

Coordinator-General's Report

on the

Environmental Impact Statement

for the proposed

Moranbah Ammonium Nitrate Project

**UNDER PART (4) OF THE QUEENSLAND
STATE DEVELOPMENT AND PUBLIC WORKS ORGANISATION ACT
1971**

May 2007



Queensland Government
The **Coordinator-General**

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1.0 Introduction

This Report has been prepared pursuant to s.35 of the Queensland *State Development and Public Works Organisation Act 1971* (SDPWO Act) to evaluate the Environmental Impact Statement (EIS) process for the proposed Moranbah Ammonium Nitrate Project (the Project) located near the township of Moranbah, in northern Queensland.

An Initial Advice Statement (IAS) was lodged on 7 March 2006 and the Coordinator-General (CG) declared the Project to be a “significant project for which an EIS is required”, pursuant to s.26(1)(a) of the SDPWO Act, on 31 March 2006. The CG issued the final Terms of Reference (ToR) for an EIS under part 4 of the SDPWO Act on 26 July 2006. The EIS was undertaken to meet the requirements of the ToR.

Investigations conducted by the Proponent before and during this EIS process, found that there were no matters likely to be impacted by the Project that would be of ‘national environmental significance’ as defined by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Therefore, the Proponent decided not to make an EPBC Act referral to the Department of Environment and Water Resources of the Australian Government. Consequently, no ‘controlled action’ pursuant to s.75 of the EPBC Act has been determined for this Project and no environmental impact assessment under Australian Government legislation has been required.

The objective of this report is to summarise the key potential impacts associated with the Project on the physical, social and economic environments at the local, regional, state and national levels. It is not intended to record all the matters which were identified and subsequently settled. Instead, it concentrates on the substantive issues identified during the EIS process.

This report represents the end of the State impact assessment process. It presents:

- an evaluation of the Project, based on information contained in the EIS, Supplementary EIS (SEIS) Report, submissions made on the EIS and information and advice from Advisory Agencies and other parties; and
- states conditions under which the Project may proceed.

2.0 Project Description

2.1 The Proponent

The Proponent for the Moranbah Ammonium Nitrate Project is Dyno Nobel Asia Pacific Limited (DNAP), a wholly-owned subsidiary of Dyno Nobel Limited (DNL), a company listed on the Australian Stock Exchange. DNL's current market capitalisation is approximately A\$2 billion and for the December 2006 annual fiscal period, realised a net profit of approximately US\$83 million based upon revenues of US\$1.4 billion.

DNL's principal activity is the manufacture and distribution of commercial explosives, initiation systems and related products and services to the mining, quarrying, tunnelling and construction industries in North America and Australia.

DNL is the market leader in North America, the largest explosives market in the world, and is the second largest supplier in Australia, the third largest explosives market in the world.

The company employs more than 3,300 people and has 36 manufacturing facilities in Australia, Canada, the US and Mexico.

2.2 The Project

DNAP proposes to build and operate a 350,000 tonnes per annum (tpa) ammonium nitrate manufacturing facility (ANMF) capable of producing 260,000 tpa of Ammonium Nitrate (AN) prill and 90,000 tpa of AN emulsion (ANE), principal explosives precursors for open cut mining. It is proposed to locate the facility approximately 4.5 km west-north-west of the town of Moranbah on Goonyella Road in the Belyando Shire in North Queensland.

The Project proposal includes four main operating components, each producing a separate product in the manufacturing process:

1. an ammonia plant to convert coal seam methane gas (CSMG) into ammonia;
2. a nitric acid (NA) plant to convert ammonia and atmospheric air into NA;
3. an AN plant to convert ammonia gas and NA into AN solution and AN prill; and
4. an ANE plant to convert AN solution and process oils into ANE.

The ANMF would also include:

- a number of tanks to store / stockpile product on site;
- the development of an on-site, gas fired, electricity generation facility; and
- a wastewater treatment facility.

The ANMF's location was selected for its suitability for the development of heavy industry, allows for adequate distance separation from Moranbah town, and has good access to mines in the northern section of the Bowen Basin. DNAP has negotiated access to an economical, consistent and reliable water supply from the

Burdekin Pipeline, as well as CSMG, both primary raw materials in the manufacturing process. The Project site, now owned in freehold title by DNAP, is currently designated "rural grazing" in the Belyando Shire Planning Scheme. It is partially cleared open woodland. The woodland is a heavily grazed 'not of concern' regional ecosystem.

Most of the ANMF is expected to be constructed from materials sourced within Australia. Parts of the AN and NA plants are currently being sourced from the United States. The construction period is estimated to be 22 months with a peak employment of approximately 550 staff that will be accommodated in a proposed construction camp to be located immediately northwest of the ANMF site.

The Project would also require upgrades of existing road infrastructure and the development of new road intersections to provide both adequate access to the ANMF during construction and the safe transport of product during operation.

The total capital value of the Project is approximately \$520 million.

2.3 Project Rationale

Demand for AN for use in explosives, particularly from Queensland's Bowen Basin mining industry, is expanding at a rapid rate reflecting the development of new mines and the expansion of existing mines. DNAP anticipates this latent demand would eventually lead to a significant shortfall in supply of locally manufactured AN and is now seeking to increase its regional production capabilities to meet this deficit.

Currently, there are two operational ANMFs in Queensland:

- the Moura AN facility in the southern Bowen Basin, which is operated as a joint venture between DNAP and CSBP Limited (a subsidiary of Wesfarmers Limited); and
- an ANMF managed by Orica Limited (a chief competitor to DNAP) in Gladstone.

These plants are operating at close to full capacity.

A number of alternatives to the Project were investigated, including the option of expanding the existing jointly operated Moura facility. The viability of this option could not be justified due to the unavailability of an economical supply of water for the expanded facility.

If the Project were not to proceed and demand for AN continues to increase at the expected rate, the cost of mining in Queensland may increase due to supply shortages and increased importation of higher-priced AN.

The Project would improve Gross State Product through local AN production replacing imported product.

The Project would also result in value-adding downstream processing of the significant CSMG reserves in the Moranbah region, some of which might otherwise be vented into the atmosphere, thus reducing the greenhouse gas impact of these emissions.

3.0 Impact Assessment Process

3.1 Significant Project Declaration

An IAS was lodged with the CG on 7 March 2006 and the project was declared to be a “significant project for which an EIS is required”, pursuant to s.26(1)(a) of the *SDPWO Act*, on 31 March 2006.

3.2 Review and Refinement of the EIS Terms of Reference

The IAS and a draft ToR were advertised for public comment on 29 April 2006. Comments were accepted until 29 May 2006. A total of 17 submissions on the draft were received from:

- Enertrade Pty Ltd;
- Industry Capability Network;
- Local resident;
- Anglo Coal Australia Pty Ltd;
- Belyando Shire Council (BSC);
- BHP Billiton Mitsubishi Alliance (BMA);
- The Department of Aboriginal and Torres Strait Islander Policy (DATSIP);
- The Department of Communities;
- The Department of Emergency Services (DES);
- The Department of Employment and Training (DET);
- The Department of Energy (now part of the Department of Mines and Energy);
- The Department of Local Government, Planning, Sport and Recreation (DLGPSR);
- The Department of Main Roads (DMR);
- The Department of Natural Resources, Mines and Water;
- The Department of Primary Industries and Fisheries (DPIF);
- The Environmental Protection Agency (EPA); and
- Queensland Transport (QT).

The following Queensland Government agencies did not provide comments to the ToR:

- Queensland Health;
- Queensland Treasury;
- The Department of State Development, Trade and Innovation ; and
- The Department of Housing.

A final ToR was issued to the Proponent on 31 July 2006.

3.3 Public Review of the EIS

The EIS was advertised on Thursday, 12 October and Saturday, 14 October in The Courier Mail and The Daily Mercury (Mackay) and on Friday 13 October 2006 in the Central Queensland News (Emerald), inviting submissions from the public until Tuesday, 10 November 2006.

The two-volume print version of the EIS could be purchased for \$100 and the CD-ROM edition for \$10.00. The EIS was displayed at Belyando Shire Council (BSC) offices in Moranbah from Wednesday 11 October 2006 for a period of four weeks, and was available on the CG's website.

The following advisory agencies were formally approached to evaluate the EIS:

- DATSIP;
- The Department of Communities;
- DES, especially the Chemical Hazards and Emergency Management (CHEM) Services Unit;
- The Department of Education, Training and the Arts (DETA);
- DLGPSR;
- DMR;
- The Department of Natural Resources and Water (NRW);
- The Department of Mines and Energy (DME), especially the Explosives Inspectorate;
- The Department of Housing;
- The Department of Health;
- DPIF;
- The Department of the Premier and Cabinet (DPC);
- QT;
- The Department of State Development;
- EPA; and
- Queensland Treasury.

Briefing sessions for advisory agencies were held in Moranbah on Wednesday, 25 October 2006 and in Brisbane on Friday, 27 October 2006.

Following the public review of the EIS a total of 16 submissions were received from:

- DES, CHEM Services;
- DETA;
- DMR;
- QT;
- DME (including the Explosives Inspectorate);
- The Department of Health;
- The Department of Housing;
- BSC;
- NRW;
- DPIF;
- EPA;
- Anglo Coal Australia Pty Ltd;
- Enertrade Pty Ltd;

- Local resident;
- Third party consultant; and
- Orica Limited.

The following agencies advised that they were satisfied that all issues had been addressed:

- DLGPSR;
- DSD;
- DATSIP; and
- The Department of Communities.

The substantive issues raised in submissions were as follows:

- Sterilisation of coal resources;
- Adequacy of, and modelling assumptions used in the Hazard and Risk Assessment (HRA) modelling;
- HRA issues including offsite impacts, risks arising from storage of AN and ammonia gas;
- Impact on the community with regard to housing, water and services (including child care and emergency services);
- Air quality impacts of the project and the modelling assumptions used;
- Water usage;
- Impacts on Grosvenor Creek; and
- Road and access infrastructure.

All submissions and responses were forwarded to DNAP and GHD Pty Ltd (GHD), the Proponent's consultant, and following discussions with those parties, it was determined that preparation of a SEIS was necessary to address the issues raised.

3.4 Review of Supplementary EIS (SEIS)

The proponent prepared additional information or clarification for inclusion in a document entitled "Dyno Nobel Ammonium Nitrate Plant: Supplementary Report for the proposed Moranbah Ammonium Nitrate Project: Responses to issues Raised: December 2006" (SEIS), which was lodged with the CG in December 2006. The SEIS included a comprehensive, cross-referenced summary table of each matter raised in the submissions.

On 22 December 2006, the SEIS was forwarded to advisory agencies and parties who had made a submission on the EIS.

The following agencies made comment or provided advice, which have been subsequently noted by DNAP and / or included as conditions in this Report:

- NRW;
- DME (including the Explosives Inspectorate);
- DPIF;
- EPA;
- DES, CHEM Services;

- DMR;
- DETA;
- QT;
- The Department of Housing;
- Local resident;
- Anglo Coal Australia Pty Ltd;
- BSC;
- Enertrade Pty Ltd;
- The Department of Health;
- Third party consultant; and
- Orica Limited.

Advisory Agencies were also invited to provide specific advice to the CG for consideration and inclusion as conditions or recommendations in this Report. Advisory Agency responses on the SEIS to the EIS were forwarded to the Proponent for additional comment or clarification, where necessary. DNAP subsequently provided further information or made specific commitments to address the remaining concerns. In particular, DNAP commissioned additional studies on the HRA component to analyse and clarify assumptions used in the original report.

Substantive issues raised in submissions are discussed individually in the following section.

4.0 Evaluation of Environmental Effects

4.1 Introduction

The SDPWO Act defines 'environment' to include:

- a) ecosystems and their constituent parts, including people and communities;
- b) all natural and physical resources;
- c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community; and
- d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).

'Environmental effects' means "the effects of development on the environment, whether beneficial or detrimental". These effects can be direct or indirect, of short, medium or long-term duration and cause local or regional impacts.

The following sub-sections of this Report outline the major environmental effects identified during the EIS process, including those raised in the EIS, SEIS, in submissions to the EIS and SEIS and in consultation with Advisory Agencies and other key stakeholders. I have provided comments on these matters and, where necessary, set conditions to mitigate any adverse impacts.

The Project will require applications for development approval (DA) to the Belyando Shire Council (BSC) under the *Integrated Planning Act 1997* (IPA) for the following components:

- ANMF and associated materials handling and storage facilities at Moranbah; and
- Construction accommodation village adjacent to the ANMF.

Pursuant to s.35 of the SDPWO Act, I have evaluated the environmental effects of the Project. I have stated conditions, pursuant to s.39 of the SDPWO Act, that must attach to any relevant DA granted by the BSC under IPA, to mitigate potential adverse environmental effects. In formulating these conditions, I have considered the following:

- information provided in the EIS and SEIS;
- comments in formal submissions on the EIS;
- comments from Advisory Agencies on the SEIS; and
- specific advice sought from Agencies and other key stakeholders.

In stating the conditions that must attach to each of the above DAs, I have nominated an entity as the concurrence agency for the condition of the DA, pursuant to s.41 of SDPWO Act. The conditions are summarised in Appendix 1.

Where the conditions of this Report relate to more than one development component of the Project, conditions may be allocated between those components, and also be implemented through separate DA(s), in consultation with the

applicant(s), the nominated concurrence agency and the assessment manager (BSC) at the time the relevant application for DA is lodged and with any necessary amendments to the conditions for such separate allocation.

In the event that Part 4, Division 8 of *SDPWO Act* applies to any component of the Project, the conditions are “imposed conditions” under Part 4, Division 8 and take effect from the commencement of the use of the relevant component of the Project.

The EPA will be the Assessment Manager for DA for undertaking Environmentally Relevant Activities (ERAs) pursuant to the *Environmental Protection Act 1994* (EP Act).

4.2 Land

4.2.1 Vegetation Clearing

Vegetation on the ANMF property has either been partially cleared or heavily grazed. The vegetation consists of a ‘not of concern’ regional ecosystem.

DNAP has obtained a vegetation clearing permit under the *Vegetation Management Act 1999* (VMA) for the main disturbance footprint of the ANMF and the construction camp. This permit was obtained in association with a ‘partial operational works permit’ granted by the BSC under IPA. Issuing of the vegetation clearing permit followed close consultation about the content of the EIS (with respect to native vegetation impacts and proposed mitigation measures) between DNAP, its consultant (GHD), vegetation management staff in the Mackay office of NRW, and staff of the Department of Infrastructure.

I consider that no conditions additional to those already set by NRW under the VMA for the current vegetation clearing permit are required.

Changes to the Project conceived late in the EIS process are likely to result in a need for additional vegetation clearing on the ANMF property outside of the area covered by the existing clearing permit. The needs for this additional clearing are discussed below and relate to:

- location of some additional AN transport facilities onto the ANMF property (refer section 4.6.6);
- changes to the AN prill storage area (refer section 4.7.4); and
- the potential increase in the size of the electricity generation facility (refer section 4.2.3).

I consider that any new vegetation clearing permit applications made to NRW under the VMA prior to December 2009 in relation to those three elements should be considered to be part of this Project and therefore a ‘relevant purpose’ under section 22A(2)(a) of the VMA.

4.2.2 Coal Resources

Both the Department of Mines and Energy (DME) and Anglo Coal Australia Pty Ltd (Anglo) have expressed concern about the location of the ANMF and its potential to sterilise a prospective coking coal resource. Anglo has also expressed concern that restrictions on land use in a zone, required as a consequence of the Hazard and Risk Assessment (HRA - see section 4.7 below), around the perimeter of the ANMF site may also limit the ability to undertake proposed coal mining operations northeast of the ANMF.

Anglo holds Mineral Development Licence (MDL) 274 over the area to be occupied by the ANMF and a large area to the northeast of Goonyella Road, as well as MDL 166, about 2.5 km north of the ANMF. The MDLs provide Anglo with the opportunity to investigate the potential for mine development; however the coal resource is still owned by the State and Anglo would require further approvals, including a Mining Lease (ML), to develop a mine.

Based upon existing geological information, there are two coal seams in the Moranbah Coal Measures of relevance to a discussion of a potential impact upon coal resources in the Project area:

- the Goonyella Middle Seam (GMS) (a correlative of the Harrow Creek Seam); and
- the Goonyella Lower Seam (GLS) (a correlative of the Dysart Lower Seam).

Anglo and other mining companies are successfully mining the GMS (or other correlative seams) elsewhere in the northern Bowen Basin region. Anglo is currently conducting feasibility for proposed underground mining of the GMS northeast of Goonyella Road.

Anglo has completed pre-feasibility studies for an underground mine northeast of the Goonyella Road. Its preliminary mine plan is to stop mining the GMS at the limit of its currently predicted commercial viability, about 1.5 km northeast of the ANMF. Anglo does not intend to mine the GLS within its current planning horizon.

Consultation between DNAP and Anglo at the Project's pre-feasibility stage indicated that Anglo did not then envisage undertaking any mining operations on the ANMF site because:

- the more commercially attractive GMS generally crops-out or becomes too oxidised well to the northeast of Goonyella Road and does not underlay the Plant site, or is overlain with a Cainozoic cover of semi-consolidated sands, gravels and basalt that may be unsuitable material to act as a roof for an underground mining operation; and
- there was insufficient information to be certain about the coal thickness, quality, or stability of roof material with respect to potential mining of the GLS, which does underlie the ANMF site.

During the early stages of the EIS process, Department of Infrastructure (DoI) staff attended a further discussion between DNAP and Anglo at which the suitability of the proposed ANMF site from Anglo's perspective was confirmed. This discussion did not address any potential risks to Anglo's proposed operations from a credible worst-case AN explosion or ammonia gas release event.

However, in a submission on the EIS, Anglo stated that the previously undisclosed 1.5 km “explosive buffer zone” described in the EIS, would both significantly increase the sterilisation of the potential coal resource and impede the efficient and cost effective extraction of these coal reserves.

DME has estimated (with a low level of confidence) that the inferred coking coal resource in the GLS sterilised by DNAP's entire 270 hectare ANMF property is approximately 10 million tonnes of raw coal in-situ. DME also concluded that DNAP should have considered alternative site options in light of the potential for coal sterilisation.

While I agree that any sterilisation of a coal resource is undesirable, and a broader analysis of location options for the ANMF site should have been undertaken prior to the selection of the proposed site, I consider that the ANMF should not be denied planning approval on the basis of coal resource sterilisation because:

- the ANMF does not directly sterilise the GMS, and measures can be applied to ensure that any safety hazard potential will not significantly interfere with the conventional mining of that resource in the vicinity of the Project (see section 4.7.7, Condition 12, and Recommendations 2 and 3 below);
- the depth, quality and thickness of the GLS resource underlying the ANMF is likely to make extraction less commercially attractive than other coal mining operations in the northern Bowen Basin for the foreseeable future, even for Anglo, the stakeholder currently in the lead position to commercially exploit this coal seam given its current and proposed mining operations in the general Project area;
- the GLS could be mined after the predicted 30 year economic life of the ANMF if coking coal prices, or mining technologies improve to permit economic extraction;
- it is possible that some parts of the coal resource that underlie the 270 hectare property could be mined in the future if that mining did not interfere with any of the ANMF's critical infrastructure;
- existing infrastructure has already led to sterilisation of a significant coal resource in the Project area, including Goonyella Road, the Enertrade Gas Compression Station (EGCS), the North Queensland Gas Pipeline, the Burdekin to Moranbah Water Pipeline, the currently disused Orica AN storage area, and even the Moranbah town itself; and
- the location chosen by DNAP offers many advantages for AN production, including its:
 - proximity to existing road and rail transport infrastructure;
 - relatively straightforward access to its Northern Bowen Basin customer base;
 - reasonable access to Moranbah town services;
 - adequate separation distance from the general Moranbah town population; and
 - its direct access to required gas and water input resource infrastructure.

I note that this decision to approve the ANMF's proposed location is quite different from the 2005 decision by the Minister for Local Government, Planning, Sport and

Recreation to deny planning approval for a Material Change of Use (MCU) over 63.1 ha of the large Grosvenor Downs property to the south of Moranbah, because that MCU application:

- was likely to sterilise a significantly larger volume of coal than the proposed ANMF property; and
- included a considerable proportion of more commercially prospective coal seams than the GLS.

Despite this, I urge DNAP to work cooperatively with both DME and Anglo to explore opportunities for the mining of the GLS that underlies its property, as long as the safe operation of the plant is not compromised.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 1

DNAP must collaborate in good faith with initiatives led by DME or Anglo (or any future holder of MDL 274 or a coal ML over or adjacent to the ANMF property) to maximise opportunities to mine any coal under or around that property that would not significantly compromise the safety, operational or environmental management systems of the ANMF.

4.2.3 Electricity Generation

The EIS describes that the ANMF will include on-site, off-grid electricity generation from gas-fired units with a peak capacity of 18 megawatts (MW).

Appendix 2 of this Report includes the conditions under the EP Act set by the EPA in relation to the operation of the electricity generation facility, including control of air emissions. The final design, construction and operation of the electricity generation facility, as it relates to the remainder of the ANMF, will also be subject to the approval of both:

- the Safety Management System for the ANMF by CHEM Services in DES for a ‘Major Hazard Facility’ under the *Dangerous Goods Safety Management Act and Regulation 2001* (DGSM Act - refer to sections 4.7.1 and 4.7.7 below); and
- the Explosives Inspectorate of DME, with respect to licences issued under the *Explosives Act 1999* (refer to section 4.7.1 below).

The connection of gas supply into the ANMF and generation facility will also be subject to the approval of the Petroleum and Gas Inspectorate under Chapter 9 of the *Petroleum and Gas (Production and Safety) Act 2004*. It is likely that responsibility for obtaining this approval will lie with the gas supplier (most likely Arrow Energy Pty Ltd). Arrow holds the Petroleum Lease over the coal seam gas supply area and is likely to hold the pipeline licence.

Therefore, I consider that no conditions additional to those already set by EPA under the EP Act (Appendix 2) for the electricity generation component of the ANMF described in the EIS and SEIS are required.

At the time of finalisation of this Report, DNAP was in advanced discussion with potential owner/operators of the electricity generation facility. Those discussions have included future options to both:

- connect the ANMF electricity generation to the national grid to sell small amounts (3-6 MW) of excess power; and
- install significantly larger electricity generation capacity than needed by the ANMF (potentially 2-3 times more).

Given that the risk and impact profile of the ANMF would be unlikely to be significantly altered by grid connection of an up-scaled electricity generation facility of the scale contemplated, I consider that it would be acceptable for a such a larger grid-connected facility to be established, provided that:

- emission conditions are consistent with those specified in Appendix 2 of this Report;
- CHEM Services and the Explosives Inspectorate are consulted with respect to implications for both the ANMF Safety Management System and licences issued to the ANMF under the *Explosives Act 1999* respectively;
- if the proposed electricity generation facility is above 30MW capacity, it be subject to a separate application for development approval under IPA; and
- DME is consulted with respect to any necessary ‘Generation Authority’ under the *Electricity Act 1994* (especially if the proposed electricity generation facility is above 30MW capacity).

As discussed in section 4.2.1 above, an expanded on-site electricity generation capacity may require additional vegetation clearing. Provided that such proposed new clearing is for an area not greater than 10 hectares more than required for the original electricity generation facility described in the EIS, I consider that any new vegetation clearing permit applications made to NRW under the VMA prior to December 2009 in relation to that facility should be considered to be part of this Project and therefore a ‘relevant purpose’ under section 22A(2)(a) of the VMA.

4.3 Water Resources

4.3.1 Potential Impacts on Grosvenor Creek

There are limited natural surface water resources near to the proposed ANMF. Grosvenor Creek is approximately 2.5km to the south of the ANMF site and run-off waters from the ANMF site drain into that creek following high rainfall events. Grosvenor Creek drains into the Isaac River several kilometres further downstream. Both are ephemeral watercourses and the adjacent land has generally unprotected soils (heavily grazed) from which a significant amount of sediment is generated following infrequent heavy rainfall.

During the EIS assessment period, no water quality testing and aquatic sampling was undertaken as Grosvenor Creek was not flowing and the standing water contained a high level of suspended solids and relatively high turbidity.

Both the Department of Primary Industries and Fisheries (DPIF) and the Environmental Protection Agency (EPA) have raised the possibility that the Project

may have a detrimental impact on Grosvenor Creek during the construction and the operational phase. DPIF considers that there is potential for increased turbidity during the construction period as a result of overland flow caused by a significant rainfall event (>50mm in 24 hours). Due to the high level of toxicity of the waste water, EPA is also concerned that overtopping of the evaporation dam could have a serious impact on the aquatic flora and fauna of Grosvenor Creek following a large rainfall event.

Both of these agencies have recommended further investigation into Grosvenor Creek’s aquatic biology, particularly given that standing waterbodies can act as important refuge for rare or endangered species and can give an indication of the species that may be present when the water is flowing. Investigations by DNAP’s consultant of aquatic ecology in Grosvenor Creek commenced in mid-March 2007. However, this may need to be repeated if flows in the creek do not allow development of aquatic communities (e.g. hatching and growth of macroinvertebrates and migration of fish).

As the documentation of the aquatic ecology is not a matter attached to any specific project licence or permit, this matter can only be dealt with as a recommendation rather than a condition.

Recommendation 1

- (1) During the first significant flow event of Grosvenor Creek following commencement of construction, DNAP should undertake studies of the aquatic biology of that Creek. Sampling should not be carried out during the period of first flush.
- (2) The methodology to be applied to the aquatic ecology studies should be consistent with that proposed within the EIS and should be discussed with EPA prior to implementation.
- (3) A copy of a report on the aquatic ecology monitoring is to be provided to the Regional Directors of both the EPA and the DPIF.
- (4) I nominate the Regional Director of DPIF as the responsible agency for monitoring compliance with this recommendation and deciding whether any follow-up monitoring is required.

4.3.2 Water Supply

Supply of water to the Project during both the construction and operational stages of the ANMF is not expected to negatively impact upon Moranbah’s municipal infrastructure.

Table 1 profiles the potential water demand for both the construction and operational phases of the Project.

Table 1. Quantities of Water Required for the Project

Water Parameter	Project Phase	
	Construction	Operation
Maximum hourly demand (raw water)		0.7 ML/hour
Maximum daily demand (raw water)		8.25 ML/day
Mean daily demand (raw water)	100,000 L	5.4 ML/day
Maximum monthly demand (raw water)		28 ML/month
Total potable water demand (ML/day)	Varies Max 0.220 ML/day for peak workforce	15 ML/day (max)
Total annual consumption (raw water)	Estimated 66.5 ML for the construction period	2,456 ML/year (max)
Water Provision Moranbah Township		50 ML/year
Total quantity of water required	66.5 ML (excludes potable)	91,000 ML (over the ANMF’s operational life)

During the Project’s construction phase, DNAP would contract a third party supplier to provide raw water to undertake dust suppression and commissioning activities associated with bringing the ANMF online. This supply would be sourced and transported from storage dams of operational mines in the region and will not impact upon BSC’s current water resources.

The relatively small amount of potable water for the Project’s construction workforce (which includes the construction camp) would be sourced and transported from Moranbah’s current town water supply. I note that DNAP acknowledges this use of Moranbah’s potable water resources will require replacement with the equivalent volume of raw water into BSC’s water supply system. There may need to be some flexibility offered to DNAP and the BSC about the timing of delivery of raw water from DNAP to the BSC which replaces these small quantities of potable water provided to DNAP from the BSC during the construction period. DNAP will not have access to its full volume of raw water from the Burdekin Pipeline until commissioning of the ANMF commences. I am satisfied that there will be minimal impact to the Moranbah’s water supply during the Project’s construction phase.

During the Project’s operational life of approximately 30 years, the Proponent would source raw water from the Burdekin to Moranbah pipeline, which is currently under construction. This pipeline will be operated by SunWater with an initial capacity of approximately 17,000 mega litres (ML) pa. The pipeline’s cost of construction is being underwritten by seven coal mining ‘foundation customers’ and has a completion date of around July 2007.

DNAP is finalising a 20-year supply agreement with SunWater. The pipeline’s largest foundation customer, BHP Mitsubishi Alliance Pty Ltd (BMA) and SunWater have a separate back-to-back agreement to initially cover this supply from BMA’s phased pipeline allocation. The respective agreements with SunWater allow BMA to cease supply from its allocation with two years notice. Under this circumstance,

the 6,000 ML augmentation (installation of additional pump stations) of the pipeline would be triggered.

To compensate for the additional water demands of the operational workforce and their dependants, DNAP has committed a portion of its BMP allocation to supplement Moranbah Town’s water resources. The EIS had originally proposed a quantity of 44 ML pa, which was calculated on the basis of:

- the permanent ANMF workforce of 70 people being entirely resident in Moranbah and moving into the town from elsewhere;
- including dependants of DNAP workers, a direct permanent population increase in Moranbah of 150 people; and
- each person using an average of 800 litres per day (which is much larger than daily current consumption targets in other parts of Australia, even correcting for regional climatic differences).

Despite this, the BSC’s submission on the EIS requested that DNAP allocate additional water to Moranbah to allow for the indirect flow-on effects of an expected expansion in Moranbah’s population employed by a range of service providers. In response to this request, DNAP agreed to increase its town water allocation from 44 ML pa to 50 ML pa.

While these matters have been under discussion, there have been two separate water initiatives evolving in the Moranbah area, *viz*:

- The DoI has been seeking to finalise a cooperative town water supply agreement for Moranbah between the key industry companies with a significant presence in the region, the BSC and the Queensland Government.
- Other industry stakeholders, in collaboration with the BSC, are supporting a separate initiative to identify other potential water use efficiency and water sharing opportunities.

DNAP supports these separate initiatives and is currently in a dialogue with key stakeholders about its role in them. In particular:

- DNAP’s 50ML pa contribution is included in the current draft Moranbah Water Supply Agreement;
- DNAP has made an offer to the BSC to supply water to the town above the 50ML pa amount whenever it has water excess to the Project’s process requirements (i.e. when the plant is operating at less than 100% capacity); and
- there may be a narrow window of opportunity for DNAP to amend the scale of the ANMF reverse osmosis water treatment installation to process non-potable water from other users.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 2

From the commencement of the water supply agreement between SunWater and DNAP, and then for the life of the ANMF, DNAP must supply at least 50 ML pa of raw water to the BSC for use in Moranbah’s town water supply.

4.4 Air Quality

Although there is very little background information available for this region, the EIS provides some information on the existing local sources of air contaminants. Air particulates and nitrogen dioxide (NO₂) sources include local vehicular traffic and the sporadic operation of the Ergon peaking power station. Further local emissions of dust result from wind erosion and mechanical generation through agricultural activity. On a regional scale, coal mining activity is likely to be another source of fine dust particulates.

Given that the ANMF is located 4.3 km northwest of Moranbah, any potential impact on air quality in the town is anticipated to be significantly reduced by the predominantly southeast winds.

In the absence of local data, the EIS has utilised data from areas that are more urbanised and industrially intensive than the Moranbah region for modelling purposes.

Emissions from the Project would add to the local air-shed both at the construction and operational phases.

I am satisfied that the mitigation measures proposed in the EIS and SEIS to reduce air emissions of particulates originating from internal combustion engines and dust associated with mechanical earth moving during the ANMF's construction, will be adequate.

There will be four primary points of release of emissions to the atmosphere when the ANMF is operational:

- the AN plant prill tower vent;
- the nitric acid vent;
- the reformer furnace; and
- the electricity generators.

Anticipated emissions of concern from these release points are either particulate matter or oxides of nitrogen (NO_x). Particulate matter emissions are expected to occur solely from the AN Plant and would consist of crystalline AN. Emissions of NO_x are expected to occur only from the nitric acid vent and reformer furnace.

I am satisfied with the estimates provided in the EIS that NO₂ will constitute no more than 30% of the NO_x emissions. Stack measurements at a similar AN Plant have demonstrated the NO₂/NO_x ratio to be between 5% and 10% at the point of release. Information available from manufacturers of similar electricity generators to those proposed for the on-site power plant indicated that a 30% NO₂/NO_x ratio at point of release is conservative.

The proposed technologies for the AN plant incorporate a selective catalytic NO_x reduction system and 100% air recycling in the prilling tower. These measures would ensure ambient air quality is maintained and atmospheric emissions are minimised.

It is probable that emissions from the ANMF would contribute marginally to the cumulative NO_x load in the Moranbah air-shed. Nonetheless, I am satisfied that air emissions will fall well within acceptable planning standards based on:

- predicted individual stack emissions, modelled on similar sized plants elsewhere;
- adoption of the mitigation measures described in the EIS and SEIS; and
- compliance with air emission limits set by EPA as defined in Appendix 2.

While the air quality assessment did not address emissions of carbon monoxide (CO), I note that CO emissions are anticipated to be of sufficiently low magnitude, due to the operation of a shift converter in the AN Plant, a technology that converts CO into CO₂. In consideration of emission data available from other Dyno Nobel AN plants, I am satisfied that the additional operation of the shift converter will generate insignificant levels of CO that would pass into the atmosphere.

I am satisfied that the proposed bag filter fitted to the prill tower will satisfactorily abate emissions of AN particulates.

NO₂ emissions from the nitric acid oxidation process have been included in the Air Quality Assessment Report (Appendix 7.8 of the EIS). The NO_x generated by the ammonia oxidation process will be converted to nitric acid in the absorber tower. Residual NO_x will be converted to nitrogen and water in the selective catalytic reduction process before releasing the waste gas to the atmosphere.

It is not anticipated that the odour emissions from the AN Plant or effluent treatment facility will be at levels to cause impacts to nearby land users.

Therefore, I consider that no additional conditions to those set by the EPA for air emission and air quality monitoring standards for this Project (detailed in Appendix 2) are required.

4.5 Housing and Social Services

4.5.1 Background

The current resources boom has resulted in a sharp increase in both the number of new mines and an increase in scale of existing mines operating in the northern Bowen Basin in the vicinity of the town of Moranbah. The effects of this boom have put severe pressure on local accommodation where both the housing and rental markets have approached full capacity, with significant increases in median house prices and rental costs during the last few years. Moranbah is surrounded by coal deposits and the availability of land for residential development has been severely constrained by the potential for coal sterilisation.

On 22 November 2004, the Queensland Government approved the establishment of the Coal Industry Coordination Group (CICG) to coordinate agency and government-owned corporation planning for infrastructure required to support the expected increase in coal production and export from central Queensland. The CICG provides a link between the coal industry, State agencies and Government-

owned bodies involved in the provision of critical infrastructure, with five sub-groups dealing with various aspects of infrastructure, including housing.

The Department of Housing (DoH) chairs the Coal Industry Housing Group (CIHG), a sub-group of the CICG formed to coordinate and facilitate housing infrastructure planning in the Bowen Basin. Under the direction of the CIHG, DoH commissioned a report to identify key housing issues associated with the rapid growth in coal mining activities in the Bowen Basin and to identify potential responses to these issues. The resultant 'Regional Housing Issues Report for the Bowen Basin' was released in February 2007.

On 24 November 2005, the former Minister for Local Government Planning Sport and Recreation decided not to approve a development application for a MCU and reconfiguration to convert 63.1 hectares of rural land into a 350 lot residential subdivision at Clements Street Moranbah (known as the Grosvenor Downs property). The reason for this decision was primarily the pre-existence of a Mineral Development Licence over the area and the high likelihood of sterilisation of valuable coal resource (refer to section 4.2 for a more detailed discussion of coal sterilisation issues).

Following that decision, the Queensland Government, the BSC, and other key stakeholders have been working together to resolve residential development issues under the banner of the Moranbah Growth Management Group (MGMG). The MGMG was established to prepare a strategic master plan for the orderly delivery of housing development and community infrastructure for the next 30 years. The MGMG has identified land development options for the expansion of the town:

- in the short term – essentially limited in-fill within the town plus new land development on the eastern side;
- in the long term – mostly southwest of Grosvenor Creek in an area known as 'Potters Field'; and
- in the medium term – completion of development in the existing new residential area between the Goonyella Road and Potters Field northeast of Grosvenor Creek.

The existing housing market comprises 30-40% of private rental with a median price of \$600-\$900 per week for a 3-4 bedroom dwelling. The vacancy rate for rented accommodation in Moranbah is extremely low. There is a very large number of people living within 30 minutes drive of Moranbah housed in temporary construction camps or single persons' quarters associated with coal mining or the development or operation of supporting infrastructure.

The large number of mining and construction workers earning above average incomes, some of whom receive accommodation subsidies, places further stress on the price of accommodation and other supporting social and community services in Moranbah.

Many people interviewed by GHD during the EIS community consultation program indicated their concern that the Project would have a negative impact upon new buyers and renters entering the housing market and the demand for other services.

Clearly, existing accommodation in Moranbah is incapable of supporting either the construction or operational workforce of any major new project without very substantial direct support to the supply of new dwelling units from the Proponent.

4.5.2 Construction Accommodation

The number of people directly employed during the 22-month construction period of this Project is expected to average 400 people, with a peak workforce of 550 people. DNAP has committed to housing its entire construction workforce in a purpose built accommodation camp located immediately northwest of the ANMF property. The BSC has expressed its support for this strategy and has already granted some approvals under an IPA partial operational works permit for the construction camp. The BSC had earlier rejected an original proposal to accommodate construction workers in expanded facilities in an existing workers' camp closer to the centre of Moranbah.

I support the view held by the BSC that the DNAP construction camp should not become a permanent residential facility. Discussion in support of this view is provided below in section 4.7.6 (and elsewhere in section 4.7), and I have set a development Condition 12 to define parameters for any future use of the construction camp site.

Section 4.6.2 and Condition 5 below deal with matters associated with the entrance to the construction camp.

I support the location of the construction camp adjacent to the northwest corner of the ANMF as described in the SEIS. Other than Conditions 4.2 and 4.7, I:

- set no additional conditions in relation to the location or operation of the construction camp; and
- make no further recommendations to the BSC to guide or restrict more detailed conditions it may wish to attach to the Integrated Development Assessment System (IDAS) approvals for the detailed design or operation of the construction camp.

4.5.3 Accommodation of the Permanent Operational Workforce

The AMNF will provide direct permanent employment for approximately 70 people, with potentially a further 20 people indirectly employed by other businesses in the transportation of the AN product.

The actual impact of permanent Project employees on the housing and accommodation market in Moranbah will depend on a number of factors only partly within the control of DNAP, including:

- the number of existing local residents employed at the ANMF; and
- the number on people employed at the ANMF from outside the region who take up temporary or long-term residence in Moranbah.

To minimise the potential permanent accommodation (and other social) impacts, DNAP has committed to:

- maximising the number of existing residents that it employs;
- requiring almost all of its permanent Project employees and families to live locally; and
- providing new dwelling units for all permanent employees and their dependants who live in Moranbah.

It is understood that these dwellings will consist of a combination of sizes and configurations, from multi-unit dwellings through to larger houses to accommodate larger families. DNAP has indicated its intention to create 70 new dwelling units, that is, approximately one for each permanent ANMF employee.

One aim of this strategy is to increase housing supply in Moranbah, rather than for DNAP to compete in the market for existing limited housing stock which would reduce supply. Despite this aim, DNAP will have a practical need to secure a small number of houses for its first Project development employees during the first two quarters of 2007. These houses may need to be secured before new houses can be built. Therefore, initially, it may not be reasonable to expect DNAP to stay entirely out of the existing housing market.

Added to this consideration is the longer-term desirability of avoiding the creation of an 'enclave' of DNAP houses in a single part of Moranbah. DNAP may wish to trade housing assets with other housing stock owners or new providers in Moranbah so as to avoid a concentration of its employees in one part of the town and to encourage a more natural social mix within the town.

Therefore, I consider that there should be a reasonable degree of flexibility in the extent to which DNAP must fulfil its permanent housing obligations from newly built dwelling units. I consider that setting a minimum limit of 85% of the proposed 70 dwelling unit target to be provided as new buildings should provide DNAP with the flexibility it requires. That is, if the 70 dwelling unit target remains unchanged, up to 11 houses could be provided from the existing housing market.

Therefore, I recommend the following condition to be attached to the IPA DA for this Project:

Condition 3

- (1) Prior to the commencement of operation of the ANMF, DNAP must:
 - (a) provide permanent housing in Moranbah for its employees and their dependants; and
 - (b) at least 85% of this housing must be newly constructed dwelling units.
- (2) BSC will be responsible for monitoring compliance with this condition.

4.5.4 Other Social Services

The BSC's submission on the EIS brought attention to the likelihood that the Project would place additional strain on a range of existing community and social services in Moranbah. I acknowledge that these services are currently under significant sustained pressure. However, in light of:

- the contributions required of DNAP by this Report in the areas of housing, water, and road infrastructure; and
- DNAP's close cooperation with the BSC with regard to arrangements for both the construction camp and the location of transportation providers,

I consider that it would be unreasonable to require the proponent to make additional contributions to other social or community services, as part of the formal development approvals process for this Project.

I recommend that there be no further conditions with respect to social or community services. Nonetheless, I encourage DNAP to work cooperatively with the BSC, Queensland Government agencies and other non-government organisations represented in Moranbah or the region to improve the quality, level and access to community and social services in Moranbah.

4.6 Transport Infrastructure

4.6.1 Intersection of the Moranbah Access Road and Peak Downs Highway

The Department of Main Roads (DMR) has identified a requirement for the upgrade of the intersection of the Moranbah Access Road and Peak Downs Highway to address potential safety impacts of transporting increased volumes of AN product during the Project's operational life. The intersection is located approximately 15 km south of the ANMF and is the main route for customer delivery to the south and east of the ANMF.

Comparing DNAP's own projections of servicing existing and future customers from the proposed Moranbah ANMF with current delivery options from its joint venture Moura ANMF or from Orica's Gladstone ANMF; or from imported AN product through the Port of Gladstone; and applying a simplistic assumption that all AN will be delivered through that intersection in B-Double vehicles carrying 50 tonnes of AN, I consider the following information to be relevant:

- Approximately 1,500 loaded AN trucks per year (approximately 4 per day) are currently passing through this intersection from the south, some turning left onto the Moranbah Access Road and some continuing northeast along the Peak Downs Highway.
- When the Moranbah ANMF is operating, approximately 3,300 loaded AN trucks per year (approximately 10 per day) would pass through this intersection from the north on the Moranbah Access Road, turning both left or right onto the Peak Downs Highway.
- When total truck movements from the Moranbah ANMF to the Proponent's Queensland customers (not just movements through that intersection) are considered:
 - before the Moranbah Project: approximately 415,000 tonnes of AN product are moved over an average distance of 385 km, resulting in total AN product movements of about 160 million tonne-km, and
 - after the Moranbah Project, 485,000 tonnes of AN product are moved over an average distance of 164 km, resulting in total AN product movements of

about 79 million tonne-km (i.e. less than half of the road pavement impact despite the increased total quantity of AN transported).

These conclusions are derived from more detailed 'commercial-in-confidence' information supplied by DNAP to the DoI. Obviously, consideration of return journeys of mostly empty trucks will approximately double the number of total truck trips, but less than double the road pavement impact and accident frequency. This analysis does not include delivery of AN product from Gladstone that DNAP forecasts will continue to be delivered from that location.

I acknowledge that DMR does not conventionally consider positive impacts on the broader State-controlled road network arising from projects of this nature.

From this information I conclude that, although the Project will significantly increase truck movements through the Moranbah Access Road / Peak Downs Highway intersection, the net impact of moving AN product supply closer to users will be a large reduction in truck usage of the State and regional road network which should significantly:

- reduce traffic and road maintenance requirements;
- extend road pavement life;
- improve the road hazard and safety environment (from both deliberate or accidental events); and
- reduce greenhouse gas emissions.

I consider these factors should be taken into account in deciding the extent to which DNAP should contribute to the cost of any required intersection upgrade.

I note DMR's concern that the increased number of vehicular interactions involving the type used to transport AN, (semi-trailers, B-doubles and road trains) represents an elevated road safety risk at this intersection. While DNAP has assessed that the actual traffic numbers generated by the Project would have a relatively minor impact on existing volumes, DMR is focused on the Project's impact on increasing the risk profile of the intersection.

Based on its traffic impact assessment in the EIS, DNAP recommended a Type Auxiliary Right (AUR)/ Auxiliary Left (AUL) treatment for the intersection, similar to the existing configuration, but with an expanded width on the north approach for separated right and left turn movements. While DMR agrees that the recommended Type AUR/AUL is consistent with the Proponent's traffic analysis, DMR's broader experience indicates that this intersection treatment no longer provides an adequate level of safety and has recently removed the Type AUR treatment from its Road Planning and Design Manual (RPDM). In its place, DMR has recommended the significantly more expensive Type CHR (raised channelised right turn) treatment and a Type CHL (raised channelised left turn) treatment. Chapter 13 of the RPDM specifies the following design requirements for these treatments as:

- a minimum 5.0m wide raised median to separate right turning traffic from the opposing eastbound traffic stream;
- a minimum 3.5m wide auxiliary right turn lane in the through road;

- a 3.5m wide through lane and a 1.5m wide shoulder for the westbound traffic on the Peak Downs Highway;
- a raised concrete median in the side road in accordance with Figure 13.84 of the RPDM that will extend north around the horizontal curve to the northern tangent point of the curve to provide adequate approach visibility to the nose; and
- full intersection lighting in accordance with chapter 17 of the RPDM.

DNAP has submitted information to support its contention that a relatively minor impact is expected at the intersection from Project operational traffic and that responsibility for the full cost of any intersection upgrade should be shared with other stakeholders. DNAP has stated in its traffic analysis, combined with background traffic growth rates used by DMR over the forecast period to 2018, the apparent impact from the increased traffic volume created when the ANMF is operational is limited to 3.8% during the AM Peak period and 5.5% in the PM Peak period.

While DNAP's specific peak transport forecasts can be debated, I do accept the Proponent's assertion that the intersection will require upgrading within the analysis period irrespective of the operation of the ANMF and this is another relevant factor in consideration of funding any required intersection upgrade.

With respect to the standard of any upgrade required for the Moranbah Access Road and Peak Downs Highway, I accept that the AUR/AUL treatment would be insufficient in terms of safety and that a version of CHR/CHL treatment proposed by DMR is the only reasonable alternative.

In light of the information above, I consider that it is unreasonable to expect DNAP to meet the intersection upgrade's full cost. However, I also consider that DNAP should make a significant capital cost contribution to the upgrade because its related business will be an important user of that intersection, which triggers the need for the upgrade.

Arrangements for cost sharing of the upgrade between DNAP, the Queensland Government and other potential funding sources, cannot be finalised within this Report's timeframe. Nonetheless, a commitment is required to fund and build the intersection upgrade within a reasonable time period. While it is strongly preferred that the intersection upgrade be completed prior to the commencement of operation of the ANMF, I acknowledge that some time will be required to finalise the design and agree upon cost sharing arrangements. Consequently, there is some potential that the intersection upgrade may not be complete before the ANMF commences operation.

During the second and third quarters of calendar 2007, the DoI will coordinate cost-sharing discussions:

- between DNAP and DMR;
- within Queensland Government; and
- with other key stakeholders such as the BSC,

to resolve funding arrangements for the intersection and ensure a timely delivery program for the upgrade.

As no detailed design or precise cost estimate (within 20%) for the intersection upgrade are yet available, it would be inappropriate to express DNAP's contribution in terms of an exact proportion of a total (unknown) final cost. As a general guide however, a contribution in the vicinity of 20-40% of the total upgrade cost would appear appropriate and has been discussed with key stakeholders. As very preliminary capital cost estimates of the upgrade could be slightly in excess of \$1 million, a minimum DNAP contribution of \$200,000 and a maximum contribution of \$400,000 might be anticipated.

I am advised that DMR has confirmed that it will share the cost of this intersection upgrade with DNAP.

An Infrastructure Agreement, as defined by section 3.5.34 of IPA, provides an appropriate mechanism to implement a cost sharing arrangement of the type I propose.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 4

- (1) Before January 1 2008, DNAP will either:
 - (a) enter into an Infrastructure Agreement with DMR that defines cost sharing arrangements for the upgrade of the Moranbah Access Road - Peak Downs Highway intersection; or
 - (b) pay DMR an agreed amount as its contribution to the cost of that upgrade.
- (2) The final design of the intersection treatment will be decided by DMR, in consultation with BSC and DNAP, but will be generally in accordance with the CHR/CHL treatment described in the RPD.
- (3) In the absence of agreement between DMR and DNAP regarding DNAP's financial contribution to this intersection upgrade, the amount will be determined by the CG, following discussions chaired by the DoI between DNAP, DMR, BSC and any other relevant stakeholders determined by the CG.

4.6.2 Entrance to the Construction Camp and ANMF from Goonyella Road

Changes from the original design outlined in the EIS to the intersections at the new access roads to the construction camp and ANMF from Goonyella Road have been recommended by DMR.

DMR has accepted the EIS construction camp traffic impact analysis on the Goonyella Road but not the Type BA treatment recommended for the intersection's access. DMR was concerned that this treatment would be inconsistent with the high speed environment and other intersections along this 100 km/h section of the road and the proximity to an adjacent horizontal curve. Consequently, DMR recommended a higher standard of treatment (a Type BAR right turn treatment and a Type AUL(S) short left turn treatment). DNAP has committed to meeting these new specifications.

DMR has also recommended that the construction camp access road be decommissioned following commencement of operation of the ANMF. Due to Hazard and Risk Assessment (HRA) considerations associated with future land uses immediately around the ANMF, I have decided that the construction camp should not be allowed to continue as a permanent accommodation site (refer section 4.7.6 and Condition 12). However, I consider that it is reasonable for a portion of the camp to continue to be used to house personnel directly involved in scheduled annual maintenance of the ANMF. Therefore, it will not be necessary to remove the construction camp intersection works until either DNAP ceases to use the construction camp to accommodate personnel directly involved in scheduled annual maintenance, or the ANMF is decommissioned.

The EIS describes that construction camp residents will use a direct access path 'across the fence' to the ANMF site rather than use Goonyella Road during the construction period. It is reasonable to expect that, during scheduled maintenance shutdown periods, maintenance workers resident at the construction camp will continue to use this direct access path. However, this access path should never become an alternative transport route for personnel, services or goods (other than as an emergency evacuation option) for the normal business of the ANMF.

The EIS traffic analysis for the access intersection for the ANMF recommended a Type AUR treatment. DMR expressed concern that the traffic analysis did not appear to take into account the type of materials hauled over the 30-year operational life span of the plant and that an upgrade is required. At full scale operation, there will be an average of 18 heavy vehicle exits from the site per day (assuming 13 B-Triples (65t load) and 4 B-Doubles (50t load) to deliver AN product, and 1 B-Double to remove waste). DMR recommended a Type CHR painted (channelised right turn) treatment and a Type AUL left turn treatment for the main ANMF intersection. DNAP has committed to meeting these new specifications.

The BSC has requested that any lighting required to be installed at intersections for this Project not be solar lights which have proven to be inadequate elsewhere in the Shire, especially during difficult visibility period around dawn and dusk.

As the Goonyella Road is currently a private road, DMR cannot be the Concurrence Agency under IPA for this condition.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 5

- (1) Within 90 days of commencement of construction of the ANMF under an IPA DA, DNAP shall complete construction of an access intersection from Goonyella Road to the construction camp with a Type BAR right turn treatment and a Type AUL(S) short left turn treatment in accordance with Chapter 13 of the RPDM and provide temporary intersection lighting in accordance with Chapter 17 of the RPDM.
- (2) The construction camp intersection need not be removed until either DNAP ceases to use the construction camp to accommodate personnel directly involved in scheduled annual maintenance, or the ANMF is decommissioned.
- (3) The construction camp intersection may never be permitted to become an alternative transport route for personnel, services or goods (other than as an emergency evacuation option) for the normal business of the ANMF.
- (4) Prior to the commencement of operation of the ANMF, DNAP shall complete construction of the main ANMF intersection with the Goonyella Road with a Type CHR (painted channelised right turn) treatment and a Type AUL left turn treatment in accordance with Chapter 13 of the RPDM with the following minimum design elements:
 - (a) 1.0m wide painted median to separate right turning traffic from the opposing northbound traffic stream;
 - (b) 3.5m wide auxiliary right turn lane in the through road;
 - (c) 3.5m wide through lane and a 1.5m wide shoulder for the southbound traffic on Goonyella Road;
 - (d) 1.2m wide by 30m long raised concrete median in the side access road generally in accordance with Figure 13.84 of the RPDM; and
 - (e) full intersection lighting in accordance with Chapter 17 of the RPDM.

4.4.3 Intersection of Goonyella Road and Mills Avenue

Both the BSC and DMR have raised concern about the potential impact of Project operational traffic on the intersection of Goonyella Road and Mills Avenue, approximately 7 km southeast of the proposed ANMF. That intersection is a primary access point to the Moranbah town centre. AN haulage trucks would move along Goonyella Road past the Mills Avenue turnoff.

This section of Goonyella Road that passes through Moranbah is currently a local authority road under the control of the BSC. DMR and BSC are currently discussing the extent, timing and funding arrangements of a potential State controlled road network extension along the Moranbah Access Road north of the Peak Downs Highway to Moranbah.

DMR expects that the increased number of vehicle interactions at that intersection, especially involving heavy trucks, would increase the risk profile beyond the safety standards of the existing Type AUR treatment. While DNAP’s traffic analysis recommends that the existing intersection treatment be retained, I accept DMR’s

recommendation that a higher level of intersection design is required to ameliorate potential safety concerns.

As for the Peak Downs Highway intersection, the prime issue is the extent to which DNAP should contribute to the cost of any intersection upgrade, given that it will be only a minor user of that intersection. DNAP has agreed to work with Council, Queensland Government and other key road user groups to identify the design, timing and cost-sharing arrangements for any future upgrade of the Mills Avenue intersection. The DoI can facilitate and chair these discussions.

Given current uncertainty about the future control of the Mills Avenue intersection, it would be premature for this Report to specify either precise design standards or minimum capital cost contribution of DNAP to any future upgrade. However, it appears reasonable that multi-party discussions should be opened on the basis that:

- a Type CHR/CHL treatment with night lighting similar to that described in Chapter 13 of the RPDM be the model first considered;
- DNAP will make a significant contribution to the capital cost of any upgrade;
- the proportion of total intersection traffic that may be attributed to the Project is one relevant factor in the determination of the magnitude of DNAP's contribution; and
- the Queensland Government will make a significant contribution to the capital cost of any required upgrade.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 6

- (1) Within 90 days of commencement of construction of the ANMF under the IPA DA, DNAP is to initiate discussions with the BSC, DMR and any other road user group nominated by the CG, about the timing, design and capital cost sharing arrangements for an upgrade of the Moranbah Access Road intersection with Mills Avenue.
- (2) Following those discussions, BSC and DMR will jointly determine the final design and timing of construction of the intersection upgrade.
- (3) Prior to the ANMF becoming operational, DNAP will pay to BSC a capital cost contribution to the intersection upgrade.
- (4) In the absence of agreement between BSC and DNAP about the financial contribution to be made by DNAP to this intersection upgrade, the amount will be determined by the CG, following discussions chaired by the DoI between DNAP, DMR, BSC and any other relevant stakeholders determined by the CG.
- (5) The proportion of total intersection traffic that may be attributed to the Project is one relevant factor in the determination of the magnitude of the contribution that DNAP will make to the intersection upgrade.

4.6.4 Traffic Movements during Construction

The construction of the ANMF would involve the movement of 15 to 20 oversized loads, including prefabricated modules and other components from the Port of Mackay. DNAP has committed to consult with the relevant State agencies, following the appointment of the transport contractor, in relation to these oversized transport movements to arrange specific routes, times and escorts. This consultation should include Queensland Transport (QT), DMR, the Department of Emergency Services (DES), and all relevant local governments and Police Districts between the Port of Mackay and the ANMF site.

While it may be argued that such consultation is largely a requirement of the *Transport Operations (Road Use Management) Act 1995*, I consider that it is useful to reiterate that requirement in this Report.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 7

DNAP will consult with QT, DMR, DES and all relevant local governments and Police Districts between the Port of Mackay and the ANMF site prior to all oversize transport movements associated with the construction of the ANMF.

Pursuant to the *Transport Operations (Road Use Management) Act 1995 - Transport Operations (Road Use Management—Mass, Dimensions and Loading) Regulation 2005*, QT will be the Concurrence Agency for this Condition.

4.6.5 Road Pavement Impact Assessment (RIA)

While a Road Impact Assessment (RIA) was undertaken for the EIS with the best information available at the time, DNAP has committed to completing pavement assessments on all of the nominated haul routes prior to commissioning the ANMF. The proposed roads to be used for transporting AN will generally be limited to those that are designed to carry B-Triple and B-Double transport configurations.

A finalised RIA will allow any other required Project traffic management mitigation measures to be identified and, if necessary, any further payments to DMR described formally in an Infrastructure Agreement. The RIA, any Infrastructure Agreement and five-yearly reviews of the RIA (which would evaluate changes to haul routes) should be undertaken with the Central Highlands District Manager of DMR. Any significant modification to haulage routes by DNAP within each five-yearly review period should also be reported to that District Manager.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 8

- (1) Prior to the commencement of the ANMF, DNAP shall:
 - (a) complete the RIA for all nominated Project haul routes;
 - (b) if requested by DMR, enter into an Infrastructure Agreement to formalise mitigation measures and any annual payments; and
 - (c) pay DMR the first-year annual contribution identified in the Infrastructure Agreement.
- (2) At the 5 year anniversary of the commencement of operation of the ANMF, DNAP should submit a new RIA to DMR’s Central Highlands District Manager which covers the next five year period and which details any new mitigation measures and required changes to annual payments to cover pavement impacts.
- (3) During the operation of the Project, the proponent shall inform DMR’s Central Highlands District Manager of any proposed significant changes to the existing haulage routes, haulage volumes, vehicle impacts etc which may require significant variation of the RIA and any contribution to mitigating road impacts.

4.6.6 Location of Transport Depot(s)

I acknowledge BSC’s concern that suitable depot locations for the trucks involved in the AN transportation have not yet been identified and assessed.

Delivery of AN product from the Project site will be undertaken by transporters contracted by DNAP’s clients, principally the mine operators. There are likely to be several different transport contractors involved and the vehicles of those contractors may be serviced and garaged at different locations. These transport operations could be owned by DNAP’s customers. More commonly however, the AN will be transported by third-party contractors that may have existing depot facilities or may need to develop new or additional depot facilities in Belyando Shire or elsewhere.

I consider that the transport of AN product is an integral component of this Project and this is evident in the discussion and conditions above. I note that DNAP has committed to assist its clients’ appointed transport contractors to locate any required new depot site at a suitable location in consultation with the relevant local government, and implement vehicle movement management initiatives if required. However, unless DNAP takes control of the transport fleet and sells AN delivered to its customer (rather than ‘on-truck’ at the ANMF gate), it will always have only partial influence over its clients’ choice of transport contractors and their supporting infrastructure.

At the time of the preparation of this Report:

- DNAP and BSC were in advanced discussions with an existing, local AN transport contractor about the potential relocation of some or all of its facilities onto the ANMF property;

- the Project has not included formal risk assessment for a full on-site truck depot; and
- existing vegetation clearing permits do not allow an area for full truck depot facilities (which DNAP now estimates may occupy about 14 hectares);

While I acknowledge that there may be considerable community and other benefits of locating transport depot facilities on ANMF property, I also consider that a significant truck maintenance and servicing facility located on the property would:

- increase the number of people (transport maintenance personnel) exposed to a potential low-risk lethal accident at the ANMF; and
- marginally increase the risk profile of the ANMF due to:
 - the increased storage of diesel and other fuels on site (i.e. potential sensitising contaminants to AN); and
 - the increased number of personnel on the ANMF site not directly employed by DNAP.

I accept that, at the very least, the Project will need to include:

- a truck parking area;
- a truck safety inspection and washdown facility;
- sufficient workshop facilities to undertake simple repairs to ensure the roadworthiness and safety of vehicles leaving the site; and
- a driver transfer and administration facility.

It might be argued that these elements constitute most of a fully functioning truck depot.

The risks posed by locating a truck depot onto the ANMF property would be reduced if both refuelling and major truck maintenance and repair work is undertaken off-site.

Any new vegetation clearing required for a truck depot on the ANMF property should be considered to be part of this Project, especially with respect to any future permit application under the VMA for such clearing.

Any truck depot located off the ANMF property would be subject to separate IPA approvals.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 9

A transportation depot may be included on the ANMF property as part of the Project, provided that:

- (1) the business located at that depot is primarily the transportation of AN or ANE from the ANMF;
- (2) a formal risk assessment for a depot facility is conducted in consultation with BSC, CHEM Services, the Explosives Inspectorate and DMR; and
- (3) major truck repairs, scheduled truck servicing, and truck refuelling are all undertaken off the ANMF property.

4.6.7 Road Use Management Plan (RMP)

DMR has submitted that DNAP’s Transport /Traffic Management Plan does not adequately cover all of the key issues identified in the EIS. In particular, a Road-Use Management Plan (RMP) needs to be prepared to address mitigation measures to be adopted such as monitoring and notification procedures advising road users of traffic restrictions, roadside clean up measures for accidents involving AN, for both the construction and operational phases of the Project.

DMR’s Central Highlands District Manager will provide a proforma guide to DNAP to assist with the development of the RMP.

In the future, if DNAP identifies any Project operational works (e.g. ancillary works and encroachments) to be undertaken on State-Controlled Roads, then plans for these will need to be submitted to DMR’s Central Highlands District Manager in accordance with the *Transport Infrastructure (SCR) Regulation 2006*.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 10

On commencement of construction of the ANMF under an IPA DA, DNAP and DMR will finalise agreement within 90 days and implement a RMP via consultation with the Central Highlands District Manager of DMR.

4.7 Hazard and Risk Assessment (HRA) Issues

4.7.1 General Background

Technical grade AN prill is produced as small, solid, round non-volatile granules and is classified as a Class 5.1 dangerous good under the ‘Australian Dangerous Goods Code’. This product is stable and non-volatile. AN emulsion (ANE) is a precursor for in-situ explosives manufacturing and AN is used in the emulsion manufacturing process.

The manufacture, handling, storage and transport of AN is legislated in Queensland under the *Explosives Act 1999*. AN and ANE are classified as explosives under the *Explosives Regulation 2003*, which is administered by the Explosives Inspectorate of the DME. Licences for the manufacture, handling, storage and transport of AN are issued by the Explosives Inspectorate.

The Queensland *Dangerous Goods Safety Management Act and Regulation 2001* (DGSM Act) regulates facilities in Queensland storing and handling significant quantities of hazardous materials as Major Hazard Facilities (MHFs) in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC: 1014(2002)). DES’ Chemical Hazards and Emergency Management (CHEM) Services is the lead agency for the enforcement of the *DGSM Act* and is responsible for the regulation of MHFs in Queensland.

The DNAP facility will be classified as an MHF based on the storage and handling of large quantities of ammonia and AN, and the risk the facility poses to persons, property and the environment outside of the facility. Occupiers of MHFs have certain obligations under Part 4 of the *DGSM Act* that include the requirement for:

- a systematic risk assessment for the facility;
- emergency plans and procedures;
- education and training;
- community consultation;
- development and implementation of a Safety Management System (SMS); and
- the production of a Safety Report.

The connection of gas supply into the ANMF and generation facility will also be subject to the approval of the Petroleum and Gas Inspectorate under Chapter 9 of the *Petroleum and Gas (Production and Safety) Act 2004*. It is likely that responsibility for obtaining this approval will lie with the gas supplier (most likely Arrow Energy Pty Ltd). Arrow holds the Petroleum Lease over the coal seam gas supply area and is likely to hold the pipeline licence.

The EIS and SEIS Report have provided considerable analysis of hazard and risk elements of this Project, which have been the subject of submissions from several non-government stakeholders (principally, Orica, Anglo and Enertrade) and government agencies (the Explosives Inspectorate, and CHEM Services).

The HRA conducted for this Project is documented in section 7.7 and Appendix F of the EIS, which was revised and updated (taking into account design changes) for the SEIS. Those documents further describe the relevant legislation and codes of practice that apply to HRA for this Project.

4.7.2 Project Design Changes

The SEIS describes several broad design changes to the plant intended to reduce health and safety impacts of incidents at the plant compared to the preliminary designs described in the EIS. These changes have principally involved amendments to the size, location and orientation of several chemical storage and manufacturing units including:

- the ANP storage was changed from two 6,000 tonne bulk, bunker-style storages, to separate containerised storage areas (the size, number and configuration of each of these storage areas is discussed further in section 4.7.4 below);
- to prevent projectile impact and knock-on effects to and from the three 140 tonne ANE tanks, they will be individually mounded, and provided with 6 m dirt-filled concrete walls on three sides that reach a height of 1m above the tanks;
- the 5,000 tonnes ammonia gas storage tank has changed from the original 4°C high-pressure (8 bar) design, to a refrigerated (-33°C) low-pressure (1 bar) unit to minimise both the likelihood and potential impact of an ammonia gas leak; and
- moving the closest accommodation unit in the construction camp a further 50 metres from the boundary of the ANMF.

Subsequent to the finalisation of the SEIS, DNAP has also committed to other improvements related to hazard reduction, including:

- reorientation of the ANE plant and emulsion storage tanks to significantly reduce the likelihood that any explosion of the emulsion plant would 'report' to the AN storage area causing detonation of ANP; and
- commitment to implementing international best practice in the design measures (at least to the standards defined by the Chemical Industry Association 1998 publication "Guideline for the location and design of occupied buildings on chemical manufacturing sites") to protect the control room and laboratory, administration and workshop buildings from potential site hazards (eg ammonia gas exposure, fire, or overpressure effects from an explosion) to ensure that risk to on-site personnel and critical process control equipment is as low as reasonably practicable.

Both CHEM Services and the Explosives Inspectorate have confirmed that it is a normal part of their regulation and licensing processes respectively to consult closely with the proponent during each step of the detailed design, construction and commissioning stages for an MHF and explosives factory respectively.

4.7.3 Validity of the Hazard & Risk Assessment (HRA) Methodology

Some submissions on the EIS focussed on the methodology and assumptions applied to the HRA. Aspects of the methodology questioned included the:

- appropriate use of Emergency Response Planning Group (ERPG) values to demonstrate compliance with accepted toxic injury risk criteria;
- efficiency of conversion of AN during an explosion ('efficiency factor');
- equivalency of AN to TNT in an explosion ('equivalency factor'), especially in relation to the difference between fertiliser and technical grade AN;
- extent to which 1-2 m separation of AN containers would prevent an explosion in one container causing neighbouring containers to detonate (transference);
- model used to predict impact distances resulting from an AN explosion;

- required separation distances to be applied to protected or vulnerable facilities outside of the ANMF; and
- potential for missile impact from AN container explosion rupturing the ammonia tank.

In particular, some submissions questioned whether the worst-case assumptions had been applied to the HRA in all cases. In general, on the advice of both the Explosives Inspectorate and CHEM Services, it appears that the approach taken in the HRA for this Project is acceptable for credible worst case assessment. While individual assumptions applied to the HRA may be debated, it should not be regarded as either especially flawed on the one hand or conservative on the other.

Offsite safety risk considerations of this Project are principally associated with low probability high consequence events for release of toxic ammonia gas and nitrogen dioxide (NO₂), and explosion of AN prill or ANE during manufacture, handling, storage or transportation. I consider that the general proposals submitted for the production and handling of these materials for this Project will be in accordance with planning and regulatory requirements during both the construction and operation of the ANMF. However, for a project of this nature, I also consider that it is appropriate to consider 'credible worst case scenarios' for both an ammonia gas release and a detonation of AN and ANE at the plant.

4.7.4 Separation Distances for AN Storage

Information in the HRA provides guidance on both a range of separation distances for various gas leaks and AN explosion events and the type of restrictions that could apply within these separation distances. However, I am advised by the Explosives Inspectorate and CHEM Services that the current best accepted practice in Queensland for these matters are defined in the Draft Explosives Information Bulletin No 53 (EIB53 - DME, 2007) and the Hazardous Industry Planning Advisory Paper No 4 (HIPAP4 - NSW Dept of Urban Affairs and Planning). Both HIPAP4 and EIB53 are less stringent in safety distances for some categories than the Australian Standard (AS2187), and have been developed following very extensive industry and scientific review.

EIB53 provides formulae for prescribing safety distances from different size AN storage stockpiles for 'vulnerable' and 'Class A and B protected' works (as generally defined in AS2187) The Explosives Inspectorate considers Goonyella Road to be Class A protected works for which separation distances should ensure an overpressure of not greater than 14KPa from an explosion. Residential areas, including accommodation camps, are Class B protected works for which separation distances should ensure an overpressure of not greater than 7KPa from an explosion. HIPAP4 advises that 7 KPa is the overpressure force at which:

- no fatality is possible;
- probability of injury is less than 10%; and
- any building damage would be minor and repairable (broken glass and internal joinery).

At the time of this Report's preparation, DNAP's proposal was to store the AN in containers stacked two or three high in stockpiles of up to 3,000 tonnes each.

According to EIB53, that configuration of storage would require a separation distance from Goonyella Road of 1025 m. However, the closest edge of the north-eastern most AN storage area in DNAP’s plan was only 600 m from Goonyella Road. Clearly, to be compliant with EIB53, DNAP was required to amend it’s AN storage design by moving it a further distance from Goonyella Road or reduce the size of individual stockpiles (or some combination of these two options).

EIB53 also provides guidance on the minimum separation distances between AN stockpiles (stacks). For a 500 tonne rectangular stack, lengthways separation would need to be at least 24m and widthways separation would need to be at least 8m. That guideline assumes no separation distances between individual containers. The Explosives Inspectorate has indicated its preparedness to consider smaller inter-stockpile separation distances that takes into account the significantly lower probability of explosion transference between containers separated by 1-2m.

It is not within the scope of this Report to define a new AN storage design for this Project. Nonetheless, I point out that, taking into account the discussion above of EIB53:

- there appears to be ample room within the current AN storage area footprint to accommodate the smaller EIB53-compliant stockpiles;
- a maximum individual stockpile size of 600 tonnes would virtually eliminate potential overpressure impacts above 14KPa beyond the perimeter of the site and negate several of the additional protection measures proposed below.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 11

- (1) All aspects of the design and operation of the ANMF will be compliant with Draft EIB53, especially with respect to AN storage.
- (2) The Explosives Inspectorate of DME will be the Concurrence Agency for this condition.

4.7.5 Future Land Use around the ANMF

It is apparent from the HRA described in Appendix F of the SEIS that there is no credible probability (less than 1 in 10 million) that a major incident at the ANMF will cause an off-site fatality as a consequence of ammonia or other gas release.

It is also apparent from the HRA that the Project complies with established planning guidelines with respect to risk of serious injury to offsite personnel or to occupants of the town of Moranbah. Nonetheless, ammonia gas is a highly toxic chemical, and for the quantities manufactured, used and stored for this project, the consequences will always be major if a large release event occurred. Similarly, I am advised by the Explosives Inspectorate that, contrary to the claim in section 6.2 of that HRA, it would have been possible that fragments resulting from a 3,000 tonne AN explosion could reach as far as 3 km from the Plant. Although the maximum size of each AN stockpile is now likely to be less than 1000 tonnes (refer to section 4.7.4 above), I consider that it would be prudent to implement sensible

proactive planning measures to prevent future encroachment of inappropriate land uses around the ANMF.

The Belyando Shire Planning Scheme provides one mechanism to manage such potential encroachment.

A worst-case ammonia gas release could drift east-south-east towards the town of Moranbah if the wind direction was from the west-south-west (approximately 0.3% of historical records) in concentration sufficiently high to cause eye, nose and throat irritation almost as far as the Moranbah town centre. Therefore, it is clear that:

- permanent residential development, currently no closer than 4.3 km from the ANMF, should not be allowed to encroach northwest of the Clermont Railway (2.6km from the ANMF); and
- there should be some restrictions on the future establishment of new business activities in a zone immediately around DNAP’s property.

I consider that it is reasonable to assume that for people located outside of DNAP’s property:

- there may be no warning time to take protective actions from overpressure forces resulting from an AN explosion; and
- with the implementation of both a suitable neighbour warning system at the ANMF and safety management systems at neighbouring places of business, there will be adequate opportunity to evacuate or otherwise protect personnel from the impacts of a major ammonia gas release.

Table 27 of the HRA reports that 1,450 m is the distance from the ammonia tank beyond which a major ammonia gas leak (300 mm hole, probability of 6 in 100,000) would result in a fatality rate of less than 1%.

While it is beyond the authority of this Report to set specific enforceable conditions related to local government planning schemes, I nonetheless make the following recommendation:

Recommendation 2

- (1) No future amendments to the Belyando Shire Planning Scheme should allow residential development northwest of the Clermont railway line or within a 2.5km radius of the ammonia storage tank in any other direction from that tank; and
- (2) Any future development approvals granted by the BSC should specifically exclude permanent places of business unrelated to the operation of the ANMF being located within 1,750 m of the ammonia tank without the prior conduct of a comprehensive risk assessment, developed in close consultation with CHEM Services and the Explosives Inspectorate, which contains specific safety measures to protect against the potential impacts of both a large ammonia gas release event and an AN explosion event.

4.7.6 Future of the DNAP Construction Camp

The BSC has provided approval, under a 30-month operational works permit, for the location of the Project construction camp approximately 1,500 m northwest of the ANMF. Most elements of that camp were in place by March 2007. As discussed above, this location would be within the zone of potential minor injury impact arising from a major ammonia gas release event during the commissioning and operation of the ANMF. Given that the final size of the AN container storage stockpiles is now likely to be below 1000 tonnes, the camp is probably outside any potential injury zone for a major AN explosion event.

Clearly, there is little risk to the construction camp's residents prior to commissioning the ANMF. However, during the commissioning phase, inhabitants of the construction camp should be kept to the minimum number of people required to undertake the commissioning work. I consider that, following the completion of commissioning and the commencement of full scale ANMF operations, HRA considerations dictate that ongoing use of the construction camp for worker accommodation should cease (outside scheduled annual maintenance periods) and any surplus accommodation buildings removed or converted to non-accommodation uses.

I note a post-SEIS request from DNAP that use of the construction camp for longer term worker accommodation be allowed. In support of this request, DNAP has submitted a Specified Level of Toxicity (SLOT) analysis for a 'largest credible' ammonia gas consequence event at the site. This analysis is of the type currently applied by the United Kingdom Health and Safety Executive (UK HSE) for dangerous toxic load dose calculations for land use planning decisions. This methodology is under investigation for use in Australia, but has not been applied here in standard planning practice.

I am advised by CHEM Services that the results of this SLOT analysis confirm that the location of the construction camp is outside the zone of potential fatality, but within a zone of potential injury for a largest credible ammonia gas consequence event. Therefore, I concur with CHEM Services' advice that the construction camp is an inappropriate location for longer term residential land use.

I note also BSC's request that only workers involved with the design, construction, commissioning or maintenance of the ANMF be permitted to be resident there.

General experience on other industrial projects has indicated that the risks of accidents or process malfunctions are higher during the plant commissioning phase than when steady-state operation has been achieved.

DNAP has indicated that every three years, a major eight-week maintenance program will be undertaken that will employ 200 people. A smaller-scale maintenance exercise will be undertaken in each of the two years between this three-yearly major maintenance cycle. Most of the ANMF will not be operational during these shutdown periods. Therefore, I consider that it would be reasonable for DNAP to accommodate its maintenance workforce in the construction camp during these scheduled periods.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 12

Full development approval for the construction camp should be conditional upon:

- (1) Only workers involved with the design, construction, commissioning or maintenance of the ANMF being permitted to be resident there.
- (2) During the commissioning phase of the ANMF, only those workers directly involved in the commissioning work being permitted to be accommodated there.
- (3) Within 180 days of commencement of full scale ANMF operations:
 - (a) use of the camp for worker accommodation should cease, except during each scheduled annual maintenance period for a maximum of 200 personnel for eight weeks per year; and
 - (b) accommodation buildings excess of those required to accommodate 200 people should be removed.

4.7.7 Anglo and Enertrade Gas Compressor Station (EGCS)

Anglo Coal has MDL 274 over the area to be occupied by the ANMF and over a large area to the northeast of Goonyella Road. Issues related to communication between DNAP, DME and Anglo about the location of the Plant and the potential sterilisation of coal are discussed separately in section 4.2 of this Report.

Anglo has stated to Dol staff that it is currently completing a pre-feasibility study of the resource which is likely to lead to an application for a Mining Lease (ML) during 2007. Any reference to Anglo Coal in this Report does not pre-empt any future decision under the *Mineral Resources Act 1989* to grant an ML to Anglo, but acknowledges the reality that, as the current MDL holder, with existing commercial coal mining operations in the near vicinity, Anglo is the most likely entity to undertake mining of the coking coal resource in the zone of interest to this Project. The discussion with respect to HRA issues below would apply to any future mining of that seam, irrespective of the holder of any future ML.

While the precise southwest boundary of mining is not yet known, it appears likely that mine panels would terminate underground at a horizontal distance of 1.5-2.0 km northeast of the ANMF. Anglo's current draft mine plans (subject to potential change) estimate that air ventilation structures would be constructed along a line that runs approximately parallel to the northeast boundary of the ANMF, about 1.8 km from the ammonia storage tank.

Similarly, while Anglo has not yet formally defined the boundaries of its proposed ML, it appears likely that the southwest ML boundary will border the current Goonyella Road, immediately opposite the ANMF property. Consequently, it appears likely that Anglo's future mining operations will fall within the zone of potential (non-lethal) impact from a worst-case ammonia gas release incident or AN explosion.

With respect to HRA of underground coal mining within this zone, I have considered the various potentials under credible worst-case scenarios for:

- toxic gases to be taken into mine air ventilation system;
- overpressure from an AN explosion to interfere with the safety of conventional surface operations around an underground mine; and
- ground vibration from an AN explosion creating a seismic force that may be conveyed to underground mine structures.

A lethal delivery of ammonia gas to the ventilation system intakes would be very unlikely especially given the low-probability of prevailing winds and other weather conditions required to deliver a harmful concentration. Nonetheless, the case of mine air intake vents presents a special case requiring a higher level of protection, because, in the event that toxic gases are taken into the vents, they will not be significantly diluted prior to reaching underground mine workers (notwithstanding that emergency breathing apparatus is usually available close to each underground mine work site).

I consider that it would be inconsistent to extend protection measures for mine workers and not to extend similar protection for workers in other businesses located on the surface within about 2 km of the ANMF. The existing EGCS is at the margin of this 2 km zone. Transfield Services Ltd is considering locating a power station about 1.2km from the ANMF.

I note that the HRA incorrectly states that the EGCS is an unmanned facility. In fact, there are usually one or two personnel at the Station each day. I consider that this does not significantly alter the general conclusions to be drawn from the HRA with respect to the EGCS.

Despite planning protection measures contained in Recommendation 2, the onus should be on DNAP to carry the cost and responsibility of protection or mitigation of hazards arising from its operations. I consider that adequate measures should include an incident warning system with detectors at both the ANMF and potential sensitive impact locations, combined with automatic protection devices for the vent intakes. I understand that it is feasible for underground coal mine vent systems to be fitted with an automated shut-off mechanism that can prevent surface air inflow.

The ERPG2 limit for ammonia gas is 150ppm. Based on best practice at other facilities where large quantities of ammonia gas are stored, DNAP's proposed Safety Management System will specify that a rapid corrective response will be triggered when on-site gas detectors measure more than 100 ppm.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 13

- (1) Prior to the commencement of operation of the ANMF, DNAP is to install and maintain both manual and automated warning systems at the Moranbah EGCS, and all places of business located within 2km of the ammonia tank to warn of an ammonia gas release event (registering greater than 100ppm on any two internal ANMF monitoring devices).
- (2) DNAP is to ensure that any future underground coal mine air intake vents installed within 2km of the ammonia tank are equipped with air intake controls linked to ammonia gas detectors on the vent structure, to the ANMF control room, and to any automatic ammonia gas release event warning system. DNAP will cover the full cost of installation and maintenance of these control systems.
- (3) The manual and automated warning systems installed at locations outside of the DNAP facility will be treated as safety critical equipment and form part of the Safety Management System for the ANMF, which is subject to the approval of CHEM Services.

IPA conditions cannot be applied to areas subject to an ML. This Report cannot set conditions to be attached to any future ML over this area. Nonetheless, I consider that it is reasonable to make recommendations to the Minister responsible for the *Mineral Resources Act 1989* about conditions that may attach to any future ML granted over the coal resource covered by Anglo's existing MDL 274 to further protect the safety of future mine operations.

With respect to the potential for overpressure from an AN explosion to interfere with the safety of conventional surface operations around an underground mine, I consider that it would be reasonable to require that all permanently staffed buildings, or buildings that house critical control equipment, located within 1,750 m of the ANP storage area be capable of withstanding a 14 kPa overpressure event. I am advised by DME that current standard vent designs conventionally conform to this standard.

Potential redesign of the AN storage area, as described in section 4.7.4 above may eliminate the potential of a 14 KPa overpressure event northeast of Goonyella Road.

While not intending to interfere with normal coal mine operations within 1,750 m of the ANMF, I consider that it would be reasonable to exclude a narrow list of other potentially higher-risk mine operations that might occur within this zone. These activities are storage of explosives and establishment of workforce accommodation or mine site administration facilities. Consultation with Anglo has indicated that these conditions could easily be accommodated within its current plans for its proposed Grosvenor Mine.

Therefore, I make the following recommendations to the Minister responsible for the *Mineral Resources Act 1989*:

Recommendation 3

Any future ML granted over existing MDL 274 should state the following conditions:

- (1) All permanently staffed buildings or buildings that house critical control equipment located within 1,750 m of DNAP's AN prill storage area should be subject to a risk assessment, conducted in consultation with CHEM Services and the Explosives Inspectorate.
- (2) Storage of explosives and establishment of workforce accommodation or mine site administration facilities should not be built within 1,750 m of DNAP's AN prill storage area.

Finally, I consider the potential for ground vibration from an AN explosion creating a seismic force that may be conveyed to underground mine structures. The one dimensional analysis reported in the HRA indicates that the peak particle speed velocity of ground vibration caused by a 3,000 tonne ANP explosion would be 4 mm/s at the likely closest point of the GMS coal resource of a future Grosvenor Mine. This value appears to fall within the range of vibration values reported in the Australian Standard for Explosives Storage Transport and Use (AS2187.2, Appendix J – 1993) for vibration arising from a force of the size modelled in the HRA and measured at the distance of 1 km. The force-distance relationships for vibration beyond 1 km from the source are not reported in AS2187.2. The 4 mm/s result compares to:

- a structural failure criterion for surface buildings reported in the HRA of 50 mm/s;
- the AS2187.2 standard of 25 mm/s for reinforced concrete or steel structures;
- the AS2187.2 standard of 10 mm/s for houses and low rise buildings;
- different vibration standards of 3-70 mm/s for buildings in the USA (Department of the Interior 1987 Regulation 816.67), Germany (DIN 4150), France (87/70558), and Sweden (SS 460 48 66), depending on distance, blast frequency, geology and building sensitivity;
- US Army Corp trials that reported the structural integrity of unlined tunnels in sandstone and granite was not compromised until peak particle velocities exceeded 900 mm/s
- a commonly applied criterion of 5 mm/s for sensitive heritage listed buildings.

Any risk to mine structural integrity has been substantially reduced by the more recent requirement for DNAP to reduce the maximum size of its AN stockpiles to conform with EIB53 (refer to section 4.7.4 of this Report). It now appears likely that the largest credible worst-case AN explosion would be less than 1000 tonnes, that is, less than one third of the explosion modelled in the vibration analysis in the HRA.

On the basis of this simplistic analysis, I consider that the risk of damage to underground coal mine structures (eg tunnels and shafts) at the proposed Grosvenor Mine from a large AN explosion at the ANMF is extremely low.

Nonetheless, mine structural safety standards are set by seismic criteria, not vibration estimates.

Anglo holds a significant volume of geological and seismic information for this area and has agreed to make this information available so that more detailed analysis of the ground shock risk can be undertaken. DNAP and Anglo have agreed upon both a methodology and an independent party to undertake a desktop vibration assessment of the level of vibration expected at the proposed Grosvenor Mine. This analysis will consider the pulse energy and associated ground vibration generated from the ANMF through the rock strata to the proposed underground mine. It will give approximate levels of vibration and assist in determining the need or otherwise for a more detailed assessment.

It is anticipated that more detailed seismic modelling would be required only if this initial independent review demonstrated an unacceptable level of risk to the safety of the Grosvenor Mine. The Mines Inspectorate at DME is the logical group to examine the independent review and determine any need for more detailed modelling. The Mines Inspectorate would need to make such a determination in consultation with the Explosives Inspectorate, Anglo and DNAP.

Therefore, I set the following condition to be attached to the IPA DA for this Project:

Condition 14

- (1) Prior to commencement of construction of the ANMF under an IPA MCU, DNAP will request a determination from the Mines Inspectorate on any recommendations in the independent review of ground shock risk to underground mine structural integrity of the proposed Grosvenor Mine, northeast of the ANMF. Specifically, this determination would include a direction to DNAP on whether it should commission more detailed seismic modelling of ground shock from a potential explosion at the ANMF.
- (2) If more detailed modelling is commissioned, the Mines Inspectorate will evaluate the results of that work and determine whether any further special mitigating conditions need to be subsequently attached to the ‘Licence to Manufacture Explosives’ under section 38 of the *Explosives Act 1999*.

4.7.8 Protection of Existing Enertrade Gas Pipeline

Enertrade Pty Ltd’s (Enertrade) high pressure North Queensland Gas Pipeline (NQQP) runs parallel to the Goonyella Road, along the northeast boundary of DNAP’s property.

Ground vibration resulting from a large AN explosion could also be a potential risk to the integrity of that pipeline. The HRA estimated a potential peak particle velocity of 17 mm/s from a 3,000 tonne AN explosion event, compared to a failure criterion of 127 mm/s. A reduction in the maximum size of the an individual AN prill stockpile to below 1000 tonnes, as discussed in section 4.7.4 above, would reduce this risk even further. Therefore, I conclude that AN explosion does not represent a credible threat to the NQQP.

A significantly more likely risk to the NQGP could come from damage during construction of the ANMF. While the EIS documentation and draft EMP outline general protection measures that will be implemented to protect the pipeline, specific protection measures had not been finalised with Enertrade when the SEIS was finalised.

However, I have been informed that specific protection designs were shared between DNAP and Enertrade during early 2007. I have also been informed that subsequent field inspections by Enertrade personnel confirm its satisfaction with proposed protection measures and early works already undertaken under a separate partial operational works IPA approval. Therefore, I consider that there is no need to set conditions in relation to this matter.

5.0 Environmental Management Plan (EMP)

5.1 Introduction

If this Project proceeds, DNAP will become responsible for environmental management of the ANMF site (including the safety buffer zone). The EIS states that DNAP targets the achievement of high environmental standards and outcomes to ensure that activities within the ANMF are ecologically sustainable. Management mechanisms are provided in an EMP to ensure that the impacts of the Project are acceptable, and to appropriately deal with all waste generated from the facility.

It will be necessary to implement management measures to control and minimise potential impacts associated with the construction, operation and decommissioning phases of the ANMF site. The objective of these management measures, presented in the EIS as strategic measures for refinement and finalisation prior to the construction, operation and decommissioning phases, will be to ensure that the ANMF can be operated without significant adverse long-term impact on the environment in the vicinity of the proposed site. Some short-term impacts such as elevated dust, construction traffic and noise will occur but will be minimised through the proposed management measures.

The management measures and site monitoring required to ensure that potential impacts are identified and minimised are presented in the draft EMP prepared by the Proponent (refer to section 5 of the EIS).

5.2 Format of the EMP

An EMP will be prepared for both the construction and operation of the Project, the decommissioning being included within the Operation EMP. Each EMP will be structured as follows for each environmental element:

- Element – the environmental aspect of construction or operation requiring management consideration;
- Objective – the guiding operational objective that applies to the element;
- Performance Criteria – the mechanisms and actions through which the objective will be achieved;
- Strategy – the detail by which the success of the implementation of the policy will be determined;
- Monitoring and Reporting – the process of measuring actual performance, or how well the policy has been achieved, including the format, timing and responsibility for reporting and auditing of the monitoring results; and
- Corrective Action – the action to be implemented and by whom in the case where a performance requirement is not met.

5.3 Environmental Elements

The following table summarises the elements of the Project for which draft environmental management strategies have been prepared as part of the EIS process.

Project Element	Construction	Operation
Waste Management	X	X
Air Quality	X	X
Soil Management	X	X
Surface Water Management	X	X
Ground Water Management	X	X
Nature Conservation Management	X	X
Noise Management	X	X
Social and Community Management	X	X
Hazard and Risk Management	X	X
Cultural Heritage Management	X	X
Incidents Management	X	X
ANMF Decommissioning		X

5.4 Conclusion

Implementation of the Construction and Operation EMPs should ensure the effective management of environmental impacts of the Project. Monitoring measures proposed within the EMPs will gauge the success of that effectiveness and through reporting arrangements lead, where necessary, to appropriate corrective action being taken.

I note that the EMP's also include extensive monitoring and reporting requirements as well as the requirement for a complaints process that is managed by the contractor(s) and overseen by the Proponent.

The effectiveness of the EMPs will be able to be gauged through the monitoring and reporting protocols incorporated within the structure of the plans.

I therefore state the following condition:

Condition 15

- (1) EMPs must be prepared to address the construction and operational phases of the Project. A draft construction EMP must be submitted to the EPA for comment prior to the commencement of construction. The final operational EMP must be submitted to the EPA for comment at least 28 days prior to commissioning. Any comments from the EPA received within 21 days of each EMP being received, should be considered when implementing the EMP.
- (2) The EMPs must be generally consistent with the findings and conditions of this Report and the findings of the EIS. Construction work must not commence until the EPA has given written acceptance of those elements of the EMP relevant to the conditions set out in Appendix 2 of this Report.
- (3) Pursuant to s.41 of the SDPWO Act, I nominate the EPA as the concurrence agency for this condition.

6.0 Conclusion

Pursuant to s.35 of the *SDPWO Act*, I have evaluated the environmental effects of the Project through the material presented in the EIS process and state conditions as set out in this Report.

Having regard to the documentation and information provided during the EIS process for the proposed Project, I am satisfied that the requirements of the Queensland Government for impact assessment, in accordance with the provisions of Part 4 of the *SDPWO Act*, have been met.

The EIS process has provided sufficient information to all stakeholders to allow for a careful evaluation of the potential environmental impacts that could be attributed to the Project. In forming my decision, I had regard to the following materials:

- a) Moranbah Ammonium Nitrate Project Environmental Impact Statement Volumes 1 and 2 – GHD, August 2006;
- b) Moranbah Ammonium Nitrate Project Supplementary Environmental Impact Statement – GHD, December 2006;
- c) submissions on the EIS and Supplementary EIS received from individuals, companies and advisory agencies; and
- d) relevant Queensland legislation.

The conditions contained in this report establish the environmental requirements to enable construction of the project. The conditions are designed to control and limit potential impacts that may result from construction activities. These conditions apply to the whole Project site.

These conditions ensure that the project is undertaken by the Proponent in the manner described in the EIS and that DNAP fulfils the commitments made in the EIS and SEIS.

On the basis of the information provided, including advice from Advisory Agencies, I am satisfied that the adverse environmental impacts associated with the Project are able to be addressed through:

- Meeting the conditions for development approval pursuant to the *Integrated Planning Act 1997*, as presented in Appendices 1 and 2 of this Report; and
- Implementation of specific recommendations set down in Appendix 3 of this Report; and
- Implementation of the EMPs and commitments set down in the EIS for the Project.

I consider that, on balance, there is an over-riding need for the Project in terms of public benefits, which would accrue as a result of the value-adding to the State's natural resources, and associated employment, training, increased economic activity, taxes, royalties and other charges directly associated with development of the Moranbah Ammonium Nitrate Project. I therefore recommend that the Project, as described in detail in the EIS and SEIS, and summarised in Section 2 of this Report, can proceed, subject to the qualifications above.

Pursuant to s.39 of the *SDPWO Act*, I state for the Assessment Manager (Belyando Shire Council) for any relevant development approval application that is part of the Project and is a material change of use or requires impact assessment under the Integrated Development Assessment System of IPA, that the conditions set down

in Appendices 1 and 2 of this Report must attach to the relevant development approval for the Project.

In the event of any inconsistencies, the conditions and recommendations in this Report prevail. DNAP and its agents, lessees, successors and assigns, as the case may be, must implement the imposed conditions in this Report and seek to implement the recommendations in Appendix 3 of this Report and all commitments presented in the EIS.

Copies of this Report will be issued to the following entities:

- Dyno Nobel Asia Pacific Limited (DNAP), the Proponent, pursuant to s.35(5)(a) of SDPWO Act; and
- Belyando Shire Council, the Assessment Manager, pursuant to s.40 of SDPWO Act for an application for development approval under IPA.

A copy of this Report will be provided to all Advisory and Concurrence Agencies and will also be made publicly available on the DoI website, at www.infrastructure.qld.gov.au

Ken Smith
Coordinator-General
Date: May 2007

APPENDIX 1: General Conditions

Conditions pursuant to section 39 of the *State Development and Public Works Organisation Act 1971*.

Conditions provided by the Coordinator-General (CG) to be attached to the development approval granted by the Assessment Manager under the *Integrated Planning Act 1997 (IPA)*.

Condition 1

Dyno Nobel Asia Pacific Limited (DNAP) must collaborate in good faith with initiatives led by the Department of Mines and Energy (DME) or Anglo Coal Australia Pty Ltd (Anglo) (or any future holder of Mineral Development Licence 274 (MDL) or a coal Mining Lease (ML) over or adjacent to the Moranbah Ammonium Nitrate Manufacturing Facility (ANMF) property) to maximise opportunities to mine any coal under or around that property that would not significantly compromise the safety, operational or environmental management systems of the Moranbah Ammonium Nitrate Manufacturing Facility.

Condition 2

From the commencement of the water supply agreement between SunWater and Dyno Nobel Asia Pacific Limited, and then for the life of the Moranbah Ammonium Nitrate Manufacturing Facility, Dyno Nobel Asia Pacific Limited must supply at least 50 Megalitres (ML) per annum (pa) of raw water to the Belyando Shire Council (BSC) for use in Moranbah's town water supply.

Condition 3

- (1) Prior to the commencement of operation of the Moranbah Ammonium Nitrate Manufacturing Facility, Dyno Nobel Asia Pacific Limited must:
 - (a) provide permanent housing in Moranbah for its employees and their dependents; and
 - (b) at least 85% of this housing must be newly constructed dwelling units.
- (2) Belyando Shire Council will be responsible for monitoring compliance with this condition.

Condition 4

- (1) Before January 1 2008, Dyno Nobel Asia Pacific Limited will either:
 - (a) enter into an Infrastructure Agreement with the Department of Main Roads that defines cost sharing arrangements for the upgrade of the Moranbah Access Road - Peak Downs Highway intersection; or
 - (b) pay the Department of Main Roads an agreed amount as its contribution to the cost of that upgrade.
- (2) The final design of the intersection treatment will be decided by the Department of Main Roads, in consultation with Belyando Shire Council and Dyno Nobel Asia Pacific Limited, but will be generally in accordance with the CHR/CHL described in the Road Planning and Design Manual (RDMP).

- (3) In the absence of agreement between the Department of Main Roads and Dyno Nobel Asia Pacific Limited regarding Dyno Nobel Asia Pacific Limited's financial contribution to this intersection upgrade, the amount will be determined by the Coordinator-General, following discussions chaired by the Department of Infrastructure between, Dyno Nobel Asia Pacific Limited, the Department of Main Roads, Belyando Shire Council and any other relevant stakeholders determined by the Coordinator-General.

Condition 5

- (1) Within 90 days of commencement of construction of the Moranbah Ammonium Nitrate Manufacturing Facility under an *Integrated Planning Act 1997* Development Approval, Dyno Nobel Asia Pacific Limited shall complete construction of an access intersection from Goonyella Road to the construction camp with a Type BAR right turn treatment and a Type AUL(S) short left turn treatment in accordance with Chapter 13 of the Road Planning and Design Manual and provide temporary intersection lighting in accordance with Chapter 17 of the Road Planning and Design Manual.
- (2) The construction camp intersection need not be removed until either Dyno Nobel Asia Pacific Limited ceases to use the construction camp to accommodate personnel directly involved in scheduled annual maintenance, or the Moranbah Ammonium Nitrate Manufacturing Facility is decommissioned.
- (3) The construction camp intersection may never be permitted to become an alternative transport route for personnel, services or goods (other than as an emergency evacuation option) for the normal business of the Moranbah Ammonium Nitrate Manufacturing Facility.
- (4) Prior to the commencement of operation of the Moranbah Ammonium Nitrate Manufacturing Facility, Dyno Nobel Asia Pacific Limited shall complete construction of the main Moranbah Ammonium Nitrate Manufacturing Facility intersection with the Goonyella Road with a Type CHR (painted channelised right turn) treatment and a Type AUL left turn treatment in accordance with Chapter 13 of the Road Planning and Design Manual with the following minimum design elements:
 - a) 1.0m wide painted median to separate right turning traffic from the opposing northbound traffic stream;
 - b) 3.5m wide auxiliary right turn lane in the through road;
 - c) 3.5m wide through lane and a 1.5m wide shoulder for the southbound traffic on Goonyella Road;
 - d) 1.2m wide by 30m long raised concrete median in the side access road generally in accordance with Figure 13.84 of the Road Planning and Design Manual; and
 - e) full intersection lighting in accordance with Chapter 17 of the Road Planning and Design Manual.

Condition 6

- (1) Within 90 days of commencement of construction of the Moranbah Ammonium Nitrate Manufacturing Facility, Dyno Nobel Asia Pacific Limited under the under an *Integrated Planning Act 1997* Development Approval, Dyno Nobel Asia Pacific Limited is to initiate discussions with the Belyando

Shire Council, the Department of Main Roads and any other road user group nominated by the Coordinator-General, about the timing, design and capital cost sharing arrangements for an upgrade of the Moranbah Access Road intersection with Mills Avenue.

- (2) Following those discussions, Belyando Shire Council and the Department of Main Roads will jointly determine the final design and timing of construction of the intersection upgrade.
- (3) Prior to the Moranbah Ammonium Nitrate Manufacturing Facility becoming operational, Dyno Nobel Asia Pacific Limited will pay to Belyando Shire Council a capital cost contribution to the intersection upgrade.
- (4) In the absence of agreement between Belyando Shire Council and Dyno Nobel Asia Pacific Limited about the financial contribution to be made by Dyno Nobel Asia Pacific Limited to this intersection upgrade, the amount will be determined by the Coordinator-General, following discussions chaired by the Department of Infrastructure between Dyno Nobel Asia Pacific Limited, the Department of Main Roads, Belyando Shire Council and any other relevant stakeholders determined by the Coordinator-General.
- (5) The proportion of total intersection traffic that may be attributed to the Project is one relevant factor in the determination of the magnitude of the contribution that Dyno Nobel Asia Pacific Limited will make to the intersection upgrade.

Condition 7

Dyno Nobel Asia Pacific Limited will consult with Queensland Transport (QT), the Department of Main Roads, the Department of Emergency Services (DES) and all relevant local governments and Police Districts between the Port of Mackay and the Moranbah Ammonium Nitrate Manufacturing Facility site prior to all oversize transport movements associated with the construction of the Moranbah Ammonium Nitrate Manufacturing Facility.

Pursuant to the *Transport Operations (Road Use Management) Act 1995 - Transport Operations (Road Use Management—Mass, Dimensions and Loading) Regulation 2005*, Queensland Transport will be the Concurrence Agency for this Condition.

Condition 8

- (1) Prior to the commencement of the Moranbah Ammonium Nitrate Manufacturing Facility, Dyno Nobel Asia Pacific Limited shall:
 - (a) complete the Road Impact Assessment (RIA) for all nominated Project;
 - (b) if requested by the Department of Main Roads, enter into an Infrastructure Agreement to formalise mitigation measures and any annual payments; and
 - (c) pay the Department of Main Roads the first-year annual contribution identified in the Infrastructure Agreement.
- (2) At the 5 year anniversary of the commencement of operation of the Moranbah Ammonium Nitrate Manufacturing Facility, Dyno Nobel Asia Pacific Limited should submit a new Road Impact Assessment to the Department of Main Roads Central Highlands District Manager which covers the next five year period and which details any new mitigation measures and required changes to annual payments to cover pavement impacts.

- (3) During the operation of the Project, the proponent shall inform the Department of Main Roads Central Highlands District Manager of any proposed significant changes to the existing haulage routes, haulage volumes, vehicle impacts etc which may require significant variation of the Road Impact Assessment and any contribution to mitigating road impacts.

Condition 9

A transportation depot may be included on the Moranbah Ammonium Nitrate Manufacturing Facility property as part of the Project, provided that:

- (1) the business located at that depot is primarily the transportation of Ammonium Nitrate (AN) or Ammonium Nitrate Emulsion (ANE) from the Moranbah Ammonium Nitrate Manufacturing Facility;
- (2) a formal risk assessment for a depot facility is conducted in consultation with Belyando Shire Council, CHEM Services, the Explosives Inspectorate and the Department of Main Roads; and
- (3) major truck repairs, scheduled truck servicing, and truck refuelling are all undertaken off the Moranbah Ammonium Nitrate Manufacturing Facility property.

Condition 10

On commencement of construction of the Moranbah Ammonium Nitrate Manufacturing Facility under Development Application Integrated Planning Act 1997 (IPA) , Dyno Nobel Asia Pacific Limited and the Department of Main Roads will finalise agreement within 90 days and implement a Road-use Management Plant (RMP) via consultation with the Central Highlands District Manager of the Department of Main Roads.

Condition 11

- (1) All aspects of the design and operation of the Moranbah Ammonium Nitrate Manufacturing Facility will be compliant with Draft Explosives Information Bulletin 53 (, especially with respect to Ammonium Nitrate storage.
- (2) The Explosives Inspectorate of DME will be the Concurrence Agency for this condition.

Condition 12

Full development approval for the construction camp should be conditional upon:

- (1) Only workers involved with the design, construction, commissioning or maintenance of the Moranbah Ammonium Nitrate Manufacturing Facility being permitted to be resident there.
- (2) During the commissioning phase of the Moranbah Ammonium Nitrate Manufacturing Facility, only those workers directly involved in the commissioning work being permitted to be accommodated there.
- (3) Within 180 days of commencement of full scale Moranbah Ammonium Nitrate Manufacturing Facility operations:
 - a) use of the camp for worker accommodation should cease, except during each scheduled annual maintenance period for a maximum of 200 personnel for eight weeks per year; and

- b) accommodation buildings excess of those required to accommodate 200 people should be removed.

Condition 13

- (1) Prior to the commencement of operation of the Moranbah Ammonium Nitrate Manufacturing Facility, Dyno Nobel Asia Pacific Limited is to install and maintain both manual and automated warning systems at the Moranbah Enertrade Gas Compressor Station (EGCS), and all places of business located within 2km of the ammonia tank to warn of an ammonia gas release event (registering greater than 100ppm on any two internal Moranbah Ammonium Nitrate Manufacturing Facility monitoring devices).
- (2) Dyno Nobel Asia Pacific Limited is to ensure that any future underground coal mine air intake vents installed within 2km of the ammonia tank are equipped with air intake controls linked to ammonia gas detectors on the vent structure, to the Moranbah Ammonium Nitrate Manufacturing Facility control room, and to any automatic ammonia gas release event warning system. Dyno Nobel Asia Pacific Limited will cover the full cost of installation and maintenance of these control systems.
- (3) The manual and automated warning systems installed at locations outside of the Dyno Nobel Asia Pacific Limited facility will be treated as safety critical equipment and form part of the Safety Management System for the Moranbah Ammonium Nitrate Manufacturing Facility, which is subject to the approval of CHEM Services.

Condition 14

- (1) Prior to commencement of construction of the Moranbah Ammonium Nitrate Manufacturing Facility under an Integrated Planning Act 1997 (IPA) *Material Change of Use* (MCU), Dyno Nobel Asia Pacific Limited will request a determination from the Mines Inspectorate on any recommendations in the independent review of ground shock risk to underground mine structural integrity of the proposed Grosvenor Mine, northeast of the Moranbah Ammonium Nitrate Manufacturing Facility. Specifically, this determination would include a direction to Dyno Nobel Asia Pacific Limited on whether it should commission more detailed seismic modelling of ground shock from a potential explosion at the Moranbah Ammonium Nitrate Manufacturing Facility.
- (2) If more detailed modelling is commissioned, the Mines Inspectorate will evaluate the results of that work and determine whether any further special mitigating conditions need to be subsequently attached to the 'Licence to Manufacture Explosives' under section 38 of the *Explosives Act 1999*.

Condition 15

- (1) Environmental Management Plans must be prepared to address the construction and operational phases of the Project. A draft construction Environmental Management Plan (EMP) must be submitted to the Environmental Protection Agency for comment prior to the commencement of construction. The final operational Environmental Management Plan must be submitted to the Environmental Protection Agency for comment at least 28 days prior to commissioning. Any comments from the Environmental Protection Agency received within 21 days of each Environmental

Management Plan being received, should be considered when implementing the Environmental Management Plan.

- (2) The Environmental Management Plans must be generally consistent with the findings and conditions of this Report and the findings of the EIS. Construction work must not commence until the Environmental Protection Agency has given written acceptance of those elements of the Environmental Management Plan relevant to the conditions set out in Appendix 2 of this Report.
 - (3) Pursuant to s.41 of the SDPWO Act, I nominate the Environmental Protection Agency as the concurrence agency for this condition.
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APPENDIX 2: EPA Conditions

Conditions to which any Development Approvals given under the *Integrated Planning Act 1997* for the project for which the Environmental protection Agency is Assessment manager, are to be subject.

PART A – ENTIRE AMMONIUM NITRATE PROJECT

This includes the following Environmentally Relevant Activities (ERAs):

ERA 11(a) – Crude oil storing or petroleum product storing - crude oil or petroleum product in tanks or containers having a combined total storage capacity of 10 000 L or more but less than 500 000 L.

ERA 6(c) - Chemical manufacturing, processing or mixing – manufacturing or processing an inorganic chemical, organic chemical or chemical product, or mixing inorganic chemicals, organic chemicals or chemical products (other than mixing non-combustible or non-flammable chemicals or chemical products by dilution with water), in a plant or works having a design production capacity of 100 000t or more a year.

ERA 7(b) – Chemical storage – storing chemicals (other than crude oil, natural gas and petroleum products), including ozone depleting substances, gases, dangerous goods under the dangerous goods code in containers having a design storage volume of more than 1000 m³.

ERA 18(a) – Power station – generating power by consuming fuel at a rated capacity of 10 MW electrical or more if the fuel used is natural gas.

ERA 15(h) – Sewage treatment operating a special sewage treatment works having a peak design capacity to treat sewage of 21 or more equivalent persons.

ERA 17 – Fuel Burning – any process involving the use of fuel burning equipment (including, for example, a standby power generator, that is capable of burning (whether alone or in total) 500kg or more of fuel an hour.

ERA 62 - Concrete batching - producing concrete or a concrete product by mixing cement, sand, rock, aggregate or other similar materials in works (including mobile works) having a design production capacity of more than 100 t a year.

Agency Interest : General

G1	<p>In carrying out the environmentally relevant activities (ERAs), the holder must take all reasonable and practicable measures to prevent and / or to minimise the likelihood of environmental harm being caused. Any activity, that, if carried out incompetently, or negligently, may cause environmental harm, in a manner that could have been prevented, shall be carried out in a proper manner in accordance with the conditions of this approval.</p> <p><i>Note: This development approval authorises the environmentally relevant activities. It does not authorise environmental harm unless a condition contained within this approval explicitly authorises that harm. Where there is no condition or the authority is silent on a matter, the lack of a condition</i></p>
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	<i>or silence shall not be construed as authorising harm.</i>
G2	<p>Prevent and/or minimise likelihood of environmental harm.</p> <p>In carrying out an ERA to which this approval relates, all reasonable and practicable measures must be taken to prevent and / or to minimise the likelihood of environmental harm being caused.</p>
G3	<p>Records.</p> <p>Record, compile and keep all monitoring results required by this approval and present this information to the administering authority when requested.</p>
G4	All records required by this approval must be kept for 5 years.
G5	<p>Equipment Calibration</p> <p>All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this approval must be calibrated, and appropriately operated and maintained.</p>
G6	<p>Maintenance of Measures, Plant and Equipment.</p> <p>The operator of an ERA to which this approval relates must:</p> <p>(a) install all measures, plant and equipment necessary to ensure compliance with the conditions of this approval; and</p> <p>(b) maintain such measures, plant and equipment in a proper and efficient condition; and</p> <p>(c) operate such measures, plant and equipment in a proper and efficient manner.</p>
G7	The holder must ensure that an appropriately trained person(s) operates and maintains all plant and measures, including carrying out monitoring activities.
G8	No change, replacement or operation of any plant or equipment is permitted if the change, replacement or operation of the plant or equipment increases, or is likely to substantially increase, the risk of environmental harm above that expressly provided for by this approval.
G9	<p>Site Based Management Plan.</p> <p>From commencement of an ERA to which this approval relates, a site based management plan (SBMP) must be implemented. The SBMP must identify all sources of environmental harm, including but not limited to the actual and potential release of all contaminants, the potential impact of these sources and what actions will be taken to prevent the likelihood of environmental harm being caused. The SBMP must also provide for the review and 'continual improvement' in the overall environmental performance of all ERAs that are carried out.</p> <p>The SBMP must address the following matters:</p> <p>(a) Environmental commitments - a commitment by senior management to</p>

	<p>achieve specified and relevant environmental goals.</p> <ul style="list-style-type: none"> (b) Identification of environmental issues and potential impacts. (c) Control measures for routine operations to minimise likelihood of environmental harm. (d) Contingency plans and emergency procedures for non-routine situations. (e) Organisational structure and responsibility. (f) Effective communication. (g) Monitoring of contaminant releases. (h) Conducting environmental impact assessments. (i) Staff training. (j) Record keeping. (k) Periodic review of environmental performance and continual improvement.
<p>G10</p>	<p>Environmental Management System (EMS)</p> <p>The holder must implement and maintain an Environmental Management System (EMS) and keep a copy of relevant documentation which provides for the effective management by the holder of this authority of the actual and potential environmental impacts resulting from the carrying out of the activities, and that provides for at least the following functions:</p> <ul style="list-style-type: none"> (a) Staff training and awareness of environmental issues related to carrying out the activities, which must include at least: <ul style="list-style-type: none"> (i) The environmental policy of the holder, such that all persons that carry out the activities are aware of all relevant environmental commitments; and (ii) Any relevant environmental objectives and targets, such that all staff can work towards these; and (iii) Control procedures to be implemented for routine operations for day to day activities to minimise likelihood of any environmental harm being caused; and (iv) Contingency plans and emergency procedures to be implemented for non-routine situations to deal with foreseeable risks and hazards including corrective responses to prevent and mitigate environmental harm (including any necessary site rehabilitation); and (v) Organisational structure and responsibility to ensure that roles, responsibilities and authorities are appropriately defined to manage environmental issues effectively; and (vi) Effective communication to ensure two-way communication on environmental matters between operational staff and higher management; (vii) Their obligations in respect of monitoring, notification and record keeping obligations under the EMS and relevant authorities and/or development approvals; and (b) Monitoring of the release of contaminants into the environment including procedures, methods, record keeping and notification of results; (c) Conducting assessment of the environmental impact of any release of contaminants into the environment; (d) Periodic conduct of energy audits and at least annually, a review of

	<p>environmental performance and procedures adopted; and (e) Waste prevention, treatment and disposal; and (f) A program for continuous improvement.</p> <p><i>Note: Implementing an environmental management system that addresses these issues and is independently certified as conforming to ISO 14001:1996 (environmental management systems – specification with guidance for use) is one way of meeting these requirements.</i></p>
G11	<p>Notification.</p> <p>Telephone the EPA's Pollution Hotline or local office as soon as practicable after becoming aware of any release of contaminants not in accordance with the conditions of this approval.</p>
G12	<p>Spill Kit.</p> <p>An appropriate spill kit, personal protective equipment and relevant operator instructions/emergency procedure guides for the management of wastes and chemicals associated with the ERA must be kept at the site, and in each vehicle used if the activity is a mobile ERA.</p>
G13	<p>Spill Kit Training.</p> <p>Anyone operating under this approval must be trained in the use of the spill kit.</p> <p>Information About Spills.</p> <p>A written notice detailing the following information must be provided to the EPA within 14 days of any advice provided in accordance with condition [G11]:</p> <ul style="list-style-type: none"> (a) the name of the operator, including their approval / registration number; (b) the name and telephone number of a designated contact person; (c) quantity and substance released; (d) vehicle and registration details; (e) person/s involved (driver and any others); (f) the location and time of the release; (g) the suspected cause of the release; (h) a description of the effects of the release; (i) the results of any sampling performed in relation to the release, (j) actions taken to mitigate any environmental harm caused by the release; and (k) proposed actions to prevent a recurrence of the release.
G14	<p>All vehicles used to transport regulated waste must be registered with the administering authority.</p>
G15	<p>Annual Monitoring Report.</p> <p>An annual monitoring report must be prepared each year and presented to the administering authority when requested. This report shall include but not be limited to:</p> <ul style="list-style-type: none"> (a) a summary of the previous twelve (12) months monitoring results

	<p>obtained under any monitoring programs required under this approval and, in graphical form showing relevant limits, a comparison of the previous twelve (12) months monitoring results to both this approvals limits and to relevant prior results;</p> <p>(b) an evaluation/explanation of the data from any monitoring programs;</p> <p>(c) a summary of any record of quantities of releases required to be kept under this approval;</p> <p>(d) a summary of the record of equipment failures or events recorded for any site under this approval; and</p> <p>(e) an outline of actions taken or proposed to minimise the environmental risk from any deficiency identified by the monitoring or recording programs.</p>
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Agency Interest : Air

A1	<p>Nuisance.</p> <p>The release of noxious or offensive odours or any other noxious or offensive airborne contaminants resulting from the activity must not cause a nuisance at any nuisance sensitive or commercial place.</p>
A2	<p>Dust Nuisance.</p> <p>The release of dust and/or particulate matter resulting from the ERA must not cause an environmental nuisance at any nuisance sensitive or commercial place.</p>
A3	<p>Dust and particulate matter must not exceed the following levels when measured at any nuisance sensitive or commercial place:</p> <p>(a) Dust deposition of 120 milligrams per square metre per day, when monitored in accordance with Australian Standard AS 3580.10.1 of 2003 (or more recent editions); or</p> <p>(b) A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (μm) (PM10) suspended in the atmosphere of 150 micrograms per cubic metre over a 24 hour averaging time, at a nuisance sensitive or commercial place downwind of the site, when monitored in accordance with:</p> <ul style="list-style-type: none"> - Australian Standard AS 3580.9.6 of 2003 (or more recent editions) 'Ambient air - Particulate matter - Determination of suspended particulate PM10 high-volume sampler with size-selective inlet -Gravimetric method'; or - any alternative method of monitoring PM10 which may be permitted by the 'Air Quality Sampling Manual' as published from time to time by the administering authority.
A4	<p>When requested by the administering authority, dust and particulate monitoring must be undertaken to investigate any complaint of environmental nuisance caused by dust and/or particulate matter, and the results notified within 14 days to the administering authority following completion of monitoring. Monitoring must be carried out at a place(s) relevant to the potentially affected dust sensitive place and at upwind</p>

	<p>control sites and must include:</p> <p>(a) for a complaint alleging dust nuisance, dust deposition; and</p> <p>(b) for a complaint alleging adverse health effects caused by dust, the concentration per cubic metre of particulate matter with an aerodynamic diameter of less than 10 micrometre (μm) (PM10) suspended in the atmosphere over a 24hr averaging time.</p>
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Agency Interest : Land

L1	<p>Preventing Contaminant Release To Land.</p> <p>Contaminants must not be released to land.</p>
L2	<p>Spillage of all chemicals and fuels must be contained within an on-site containment system and controlled in a manner that prevents environmental harm.</p> <p>NOTE: All petroleum product storage's must be designed, constructed and maintained in accordance with AS 1940 - Storage and Handling of Flammable and Combustible Liquids.</p>

Agency Interest : Water

WA1	<p>Release To Waters</p> <p>Contaminants must not be released from the site to any waters or the bed and banks of any waters.</p>
WA2	<p>Stormwater Management</p> <p>There must be no release of stormwater runoff that has been in contact with any contaminants at the site to any waters, roadside gutter or stormwater drain.</p>
WA3	<p>Pond Conditions.</p> <p>All ponds used for the storage or treatment of contaminants, sewage or wastes at or on the authorised place must be constructed, installed and maintained:</p> <p>(a) so as to minimise the likelihood of any release of effluent through the bed or banks of the pond to any waters (including ground water);</p> <p>(b) so that a freeboard of not less than 0.5 metres is maintained at all times, except in emergencies; and</p> <p>(c) so as to ensure the stability of the ponds' construction.</p>
WA4	<p>Suitable banks and/or diversion drains must be installed and maintained to exclude stormwater runoff from entering any ponds or other structures used for the storage or treatment of contaminants or wastes.</p>

Agency Interest : Noise

N1	<p>Noise Nuisance.</p> <p>Noise from the ERA must not cause an environmental nuisance at any nuisance sensitive place or commercial place.</p>
N2	<p>Noise Monitoring.</p> <p>When requested by the administering authority, noise monitoring must be undertaken to investigate any complaint of noise nuisance, and the results notified within 14 days to the administering authority. Monitoring must include:</p> <ul style="list-style-type: none"> - LA 10, adj, 10 mins - LA 1, adj, 10 mins - the level and frequency of occurrence of impulsive or tonal noise; - atmospheric conditions including wind speed and direction; - effects due to extraneous factors such as traffic noise; and - location, date and time of recording.
N3	<p>The method of measurement and reporting of noise levels must comply with the latest edition of the Environmental Protection Agency's Noise Measurement Manual.</p>

Agency Interest : Waste

W1 All regulated waste removed from the site must be removed by a person who holds a current approval to transport such waste under the provisions of the *Environmental Protection Act 1994*.

Agency Interest : Social

S1	<p>Complaint Response.</p> <p>The operator of the ERA must record the following details for all complaints received and provide this information to the administering authority on request:</p> <ul style="list-style-type: none"> (a) Time, date, name and contact details of the complainant; (b) reasons for the complaint; (c) any investigations undertaken; (d) conclusions formed; and (e) any actions taken.
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PART B

ERA 6(c) - Chemical manufacturing, processing or mixing – manufacturing or processing an inorganic chemical, organic chemical or chemical product, or mixing inorganic chemicals, organic chemicals or chemical products (other than mixing non-combustible or non-flammable chemicals or chemical products by dilution with water), in a plant or works having a design production capacity of 100 000t or more a year.

ERA 7(b) – Chemical storage – storing chemicals (other than crude oil, natural gas and petroleum products), including ozone depleting substances, gases, dangerous goods under the dangerous goods code in containers having a design storage volume of more than 1000 m³.

Agency Interest : Air

A1	The release of contaminants to the atmosphere from a point source must only occur from those release points identified in Attachment 1 - Table 1 – ‘Contaminants Release to Air’ and must be directed vertically upwards without any impedance or hindrance.
A2	Contaminants must be released to the atmosphere from a release point at a height and a flow rate not less than the corresponding height and velocity stated for that release point in Attachment 1 - Table 1 – ‘Contaminants Release to Air’.
A3	Contaminants must not be released to the atmosphere from a release point at a mass emission rate/concentration, as measured at a monitoring point, in excess of that stated in Attachment 1 - Table 1 – ‘Contaminants Release to Air’ and monitored not less frequently than Attachment 1 - Table 2 – ‘Required Release Point Determinations’.
A4	The only feedstocks that may be used at the ammonia plant and burnt in fuel burning equipment are low sulphur coal seam methane gas containing not more than 10 ppb of sulphur.
A5	Effluent gases containing oxides of nitrogen from the Nitric Acid Plant must be collected and treated using Selective Catalytic Reduction (SCR) Unit prior to release to the atmosphere at release point A2. The removal efficiency of SCR must be not less than 90% at all times.
A6	All gaseous and particulate contaminants leaving the Prill Tower must be treated in a counter current flow scrubber and wet cyclone prior to release to the atmosphere at release point A1.
A7	Where any scrubber liquid is used for treatment of emissions, then the unit must be fitted with: <ul style="list-style-type: none"> (a) an equivalent back-up pump that must operate in event of failure of the primary pump; (b) a device to monitor the flow rate of scrubber liquor that must indicate by both visual and audible alarm functions any failure of scrubber liquor recirculation; and (c) a device to monitor the quality of scrubber liquor that must indicate by

	both visual and audible alarm functions any deterioration in scrubber liquor quality that adversely affects the effectiveness of the scrubber.
A8	The water supply to the scrubber must be provided from a header tank designed to supply four hours of water after power loss.
A9	All collected material removed from the scrubber described above must be recycled or disposed of in a manner that will not cause the release of contaminants to the atmosphere or to waters.
A10	Where any flare(s) is used for treatment of emissions, then all flares are to be operated to optimise combustion and minimize likelihood of smoky emissions and odours.
A11	<p>Monitoring of Contaminant Releases to the Atmosphere</p> <p>The holder of this approval must conduct and keep records of a monitoring program of contaminant releases to the atmosphere at the release points, frequency, and for the parameter specified in Attachment 1 - Table 2 – 'Required Release Point Determinations' and which complies with the following:</p> <p>(a) Monitoring provision for the release points listed in Table 2 must comply with the Australian Standard AS 4323.1 - 1995 "Stationary source emissions Method 1: Selection of sampling provisions".</p> <p>(b) The following tests must be performed for each required determination specified in Attachment 1 - Table 2:</p> <p>(i) gas velocity and volume flow rate;</p> <p>(ii) temperature and oxygen content;</p> <p>(iii) water vapour concentration</p> <p>(c) where practicable samples taken must be representative of the contaminants discharged when emissions are expected to be at maximum rates.</p> <p>(d) during the sampling period the following additional information must be gathered:</p> <p>(i) production rate or throughput of equipment served;</p> <p>(ii) electricity generation rate at the time of sampling;</p> <p>(iii) fuel type and consumption rate;</p> <p>(iv) number of generating units in use; and</p> <p>(v) reference to the actual test methods and accuracy's.</p>
A13	All release points referred to in Attachment 1 - Table 1 – 'Contaminant Release Limits to Air' must be conspicuously marked with the corresponding release point number.
A14	When requested by the administering authority, monitoring for relevant specified air quality indicators must be undertaken to investigate any complaint of environmental nuisance caused by a release to the atmosphere from a release point at the site, and the results thereof notified to the administering authority within 14 days following completion of monitoring. Air quality indicators and locations specified in the request must be relevant to the complaint.

A15	<p>Fugitive Emissions</p> <p>The holder of this environmental authority must ensure that all reasonable and practicable measures are taken in the design and operation of the plant to prevent, or if this is not practicable, minimise fugitive emissions. Reasonable and practicable measures include but are not limited to:</p> <ul style="list-style-type: none"> (a) implementation of a monitoring program to regularly leak test all componentry including pumps, piping and controls, vessels and tanks; (b) operating, maintenance and management practices to be implemented to mitigate fugitive sources; and (c) The ducting and extraction systems that transfer effluent gases from one location to another must be constructed, operated and maintained so as to minimise any leakage of effluent gases and vapours to the atmosphere occurring from these sources.
A16	<p>In the event of emissions of contaminants occurring from industrial plant or ducting and extraction systems that transfer effluent gases from one location to another, the fault or omission that resulted in that emission must be corrected forthwith.</p>
A17	<p>The holder of this development approval must develop and implement a greenhouse gas reduction strategy for the plant. The strategy must include items but not limited to the company's policy on greenhouse gas emissions, an energy efficiency program, a continuous improvement program, better control systems and the CO₂ recovery plan.</p>
A18	<p>The ammonia plant shall be operated to prevent releases of ammonia to the atmosphere.</p>

Agency Interest : Waste

W1	<p>Notification of Improper Disposal of Regulated Waste</p> <p>If the holder of this development approval becomes aware that a person has removed regulated waste from the licensed place and disposed of the regulated waste in a manner which is not authorised by this development approval or improper or unlawful, then the holder of this development approval must, as soon as practicable, notify the administering authority of all relevant facts, matters and circumstances known concerning the disposal.</p>
W2	<p>The holder of this development approval must develop and implement a water reuse strategy for wastewaters produced during the activity.</p>

PART C

ERA 18(a) – Power station – generating power by consuming fuel at a rated capacity of 10 MW electrical or more if the fuel used is natural gas.

Agency Interest : Air

A1	The emission of NO _x from each point of emission shall not be greater than 500mg/Nm ³ at Stack Testing Point.
A2	Stack testing of two emission points must be undertaken yearly so that each stack will be tested once every 4 years.
A3	Stack testing mentioned in 6 must be undertaken to determine concentrations of NO _x and CO vs CO ₂ .
A4	After initial commissioning and every 6 months thereafter the plant operator is to carry out internal monitoring of the plant to ensure plant is functioning to manufacture's specifications. Internal monitoring refers to the monitoring required and/*or recommended to ensure efficient operation. This may include measurement of parameters such as temperature, pressure, oxygen concentration and carbon monoxide concentration.
A5	When requested by the administering authority, monitoring and recording must be undertaken to investigate any complaint of contamination or environmental nuisance, and the results notified to the administering authority within 14 days following completion of monitoring.
A6	Monitoring of any releases to the atmosphere required by a condition of this approval must be carried out in accordance with the following requirements: (a) Monitoring provisions for the release points listed in Attachment 2 - Table 1 – 'Contaminant Release Limits to Air' must comply with the Australian Standard AS 4323.1 - 1995 'Stationary source emissions Method 1: Selection of sampling positions' (or more recent editions). (b) The following tests must be performed for each required determination specified in conditions A6 and A7 i. gas velocity and volume flow rate; ii. temperature; iii. water vapour concentration (moisture content). (c) Where practicable, samples must be taken when emissions are expected to be at maximum rates. (d) During the sampling period the following additional information must be gathered: i. production rate at the time of sampling; ii. raw materials used; iii. number of equipment and mixing vessels operating; iv. operating or mixing temperature; v. product made; and vi. reference to the actual test methods and accuracy of the methods.
A7	Contaminants must not be released to the atmosphere from a release point

	at a mass emission rate/concentration, as measured at a monitoring point, in excess of that stated in Table 1 and monitored not less frequently than Attachment 2 - Table 2 – ‘Required Release Point Determinations’.
A8	The only type of fuel to be burnt in power generation under normal operating conditions is low sulphur containing coal seam methane gas.

Agency Interest : Noise

N1	All noise from activities must not exceed the levels specified in Attachment 2 – Table 3 – ‘Noise limits at any nuisance sensitive or commercial place’.
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PART D

ERA 15(h) – Sewage treatment operating a special sewage treatment works having a peak design capacity to treat sewage of 21 or more equivalent persons.

Agency Interest : General

G1	<p>Trained / Experienced Operator(s).</p> <p>The daily operation of the waste water treatment system and pollution control equipment must be carried out by a person(s) with appropriate experience and/or qualifications to ensure the effective operation of that treatment system and control equipment.</p>
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Agency Interest : Land

L1	<p>Land Disposal.</p> <p>The only contaminants permitted to be released to land are treated effluent/stormwater to the areas shown in Figure 2A – Site Infrastructure.</p>
L2	<p>The treated effluent/stormwater released must be in compliance with the limits levels stated in Attachment 3 - Table 1 – ‘Contaminant Release Limits to Land’ and the conditions of this approval.</p>
L3	<p>The irrigation of effluent must be carried out in a manner such that:</p> <ul style="list-style-type: none"> (a) vegetation is not damaged; (b) soil erosion and soil structure damage is avoided; (c) there is no surface ponding of effluent; (d) percolation of effluent beyond the plant root zone is minimised; (e) the capacity of the land to assimilate nitrogen, phosphorus, salts, organic matter as measured by oxygen demand and water is not exceeded; and (f) the quality of ground water is not adversely affected.
L4	<p>Notices must be prominently displayed on areas undergoing effluent irrigation, warning the public that the area is irrigated with effluent and not to use or drink the effluent. These notices must be maintained in a visible and legible condition.</p>
L5	<p>Monitoring must be undertaken and records kept of a monitoring program of contaminant releases to the irrigation area at the monitoring points, frequency, and for the parameters specified in Attachment 3 - Table 2 – ‘Monitoring Program’.</p>
L6	<p>The daily volume of contaminants released to land must be determined or estimated by an appropriate method, for example a flow meter, and records kept of such determinations and estimates.</p>
L7	<p>When conditions prevent the irrigation of treated effluent to land (such as during or following rain events), the contaminants must be directed to a wet</p>

	weather storage or alternative measures must be taken to store/lawfully dispose of effluent (such as tanking off site to another treatment plant or sewer). A record must be kept of any removal or discharge off site, including destination, transporter, dates and volumes.
L8	Pipelines and fittings associated with the effluent irrigation system must be clearly identified. Lockable valves or removable handles must be fitted to all release pipes situated in public access areas.
L9	A minimum area of 3.5 hectares of land, excluding any necessary buffer zones, must be utilised for the irrigation of treated effluent/stormwater.
L10	Notwithstanding the quality characteristic limits specified in Attachment 3 - Table 1 – ‘Contaminant Release Limits to Land’, releases of effluent must not have any properties nor contain any organisms or other contaminants in concentrations that are capable of causing environmental harm.
L11	All irrigation areas are to be located above the Q10 flood level.

Attachment 1 - Table 1 - Contaminants Release to Air

Release point number	Minimum release height (metres)	Minimum velocity (m/sec)	Contaminant release	Maximum release limit ¹
A1-Prill Tower (Ammonium Nitrate Plant)	65	16	Particulates	1.85 grams/second
A2-Nitric Acid Vent	65	35	Oxides of Nitrogen	0.9 grams/second
A3-Reformer Furnace	30	19	Oxides of Nitrogen	1.3 grams/second

Note 1: The above NOx release limits are applicable during all timings except start-up, shut-down and calibration of emission monitoring devices. The start-up duration is allowed up to 30 minutes.

Attachment 1 - Table 2 - Required Release Point Determinations

Determination Required	Release Point Numbers	Frequency
Mass emission rate and concentration of particulates, ammonium nitrate, ammonia and nitric acid	A1-Prill Tower	Not less frequently than annually (see Note1)
Mass emission rate and concentration of oxides of nitrogen and ammonia	A2-Nitric Acid Vent	Not less frequently than annually (see Note1)
Mass emission rate and concentration of oxides of nitrogen (NOx) in the flue gas	A3-Reformer Furnace	Not less frequently than annually (see Note1)

Note 1: Within 6 months of commissioning the power station, the holder of this authority must conduct air emission monitoring to demonstrate compliance with air emission limits listed in Table 1.

Attachment 2 - Table 1 - Contaminants Release to Air

Release point number	Minimum release height (metres)	Minimum velocity (m/sec)	Contaminant release	Maximum release limit ¹
A4-Generator Stack	15	13	Oxides of Nitrogen	500 mg/N m ³ (dry) @5% O ₂ and 0.32 grams/second
A5-Generator Stack	15	13	Oxides of Nitrogen	500 mg/N m ³ (dry) @5% O ₂ and 0.32 grams/second
A6-Generator Stack	15	13	Oxides of Nitrogen	500 mg/N m ³ (dry) @5% O ₂ and 0.32 grams/second
A7-Generator Stack	15	13	Oxides of Nitrogen	500 mg/N m ³ (dry) @5% O ₂ and 0.32 grams/second
A8-Generator Stack	15	13	Oxides of Nitrogen	500 mg/N m ³ (dry) @5% O ₂ and 0.32 grams/second
A9-Generator Stack	15	13	Oxides of Nitrogen	500 mg/N m ³ (dry) @5% O ₂ and 0.32 grams/second
A10-Generator Stack	15	13	Oxides of Nitrogen	500 mg/N m ³ (dry) @5% O ₂ and 0.32 grams/second
A11-Generator Stack	15	13	Oxides of Nitrogen	500 mg/N m ³ (dry) @5% O ₂ and 0.32 grams/second
A12-Generator Stack	15	13	Oxides of Nitrogen	500 mg/N m ³ (dry) @5% O ₂ and 0.32 grams/second

Note 1: The above NO_x release limits are applicable during all timings except start-up, shut-down and calibration of emission monitoring devices. The start-up duration is allowed up to 30 minutes.

Attachment 2 - Table 2 - Required Release Point Determinations

Determination Required	Release Point Numbers	Frequency
Mass emission rate and concentration of oxides of nitrogen (NO _x) in the flue gas at 5 percent oxygen reference level	A4 to A12 inclusive - Generator Stacks	All stacks must be monitored within 6 months of commissioning of the facility (see Note1) and three stacks per year thereafter on rotational basis.

Note 1: Within 6 months of commissioning the power station, the holder of this authority must conduct air emission monitoring to demonstrate compliance with air emission limits listed in Attachment 2 - Table 1.

Attachment 2 – Table 3 - Noise limits at any nuisance sensitive or commercial place.

Noise level dB(A) measured as	Monday to Saturday			Sundays and public holidays		
	7am-6pm	6pm-10pm	10pm-7am	9am-6pm	6pm-10pm	10pm-9am
Noise measured at a ‘noise sensitive place’						
LA 10, adj, 10 mins	40	35	28	40	35	28
LA 1, adj, 10 mins	45	40	33	45	40	33
Noise measured at a ‘commercial place’						
LA 10, adj, 10 mins	45	40	33	45	40	33
LA 1, adj, 10 mins	50	45	38	50	45	38

Attachment 3 – Table 1 – Contaminant Release Limits to Land

Quality characteristics	Release Limit				
	Minimum	50th Percentile	80th Percentile	Maximum	Median
5-Day Biological Oxygen Demand (BOD)	-	-	-	20 mg/L	-
Total Suspended Solids	-	-	-	30 mg/L	-
Total Nitrogen	-	-	-	20 mg/L	-
Total Phosphorus	-	-	-	10 mg/L	-
Thermotolerant Coliforms	-	-	-	100 cfu/100ml	10 cfu/100ml
pH	6.5	-	-	8.5	-
Turbidity	-	-	-	5NTU	-
Free Chlorine	1 mg/L	-	-	-	-

Attachment 3 – Table 2 – Monitoring Program

Monitoring point	Quality characteristics	Units	Frequency
Release to irrigation system	Thermotolerant Coliforms	cfu/100ml	Fortnightly
Release to irrigation system	Biological Oxygen Demand	mg/L	Fortnightly (first 6 months) Monthly (duration of development approval)
Release to irrigation system	Suspended Solids	mg/L	Fortnightly (first 6 months) Monthly (duration of development approval)
Release to irrigation system	pH		Fortnightly
Release to irrigation system	Total Nitrogen	mg/L	Fortnightly (first 6 months) Monthly (duration of development approval)
Release to irrigation system	Total Phosphorus	mg/L	Fortnightly (first 6 months) Monthly (duration of development approval)
Release to irrigation system	Turbidity	NTU	Fortnightly (first 6 months) Monthly (duration of development approval)
Release to irrigation system	Free Chlorine	mg/L	Fortnightly (first 6 months) Monthly (duration of development approval)

APPENDIX 3: General Recommendations

The following section lists recommendations by the Coordinator-General in the Report evaluating the EIS for the Project to mitigate potential adverse impacts associated with specific components of the project.

Recommendation 1

- (1) During the first significant flow event of Grosvenor Creek following commencement of construction, Dyno Nobel Asia Pacific Limited should undertake studies of the aquatic biology of that Creek. Sampling should not be carried out during the period of first flush.
- (2) The methodology to be applied to the aquatic ecology studies should be consistent with that proposed within the EIS and should be discussed with EPA prior to implementation.
- (3) A copy of a report on the aquatic ecology monitoring is to be provided to the Regional Directors of both the EPA and the DPIF.
- (4) I nominate the Regional Director of DPIF as the responsible agency for monitoring compliance with this recommendation and deciding whether any follow-up monitoring is required.

Recommendation 2

- (1) No future amendments to the Belyando Shire Planning Scheme should allow residential development northwest of the Clermont railway line or within a 2.5km radius of the ammonia storage tank in any other direction from that tank; and
- (2) Any future development approvals granted by the Belyando Shire Council should specifically exclude permanent places of business unrelated to the operation of the Moranbah Ammonium Nitrate Manufacturing Facility being located within 1,750 m of the ammonia tank without the prior conduct of a comprehensive risk assessment, developed in close consultation with CHEM Services and the Explosives Inspectorate, which contains specific safety measures to protect against the potential impacts of both a large ammonia gas release event and an AN explosion event.

Recommendation 3

Any future Mining Lease granted over existing Mineral Development Licence 274 should state the following conditions:

- (1) All permanently staffed buildings or buildings that house critical control equipment located within 1,750 m of Dyno Nobel Asia Pacific Limited's Ammonium Nitrate prill storage area should be subject to a risk assessment, conducted in consultation with CHEM Services and the Explosives Inspectorate.
- (2) Storage of explosives and establishment of workforce accommodation or mine site administration facilities should not be built within 1,750 m of Dyno Nobel Asia Pacific Limited's Ammonium Nitrate prill storage area.

APPENDIX 4: Definitions

“Advice/Advisory Agencies” means an advice agency under the *Integrated Planning Act 1997*.

“Anglo” means Anglo Coal Australia Pty Ltd

“ANMF” means the Moranbah Ammonium Nitrate Manufacturing Facility.

“ANMF property” means the freehold property upon which the proposed AMNF is situated.

“AN” means Ammonium Nitrate.

“ANE” means AN Emulsion

“AS” means Australian Standard.

“AUL” means Auxiliary Left

“AUR” means Auxiliary Right

“BMA” means BHP Mitsubishi Alliance Pty Ltd.

“BSC” means Belyando Shire Council.

“CG” means The Coordinator-General of the State of Queensland.

“CH4” means Methane (major component of coal seam gas).

“Type CHL” means raised channelised left turn treatment.

“Type CHR” means raised channelised right turn treatment.

“CHEM Services” means Chemical Hazards and Emergency Management Services unit of The Department of Emergency Services – Queensland

“CHMP” means Cultural Heritage Management Plan.

“CICG” means Coal Industry Coordination Group – Queensland

“CIHG” means Coal Industry Housing Group – Queensland

“CO” means Carbon monoxide.

“CO₂” means Carbon dioxide.

“DA” means a development approval under the *Integrated Planning Act 1997 (QLD)*

“DEH” means The Department of the Environment and Heritage - Commonwealth.

“DES” means The Department of Emergency Services – Queensland

“DEWR” means the Department of Environment and Water Resources - Commonwealth)

“DGSM Act” means *Dangerous Goods Safety Management Act and Regulation 2001* - Queensland

“DME” means The Department of Mines and Energy - Queensland

“DMR” means The Department of Main Roads - Queensland.

“DNAP” means Dyno Nobel Asia Pacific Limited.

“DNL” means Dyno Nobel Limited

“DNRW” means The Department of Natural Resources and Water – Queensland.

“DoH” means The Department of Housing – Queensland.

“DoI” means The Department of Infrastructure – Queensland.

“DPIF” means The Department of Primary Industries and Fisheries - Queensland.

“EGCS” means Enertrade Gas Compressor Station.

“EIA” means Environmental Impact Assessment.

“EIB53” means Draft Explosives Information Bulletin No 53 – 2007, The Department of Mines and Energy - Queensland

“EIS” means Environmental Impact Statement.

“EMP” means Environmental Management Plan.

“Enertrade” means Enertrade Pty Ltd.

“EP” means Environmental protection.

“EP Act” means *Environmental Protection Act 1994 (Qld)*.

“EPA” means The Environmental Protection Agency - Queensland.

“EPBC Act” means *Environmental Protection and Biodiversity Conservation Act 1999 (Cwlth)*.

“EPP” means Environmental Protection Policy.

“ERA” means Environmentally Relevant Activity.

“ERPG” means Emergency Response Planning Group.

“GHD” means GHD Pty Ltd, Dyno Nobel’s principal consultant for the Project.

“GHG” means Greenhouse gas.

“GLS” Goonyella Lower coking coal Seam.

“GMS” Goonyella Middle coking coal Seam.

“ha” means hectares.

“HIPAP” means Hazardous Industry Planning Advisory Paper.

“HRA” means Hazard and Risk Assessment

“IAS” means Initial Advice Statement as used in the *State Development and Public Works Organisation Act 1971*.

“IDAS” means Integrated Development Assessment System of Schedule 10 of the *Integrated Planning Act 1997 (Qld)*.

“IPA” means *Integrated Planning Act 1997 (Qld)*.

“MCU” means Material Change of Use according to section 1.3.5 of the *IPA Act*.

“MDL” means Mineral Development Licence

“MGMG” means Moranbah Growth Management Group.

“MHF” means Major Hazard Facilities.

“ML” means Megalitres or Mining Lease

“MSDS” means Material Safety Data Sheet.

“MW” means Megawatt.

“NCA” means *Nature Conservation Act 1992 (Qld)*.

“NEPM” means National Environmental Protection Measure.

“NES” means National Environmental Significance

“NH₃” means Ammonia.

“NA” means Nitric acid.

“NH₄NO₃” means ammonium nitrate.

“Nodule” means a natural concretion.

“NOHSC” means National Occupational Health and Safety Commission.

“NOx” means Oxides of Nitrogen.

“NO₂” means Nitrogen Dioxide.

“NQGP” means Enertrade Pty Ltd’s high pressure North Queensland Gas Pipeline

“m/s” means metres per second.

“pa” means Per annum.

“PJ/a” means Petajoules/year.

“PLL” means Potential Loss of Life.

“PM₁₀” means Particles smaller than 10 micrometres.

“PPE” means Personal Protection Equipment.

“PRA” means Preliminary Risk Assessment.

“Project” means Moranbah Ammonium Nitrate Project
“PSA” means Pressure Swing Adsorption.

“QLD” means Queensland.

“QRA” means Quantitative Risk Assessment.

“QT” means Queensland Transport - Queensland

“RPDM” means Road Planning and Design Manual – MDR, Queensland.

“Report” means “The Coordinator-General’s EIS Evaluation Report on the EIS for the proposed Moranbah Ammonium Nitrate Project”

“RMP” means Road-Use Management Plan.

“RO” means Reverse osmosis.

“RIA” means Road Impact Assessment

“SDPWO Act” means *State Development and Public Works Organisation Act 1971 (Qld)*.

“SEIS” means Supplementary EIS; Dyno Nobel Ammonium Nitrate Plant: Supplementary Report for the proposed Moranbah Ammonium Nitrate Project: Responses to issues Raised: December 2006

“SMS” means Safety Management System.

“SSAN” means Security Sensitive Ammonium Nitrate.

“SOx” means Oxides of Sulphur.

“State” means the State of Queensland.

“T” means Tonnes.

“ToR” means Terms of Reference as used in the SDPWO Act.

“Tpa” means Tonnes per annum.

“Tpd” means Tonnes per day.

“TSP” means Total Suspended Particulates.

“V” means Volts.

“WWTP” means Waste Water Treatment Plant.