Road. Based on the indicative speed limit of 50km/hour the required visibility for the intersection is 69m. The existing intersection visibility exceeds 100m in both direction. Section 3.2.1 of the Traffic Impact Assessment states that there is currently sufficient capacity to accommodate the light and

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				heavy vehicle trips generated by the proposal and other nearby industrial developments and that no queues form on the service road during peak activity.
	25.03	**Alternative Location**	as this product is for the mines, we feel that it should be stored in that area, away from schools, hospitals, businesses and domestic buildings.	The suitability of alternative sites for the storage and distribution of AN is limited due to locational and safety criteria which must be satisfied. The current location of the site is ideal for the operations undertaken: • It is in close proximity to both the Port of Newcastle and the Port of Sydney – the two sources of imported ammonium nitrate. • It is on the rail line from Sydney and provided with a dedicated rail siding for off-loading of product. • It is in close proximity to the Hunter Valley mining area, where the bulk of the ammonium nitrate is used. Any alternative location would need to have similar characteristics, and therefore would likely have similar surrounding land uses, and achieve no significant reduction in risk. *Section 1.7.1* of the EIS details alternative sites considered, including a site in Mayfield and a site in Belford. The Sandgate site, along with the alternative sites in Mayfield and Belford were assessed based on suitability criteria, including land availability and zoning, road network and traffic safety, site access and traffic safety, effective transportation logistics (including access to rail infrastructure to reduce road transport), sensitive landuses , conflicting landuses, site safety, product handling and security, access to infrastructure and services and access to skilled labour. Alternative site options were discounted for a variety of reasons including proximity to sensitive receivers and potential explosion risks, transporting product through congested and sensitive areas, noise impacts and incompatible land uses with regard to the consideration of AS 4326 and the policies of WorkCover NSW.

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Rick Baynard	26.01		Please refer to the issues identified above in Public Submission # 24 from John Hayes	Please refer to the responses provided above to Public Submission # 24 from John Hayes
Colin Keith	27.01	**Public Safety - Vandalism**	Proponent propose to store 13500 tonnes of this dangerous product in an area virtually impossible to secure as the whole proposed area backs on to the Northern Rail Line. Most of the premises in that area at one time or another have been broken into suffering loss of property or vandalism despite security patrols.	The site is secured against unauthorised access, and a Site Security Plan has been prepared and reviewed by Inspector Marilyn Hamilton, the NSW Police representative on the WorkCover Major Hazard Facilities team.
Colin Keith	27.02	**Proximity to Business and Residences**	The storage area is approximately 1 - 1.5km away from St Jospehs Hospital and Nursing Home as well as daily occupied commercial buildings including Newcastle Markets and many domestic houses. At a recent meeting a senior explosive expert (retired) predicted that an explosion of 13500 tonnes of this product would devastate an area of five to 10 kilometres.	The design and location of the storage sheds is in accordance with the risk assessment standards and dangerous goods codes for MFHs. These standards and codes determine the appropriate spacing between substance storage areas and operations with the aim of minimising risk. Risk Criteria for Land Use Safety Planning – Hazardous Industry Planning Advisory Paper No. 4, New South Wales Department of Planning, 2011 (HIPAP 4.30) proposes a set of qualitative principles for considering the acceptability of risks in relation to surrounding land uses. The Hazard Analysis conducted by Health & Safety Essentials demonstrates compliance with the qualitative principles for land use safety outlined in HIPAP 4.30. A number of controls will be implemented, including a safety management system, emergency plan and security plan; providing ademonstration that risk has been reduced to 'As Low As Reasonably Practicable'.

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Colin Keith	27.03	**Traffic Impact**	Proponent claim the increased use of the facility would end double handling there-by allowing them to reduce the number of semitrailers by 10 per day, but I contend that the distribution of the project would provoke a large increase in the number of vehicles crossing Maitland Road at Sandgate holding up the already chaotic flow of traffic both ways causing more accidents.	Traffic will be directed via existing traffic controls. Traffic impact assessment has considered traffic trips to and from the site and identified that the existing intersections and signalling do not require alterations to meet existing and projected traffic.
Colin Keith	27.04	**Alternative Location**	As the product is for use in the valley mines, surely the most economic and safest method of distribution would be to store the product in the mines area reducing the number of trucks between the mines and sandgate.	The suitability of alternative sites for the storage and distribution of AN is limited due to locational and safety criteria which must be satisfied. The current location of the site is ideal for the operations undertaken: • It is in close proximity to both the Port of Newcastle and the Port of Sydney – the two sources of imported ammonium nitrate. • It is on the rail line from Sydney and provided with a dedicated rail siding for off-loading of product. • It is in close proximity to the Hunter Valley mining area, where the bulk of the ammonium nitrate is used. Any alternative location would need to have similar characteristics, and therefore would likely have similar surrounding land uses, and achieve no significant reduction in risk. *Section 1.7.1* of the EIS details alternative sites considered, including a site in Mayfield and a site in Belford. The Sandgate site, along with the alternative sites in Mayfield and Belford were assessed based on suitability criteria, including land availability and zoning, road network and traffic safety, site access and traffic safety, effective transportation logistics (including access to rail infrastructure to reduce road transport), sensitive landuses , conflicting landuses, site safety, product handling and security, access to infrastructure and services and access to skilled labour. Alternative

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				site options were discounted for a variety of reasons including proximity to sensitive receivers and potential explosion risks, transporting product through congested and sensitive areas, noise impacts and incompatible land uses with regard to the consideration of AS 4326 and the policies of WorkCover NSW.
Colin Keith	27.05	**Notice period**	Concerned that the facility having been rejected by Stockton residents is being thrust upon Sandgate residents without a respectable time to examine the details and reply.	Exhibition period for the proposal has been in keeping with the requirement of the DP&I.

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