



Queensland Government
State Development

TERMS OF REFERENCE

June 2001

ENVIRONMENTAL IMPACT STATEMENT

FERTILIZER PLANT PICKANJINNIE

QUEENSLAND

PROPONENT:

QUEENSLAND FERTILIZER ASSETS PTY LTD

Section 29B

State Development & Public Works Organisation Act 1971

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Terms of Reference for the Preparation of an

Environmental Impact Statement (EIS) for the Construction of a Fertilizer Plant

APPLICANT:	Queensland Fertilizer Assets Pty Ltd (QFAL)
LOCATION:	Lots 208 and 209, RP835683 and Lot 210, WAL53390. Corner Warrego Highway and Pickanjinie North Road, approximately 34 km east of Roma.
AREA:	200 hectares
LOCAL GOVERNMENT:	Bendemere Shire Council

Introduction

Queensland Fertilizer Assets Pty Ltd (QFAL) is undertaking a number of feasibility studies in respect of the establishment and operation of a world class fertilizer plant on a site at Pickanjinie in the Shire of Bendemere. The study into the examination of the environmental impacts of the proposal is one of these studies. Commercial, technological and financial studies are being undertaken at the same time as this study. The plant will have the capacity to produce up to 350,000 tonnes per annum of Granular Urea, 360,000 tonnes per annum of Anhydrous Ammonia, 130,000 tonnes per annum of Nitric Acid, and 150,000 tonnes per annum of low density Ammonium Nitrate. Distribution of the product will be within Australia, primarily in Queensland and New South Wales, and is expected to be to the agricultural (urea and anhydrous ammonia), mining (ammonium nitrate), and chemical (anhydrous ammonia and nitric acid) industries. The plant will utilise natural gas as feedstock for the process. The proposal represents a capital investment of \$600M and will provide employment for up to 500 persons during construction and 150 persons during operations.

The Co-ordinator General requires QFAL to take account of the environmental effects of the proposal in accordance with section 29B of the *State Development and Public Works Organization Act, 1971 (Qld)*. As a consequence, QFAL is required to prepare an Environmental Impact Statement (EIS) and the Co-ordinator General has decided that the Department of State Development will be the Responsible Authority to manage the preparation of the EIS.

The Terms of Reference for the EIS have been prepared to conform with State and Local Government requirements. The proposal is not a controlled action pursuant to the *Environment Protection & Biodiversity Conservation Act 1999*. The proposal will require the approval of the Bendemere Shire Council pursuant to the *Integrated Planning Act 1997*. If investment in the proposal is from a foreign source, the approval of the Foreign Investment Review Board is required.

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Description of Elements within the Environmental Impact Statement

1. EXECUTIVE SUMMARY

The function of the summary is to provide a succinct overview of the proposal and convey the fundamental aspects discussed in the main body of the document and the options relating to the proposal. The structure of the summary should generally follow that of the EIS although focus strongly on the critical issues. The summary should include:

- title of the project;
- name and address of proponent/s;
- a brief discussion of the proposal:
 - project objectives;
 - the purpose of the impact assessment study, especially whether it is a part of a feasibility study and the level of organisational commitment to the project;
 - the site location and location(s) of associated infrastructure (including map);
 - major physical features of the plant;
 - the nature of feedstocks and their sources;
 - water supply requirements;
 - power supply requirements, including power transmission line supply routes;
 - method of transportation of materials to construct buildings and plant, and the proposed route(s);
 - method of transportation and proposed routes for materials input and product output for the operational phase of the plant; and
 - project requirements associated with construction and operation of the proposal (including workforce infrastructure and social requirements).
- a brief discussion of the alternatives (including location if applicable) and reasons for selecting the preferred option(s);
- anticipated project schedule timelines and milestones for construction, commencement of operation and decommissioning;
- a brief examination of the social and economic consequences of the proposal not proceeding;
- a brief description of the existing environment including physical (natural and built), biological, social, cultural and economic environments;
- a description of the principal impacts on the built and socio-economic environments, including workforce housing;
- a description of the principal environmental impacts of the proposal (both adverse and beneficial); and
- a summary of the environmental protection measures, safeguards and monitoring and reporting procedures proposed.

The Executive Summary should succinctly describe the EIS process pursuant to section 29B of the *State Development and Public Works Organisation Act*

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1971, state that this process replaces that provided for in the *Integrated Planning Act 1997*, but does not replace the need for a development application to be lodged, consideration and decision by Council and that appeal rights pursuant to Council's decision will be afforded to those who lodged a submission to the EIS available for public review pursuant to the *State Development and Public Works Organisation Act 1971*.

The Executive Summary will be placed on the Department of State Development website as part of the consultation process.

2. INTRODUCTION

The function of the Introduction is to explain why the Environmental Impact Statement (EIS) has been prepared, what it sets out to achieve, and define the readers to whom it is directed. Factual information contained in the document should be referenced wherever possible.

Where the EIS is being prepared as part of the feasibility studies for a project this should be clearly stated and the level of organisational commitment to the project should be given.

Should the Proponent require any information in the report to remain confidential, it should be clearly indicated and a separate report prepared on these matters.

2.1 The Proponent

This section describes the Proponent in terms which are relevant to the proposed development. Details outlining the experience of the Proponent in constructing and operating plants of the proposed type should be included. The level of organisational commitment to the project should be articulated.

2.2 Proposed Development

Provide a brief project description, including major associated infrastructure. Note that a full description of the project will be given in the Section 3: "**Description of The Proposal**".

A brief description should be provided of studies or surveys which have been undertaken for the purposes of developing the proposal and preparing the EIS.

2.3 Objectives and Scope of the Environmental Impact Statement

A succinct statement should be made of the objectives of the EIS. The structure of the report can then be outlined as an explanation of how the report will meet its objectives. In brief, the purpose of the document is to provide public information on the need for, and likely effects of, the proposal, and to demonstrate that environmental impacts could be managed to protect the environment in an appropriate way. Project impact on the environment should be within limits perceived as acceptable to the community. Discussion of options and alternatives is a key aspect of the EIS.

2.4 Environmental Impact Statement Process

This section should detail the EIS process pursuant to section 29B of the *State Development and Public Works Organisation Act 1971*, state that this process replaces that provided for in the Integrated Planning Act, but does not replace the need for a development application to be lodged, consideration and decision by Council and that appeal rights pursuant to Council's decision will be afforded to those who lodged a submission to the EIS pursuant to the *State Development and Public Works Organisation Act 1971*.

The process may be described in words or diagrams.

Project timelines describing milestones must be described including pre-decision to proceed stages through pre-construction and construction and operation.

3. DESCRIPTION OF THE PROPOSAL

The objective of this section is to fully describe the proposal through a lifetime of construction, operation, and final decommissioning and rehabilitation. Proposed land use following decommissioning should be discussed. Details on environmental control strategies should not be presented here, but should be presented in the later section on "***Environmental Impacts***".

3.1 Background

3.1.1 Need for the Development

This subsection describes what the project aims to achieve, why there is a need for the proposal and what alternatives exist to achieve the stated objectives. Financial, environmental and social aspects should be discussed as necessary.

3.1.2 Alternatives Considered

All prudent and feasible alternatives to the proposal (or aspects of the proposal) should be discussed in sufficient detail to enable an understanding of the rationale for selection of a preferred option.

The consequences of not proceeding with the project should be briefly discussed.

3.1.3 Rationale for the Preferred Alternative

Description of the rationale underlying the selection of the proposal.

3.1.4 Conformity of the Proposal with the National Strategy on Ecologically Sustainable Development

Issues relating specifically to the Australian *National Strategy on Ecologically Sustainable Development* could be discussed in this section on an issue-by-issue basis, or alternatively they could be summarised in an appendix.

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Suggested topics for facilitating assessment of the project's compatibility with some aspects of ESD are:

- expected life of the project and planning for life of project waste storage capacities and decommissioning;
- rehabilitation of the site and provisions for the ongoing management of any contaminated land and post project land use;
- recycling and/or reuse of non-renewable resources such as, methane gas, oils, water, paper, plastics, metals. Commitment to development of an operational waste management plan at some time in the future will not allow decision makers to assess this aspect at the Impact Assessment stage;
- life of project greenhouse gas emissions: Does the proposal include design for maximum containment of the emissions or other waste products? Comment on how the proposal itself contributes towards limiting greenhouse gas emissions or enhancement of greenhouse gas sinks (*Queensland Greenhouse Response Strategy 1995*); and

include summary table of life of project inputs and outputs highlighting renewable and non renewable resource consumption. Mass balance of inputs and outputs for major or high risk elements should be undertaken.

3.2 Location

A map should be provided showing the location of the facility in a regional and State wide context, the sub-catchment within which the proposal lies, and resources and natural features in relation to infrastructure (both existing and proposed). The physical relationship of the site with respect to process feedstocks should be shown.

This section should include a description of the site selection criteria.

3.3 Land Tenure

Include the Real Property Description of the site and the date upon which the land was freeholded.

3.4 Layout and Scale of Plant

The purpose of this section is to provide information regarding the location of the building and activity areas to enable an understanding regarding the interrelationships between the two.

Include a layout plan which indicates the location of buildings, storage areas, carparking areas, vehicular movement areas and other areas which contribute to the operation of the development proposal.

3.5 Feedstock

Include details of the types, sources, quantities and methods of transportation of feedstock materials. Transportation routes for feedstock should also be

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identified. Provide information on the origin of natural gas for the project. The location of the supply pipeline should be included here.

If off-site infrastructure is being considered, provide details of pipeline routes required for supplying the site with water or gas. If a pipeline is not part of this EIS process, state which process will consider the impacts of the particular pipeline.

3.6 Materials Processing

The location and nature of the processes to be used should be described including a description of the plant and equipment to be employed, their capacity, chemicals to be used, and measures proposed to contain and record chemical spills and other similar events. A process flow-sheet should be provided showing the anticipated rates of input of all materials into the plant on a daily or annual basis, along with similar data on products, wastes and recycle streams (where this information is available) so as to permit preparation of approximate material balances for the plant.

The location of identical or similar plants in Australia, or elsewhere, should be included in the EIS.

Describe all activities, including chemical and mechanical, to be conducted on site (e.g., chemical processing, chemical storage, sewage treatment, power generation, fuel burning, mechanical workshop).

Describe the amount and characteristics of solid and liquid waste produced on site.

Describe any waste treatment process involved, including site drainage and erosion controls.

Describe and show on the map run-off/stormwater discharge points.

A process flow sheet must be provided and accompanied by a table indicating where the potential impacts and management strategies for each waste stream are addressed in the EIS.

Details of any hazardous materials to be stored and/or used in processing should be given including:

- the name of the material and sufficient information to clearly identify it (including the chemical name, the UN number and any trade names);
- the classification of the material according to the Australian Dangerous Goods Code (including packaging group) and any subsidiary risk;
- the maximum quantity of the material in storage and within the process at any one time;
- a plan showing the location of the material within the buildings and on the site; and
- any other information that is relevant.

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In addition to details of hazardous materials to be stored and/or used in processing, provide their Material Safety Data Sheets and environmental toxicity data and biodegradability for raw materials and final products.

3.7 Product Outputs

Describe the nature of the product and the rate of output.

3.8 Product Destinations

Describe in writing and by way of a map, how and where the product will be distributed. Describe the type of vehicles which will be used, their length gross mass, and whether the vehicles have or have not a road friendly axle.

3.9 Safety Systems

A description should be provided of the proposed safety systems, including:

- design and operation of the systems;
- fire prevention and protection systems;
- leak detection and minimisation systems; and
- emergency shutdown systems and procedures.

3.10 Greenhouse Gas & Adaptation to Climate Change

An examination of the effect of the project on Greenhouse gas emissions in the national context should be provided.

Provide an inventory of projected future annual emissions for each Greenhouse Gas and total emissions expressed in CO₂ equivalent terms for each component of the project and for the combined total project.

3.11 Land Contamination

An assessment of the site will need to be undertaken and appropriate management strategies will need to be included in the Draft Environmental Management Plan.

3.12 Decommissioning

This section should describe the anticipated life of the proposed development and the proposed decommissioning and rehabilitation strategies. Potential alternative strategies should be outlined. Included in the decommissioning plan should be the proposed future uses of the land.

4. OFF-SITE AND ON-SITE INFRASTRUCTURE REQUIREMENTS

4.1 Introduction

This section is intended to provide information on the infrastructure requirements of the proposal during construction and operation.

Each section should detail on-site and off-site requirements for infrastructure under separate subheadings.

4.2 Natural Gas Feedstock

Gas supply requirements for the operation of the facility should be discussed, including anticipated dates for the start of gas supply and commissioning. Details should include:

- proposed method of supply;
- quality of supply;
- maximum and minimum demand;
- annual consumption; and
- interruptibility criteria.

In the event of a pipeline being the preferred option state when the pipeline needs to be commissioned.

The proposed route should be described and shown on a map. In this regard the report should identify the route, length, and width of any proposed transport corridor. Details should include proposed method of acquisition of the corridor land, who may construct, operate and own any proposed pipeline. The report should also identify whether any such pipeline corridor crosses or interferes with any existing transport infrastructure (ie road, railway, oil and/or gas pipeline).

4.3 Water Management

Determination of raw and treated water demand should be made for both the construction and operation phases of the project, including details of:

- water usage within the site;
- feasibility of water recycling and water conservation and management measures;
- sources of water supply;
- the quality (microbiological and chemical) of the sources of water supply;
- proposed methods of treating on-site potable water to meet drinking water standards;
- the storage and distribution of potable water on-site;
- estimated rates of supply, both average and maximum flow rates on daily and annual bases;
- daily or seasonal peak demand requirements; and
- ultimate total annual requirements.

This assessment should take into account the requirements of the project for fire fighting or other emergency water supply.

A description should be provided of the proposed site stormwater drainage system and its proposed management. An examination should be presented of practical means to avoid allowing run-off to be contaminated by raw materials, waste or products.

Water treated on-site will be for plant purposes only, there will be no reticulation of water off-site.

4.4 Solid Waste Management

This section should cover the disposal of all site solid waste for both the construction and operational phases of the project.

Information should be provided on the type, nature and amount of wastes that will be generated and the methods of recycling, reuse and disposal.

The predicted physical and chemical properties of process wastes should be given.

The location and method of disposal of solid wastes should be detailed including:

- location of treatment facilities;
- transport to treatment facilities; and
- method of waste tracking.

Details of the proposed strategy for waste management should be described in the section "**Environmental Impacts**".

4.5 Liquid Waste Disposal

A description should be presented of the source, quality and quantity of wastewaters originating from the facility.

Details on wastewater minimisation, treatment (including recycling) and disposal should be presented in the section on "**Environmental Impacts**" rather than this section.

Where on-site disposal of liquid waste is required, the following details should be given:

- design and dimensions of ponds;
- materials and methods of construction proposed to prevent seepage and contamination;
- erosion control measures to ensure stability of any disposal area; and
- the methods of storage, treatment and disposal of sewage.

4.6 State Controlled Roads

This and the following section need to identify the roads which may be affected by the construction and operation of the proposal.

Information required in order to identify the anticipated impacts on these roads should include the provision of details on the following matters:

- type of materials to be transported;
- input / output products;
- origins and destinations;
- routes;
- modes;
- tonnage;
- axle loadings;
- average trips per week;
- timing;

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- identification of sections of routes which may cause difficulties; and
- hours of operation for all transportation activities.

This information should be presented in tabular form in order to facilitate its interpretation.

A map should be included identifying the proposed routes and vehicle movements.

4.7 Local Government Controlled Roads

Information similar to that provided in the section '**State Controlled Roads**' should be included here.

4.8 Rail

Include information regarding the intended use of Queensland Rail Infrastructure.

The information criteria are similar in principle to those of the subsection '**State Controlled Roads**'.

4.9 Electricity

Electricity supply requirements for the construction and operation of the facility should be discussed, including anticipated dates for the start of construction (in relation to electricity supply needs), testing of plant and final commissioning. Details should include information on:

- maximum and minimum demand;
- annual energy consumption; and
- interruptibility criteria.

Information should be supplied on any aspect of the operation of the plant which could cause interference to electricity supply by way of harmonic currents, sudden load changes, reactive power demands or any other cause and if so, what steps will be taken to ensure that no unacceptable level of interference will be introduced into the general electricity supply system.

If electric power is to be generated on the site, information should be given about:

- how and in what quantities power is to be generated;
- what fuel will be used;
- what emissions are anticipated from such generation; and
- whether operation in parallel with the State grid is contemplated.

If the export of active or reactive power is proposed to take place from the plant then the measures which will be taken to control voltage and the export should also be discussed.

4.10 Telecommunication

Details of the proposal's telecommunication requirements, sources and method(s) of reticulation should be provided.

4.11 Land Tenure of Proposed Infrastructure Routes

This section should provide details of the tenure of existing infrastructure routes for off-site services and the tenure of any proposed infrastructure routes (e.g. gas supply, electricity supply).

5. TRANSPORTATION REQUIREMENTS

5.1 Introduction

This section should provide details on the transport arrangements during both the construction phase and the operational phase of the project.

5.2 Roads

5.2.1 State Controlled Roads

Information should be provided on road transportation requirements including:

- the types and quantities of goods to be moved (construction materials, plant resources, wastes, products, dangerous goods and hazardous materials);
- method of movement - describe the type of vehicles which will be used, their length, gross mass, and whether the vehicles have or have not a road friendly axle
- anticipated times at which movements may occur;
- details of transport of heavy and over-size indivisible loads (including types and composition);and
- the proposed transportation routes.

Information presented in previous sections with respect to transportation should be referenced.

Information should also be provided in relation to employee generated traffic including origin and destination of movements for both the construction and operational phases.

5.2.2 Local Government Controlled Roads

Provision of details as described under '**State Controlled Roads**' for Local Government controlled roads.

5.3 Rail

Indicate any use which may be made of rail transport and associated facilities for both raw materials and products. Detail the types of goods carried, frequency and magnitude of rail shipments, their routes and ultimate source or destination.

The study will need to describe:

- the use of any existing rail track or the use of any intermodal terminal in close proximity to existing track;
- any capital upgrade required to track and loading and unloading facilities;
- the route of any new track;
- layouts for loading and unloading facilities;
- number and configuration of trains to be used along with frequency, tonnage, and timing; and
- transport of dangerous goods by rail.

Rail access to the site via an at-grade highway open level crossing may not be suitable due to the volume of product proposed to be transported. As such alternative options such as conveyors or pipeline should be explored.

Suitable arrangements will have to be made with the relevant rail manager in respect of all aspects of the proposal which affect rail infrastructure and operations. Also any relevant financing and funding issues related to the provision of rail infrastructure for the proposal should be described.

5.4 Sea

Indicate any use which may be made of port facilities for both raw materials and products. Describe the types of ships and port facilities likely to be used for the project. The number of shipping movements per year and the timing of those movements should also be estimated. Project related operational matters concerning the port, wharves and berths, and unloading and loading facilities should be described, including the transport routes taken to and from the port. Any environmental impact at the port and in its environs should be detailed. Any special or unusual requirement for shipping should also be detailed.

5.5 Air

Describe any use of air transport associated with the project, including the movement of goods and personnel, and the airports/aerodromes to be used.

6. WORKFORCE AND FAMILY REQUIREMENTS

6.1 Introduction

This section will provide details on the number, composition and sources of the construction and operating workforce.

6.2 Number and Composition

Provide a description of the project construction and operating workforce requirements in terms of numbers and skills. A graph identifying the relationship between workforce numbers and timelines should be provided.

6.3 Sources of the Workforce

Provide a description of the possible and likely sources of the construction and operating workforce. A description of the likely demographics of the construction and operational workforces should be provided so that the potential of the local region to meet the project requirements can be determined. Where the workforce needs cannot be met locally or regionally, a description of how the project needs may otherwise be met should be provided.

Any new skills and training to be introduced in relation to the project should be identified, as well as the need for supplementation of any existing training programs. Adequate provision should be made by the Proponents for apprenticeship and worker training schemes.

Analyses of the issues covered in this section should include consideration of other major developments proceeding in the Shire, and their potential impacts on this proposal.

6.4 Accommodation

Provide a description of the likely accommodation needs of the workforce based on the workforce demographics described in '**Sources of the Workforce**'. This section should include a description of the means of transporting the workforce to and from the project site.

7. SAFETY MANAGEMENT

7.1 Hazard Analysis and Risk Assessment

A hazard and risk analysis should be conducted in relation to the production, processing, use, storage and transportation of hazardous materials (ammonia, nitric acid, ammonium nitrate and any other hazardous materials to be produced, processed, used, stored or transported). These studies should focus on the materials and processes that, in the event of an emergency situation have the potential to cause injury or damage beyond the boundaries of the facility. All phases of operation should be considered, including construction, commissioning, operation, maintenance and decommissioning under normal and abnormal conditions.

These guidelines should be applied to the facility to the extent required by the nature and quantities of materials involved. For example, results obtained in the hazard analysis indicating no off-site impact would remove the need for an off-site risk analysis to be conducted.

Reference should be made to the following documents to assist in these assessments:

- Hazardous Industry Planning Advisory Paper No. 4 "Risk Criteria for Land Use Safety Planning" (HIPAP 4) New South Wales Department of Urban Affairs and Planning;

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- Hazardous Industry Planning Advisory Paper No. 6 “Guidelines for Hazard Analysis” (HIPAP6), New South Wales Department of Urban Affairs and Planning;
- AS/NZS 4360:1999 Risk Management, Standards Australia and Standards New Zealand;
- AS/NZS 3931 (Int):1999 Risk Analysis of Technological Systems, Application Guide, Standards Australia and Standards New Zealand.

7.1.1 Hazard Identification

A hazard identification exercise should be conducted to identify the nature and scale of all hazards at the facility. All possible incidents should be identified, including:

- failure of pumps, pipework, storage tanks, process and reaction vessels;
- the potential for fire (including the generation of toxic combustion products), explosion and toxic release;
- operational errors resulting in the mixing of incompatible chemicals; and
- the potential for uncontrolled or runaway reactions.

The hazard identification process should consider the impact on the facility of any natural events such as cyclones, earth tremor, local flooding or bushfire. It should also identify the potential for fires or explosions at neighbouring facilities to cause damage to the proposed facility.

Any changes in operating or storage procedures that would reduce the possibility of the identified events occurring, or reduce the severity of the event if they do occur, should be identified and adopted where appropriate.

7.1.2 Hazard Analysis

A set of representative incidents from the hazard identification exercise should be selected for further analysis. This set should cover the entire range of possible incidents and should include worst case scenarios (for example, catastrophic failure of a storage vessel).

A preliminary analysis of the consequences of these incidents on people, property and the environment should be conducted to identify potential impacts. These impacts should include:

- fatality, injury and irritation to people;
- property damage and the potential for escalation;
- effects on the operation of this facility and neighbouring facilities; and
- potential effects on the environment of contaminant or firewater run-off entering sensitive habitats.

If any incident is found to have a damaging impact on neighbouring facilities, consultation with these facilities should be conducted to develop a common understanding of the issue and to develop ways to reducing or eliminating potential problems.

7.1.3 Risk Analysis

If the hazard analysis shows significant off-site impacts, a risk analysis should be performed. This will require an evaluation of the likelihood of each incident occurring in order to calculate the level of risk to surrounding areas due to the presence of the facility. Risk contours should be presented on a suitably scaled location map. The acceptability of the risk to surrounding land uses should be assessed by referring to Nationally adopted risk criteria for fatality, injury, and irritation presented in the New South Wales Department of Urban Affairs and Planning's *Hazardous Industry Planning Advisory Paper No. 4 "Risk Criteria for Land Use Safety Planning"* (HIPAP 4).

Any weather data used as part of this study should be obtained from a credible source, such as the Bureau of Meteorology or the Department of Environment (enquiries to Naturally Queensland Information Centre, 07 3227 8187). The data used should be obtained from a weather station as close as possible to the proposed site and take into consideration at least 5 years (or more if available) of meteorological recordings. The base data should be presented, together with any classification system or methodology used to convert this base data to an appropriate format for the studies undertaken. Any queries regarding the appropriateness of the weather data to be used should be directed to Ron Mellow, CHEM Unit, 07 3247 8444 in the preliminary stage of the study.

7.1.4 Transport Mode and Route Selection Study

A preliminary transport study based on the concepts of hazard and risk analysis should be conducted to identify the most appropriate route for transportation of hazardous materials to and from the site.

This study should identify the possible modes of transport (road, rail and sea) and the different routes available using each of these modes. A comparison of these modes and routes in terms of the potential impacts of an incident should be conducted, and on this basis the most appropriate mode and routes should be selected. If for logistical reasons only one mode of transport is practical, the reasons for this decision need to be presented.

In selecting the most appropriate route, consideration needs to be given to:

- the appropriateness of the infrastructure (e.g. suitability of roads for heavy vehicles due to road width, traffic conditions, etc);
- the potential consequences of an incident involving the hazardous materials; and
- the proximity of public areas including residential, sensitive land use sites (such as schools, hospitals, aged care facilities, etc) and facilities where large groups of people may be located (such as sporting venues, shopping centres etc).

Upon selection of the mode of transport and the route to be taken, details need to be provided of:

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- the total quantity to be transported on any one vehicle and the size of the container (e.g. a B-double carrying two tankers of 15 tonne each, total of 30 tonne);
- the exact route to be taken;
- the nature and location of any significant public areas along the route;
- the nature and location of any high hazard areas due to traffic or road conditions; and
- procedures to be adopted to reduce the risk along the route.

7.1.5 Safety Systems

Details of the design and operation of proposed safety systems should be presented, including:

- leak detection and minimisation systems;
- fire detection and suppression systems; and
- emergency shutdown systems and procedures.

7.1.6 Standards and Codes of Practice

All legislation, standards and codes of practice in relation to the storage, handling and transport of hazardous materials should be identified. A commitment by the applicant to comply should be provided together with a broad overview of design and/or operating principles that will need to be adopted to ensure this compliance.

7.2 Risk Prevention and Management

Provide an overview of safety management strategies and control measures to be used to minimise the risks of incident on site and to minimise the consequences of any incident under all operating conditions including :

- the handling of rework or recycled materials;
- the prevention and handling of fires on site;
- the segregation of incompatible products and ingredients;
- the containment of hazardous materials;
- the application of safety distances to the various activities on site to minimise the consequences of incidence;
- quality control of products and ingredients on site including the handling of non-conforming materials;
- maintenance of critical items of materials;
- the training of operatives;
- emergency procedures, including evacuation procedures where necessary; and
- emergency procedures in the event of a spillage from transport vehicles, including any proposed pipeline.

Provide an assessment of the likelihood of the proposal giving rise to significant risks of health impacts or unsafe conditions, particularly due to unplanned or accidental events (on-site or off-site, short term or long term).

7.3 Emergency Planning

Details of emergency planning procedures to be adopted should be provided.

The capabilities of the local emergency services should be assessed in Section 9.3 “**Social Impacts**” and any deficiencies in terms of resources or personnel should be taken into account in the preparation of an emergency plan.

A *Draft Emergency Response Plan* detailing safety management, risk management, hazard management and spill response plans should be included in the section “**Environmental Management Plans**”.

In preparing these emergency plans reference must be made to *Emergency Planning - Guidelines for Hazardous Industry*, available from the CHEM Unit.

7.4 Workplace Health and Safety Program

Details should be provided in relation to workplace health and safety issues, including design, construction and operational phases of the project.

Reference should be made to the relevant legislation and codes of practice covering the workplace health and safety of employees, visitors to the site and members of the public in the surrounding area. Additional measures taken beyond the scope of meeting legislative obligations should be described, for example health assessment or education programs.

The program should include the strategies for the construction and operational phases of the development and should include:

- Plant Noise;
- Airborne Workplace Contaminants;
- Operator Exposure; and
- Public Safety

Under public safety mosquito breeding prevention strategies should be addressed.

8. DESCRIPTION OF THE EXISTING ENVIRONMENT

The function of this section is to describe the environment which will or may be affected by the proposal.

8.1 Conservation Estate

Indicate if the land is, or is likely to become, part of the conservation estate or is subject to treaty. Discuss issues of proximity to the following areas (where relevant):

- national parks;
- conservation parks;
- wilderness areas;
- aquatic reserves;
- heritage/historic areas or items;

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- national estate listings;
- world heritage listings;
- areas of cultural significance; and
- scientific reserves.

8.2 Terrestrial, Air, Water Bodies and Watercourses

8.2.1 Fauna

The fauna occurring in the area should be described, noting the broad distribution patterns in relation to vegetation, topography and substrate. The description of the fauna present or likely to be present in the area should include:

- species diversity and abundance of animals, including amphibians, birds and reptiles (in addition, a literature review and limited site survey of local invertebrates should be included if this group is seen as significant);
- any rare, threatened or endangered species;
- habitat requirements and sensitivity to changes (including movement corridors and barriers to movement);
- use of the area by migratory birds; and
- fish species occurring in the waterways connected with the proposed site (movement requirements should be considered).

The report should indicate how well any potentially affected communities are represented and protected elsewhere.

Regional ecosystems and their conservation status under the *Vegetation Management Act 1999* should be described.

8.2.2 Flora

A vegetation map, at a suitable scale should be provided, with descriptions of the units mapped and, where appropriate, quantitative estimates of the population of significant species or plant communities. Sensitive or important vegetation types should be highlighted, including any bank vegetation associated with watercourses, and their value as habitat for fauna and conservation of specific rare floral and faunal assemblages or community types. The existence of rare, threatened or endangered species should be specifically addressed.

The description should contain a review of published information regarding the assessment of the significance of the vegetation to conservation, recreation, scientific, education and historical interests.

Regional ecosystems and their conservation status under the *Vegetation Management Act 1999* should be described.

The location of any horticultural crops in the vicinity of the site should be shown. The existence of important weed species should be discussed.

8.2.3 Air Quality and Emissions

Air quality aspects should be considered in view of the local air shed, with reference to both total contaminant load and emission concentrations. There should be a discussion of the results of baseline monitoring of total suspended particulates including a measure of the respirable fraction, and a description of the existing air environment having regard for gaseous and odorous compounds.

Sufficient data on local meteorology and ambient levels of pollutants should be gathered to provide a baseline for later studies or for the modeling of air quality impacts (if necessary). Parameters should include air temperature, wind speed, wind direction, variation in wind direction, mixing layer height and lapse rate.

8.2.4 Water

Rainfall data, water runoff and drainage patterns should be described.

Give details of the proposed site in relation to the catchment system and any waterways and drainage lines on or near the site.

8.2.4.1 Surface Water

A description should be given of the surface water quality and quantity in the region of the project with an outline of the significance of these waters to the river catchment system in which they occur. Details provided should include a description of the:

- existing surface drainage patterns;
- waterbodies (wetlands) on the site or likely to be impacted by development;
- flows in each stream;
- history of flooding including extent, levels and frequency; and
- present and potential water uses.

An assessment is required of existing water quality in surface waters likely to be affected by the proposed development, if any.

8.2.4.2 Groundwater

The report should review the quantity and significance of groundwater in the project area, together with groundwater use in neighbouring areas and the possible significance of the project to groundwater quality effects, depletion or recharge.

The review should include a survey of existing groundwater supply facilities (bores, wells, or excavations) which are within 2.5 kilometres of the boundaries of the site.

8.2.5 Noise

The EIS should contain a full description of the likely level of noise and management required.

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Indicate nearby land uses including agricultural uses and residences on a scaled map, with contours and weather patterns, in order to identify land uses that could be affected by the proposal.

List all noise sources and define areas of impact.

Verification of background sound pressure levels and noise surveys of ambient levels at night during cooler weather are required.

When preparing the noise study, predictions of sound pressure/sound power levels at the proposed site should be based on the sources of maximum noise that not only coincide with areas where employees may be exposed within buildings, but also persons exposed outside of any buildings at the plant and where occupational exposure to the noise is limited e.g., compressors, pumps, vents, turbines or generating sets located away from employee areas.

Any statements about existing background noise levels, sound power levels of equipment to be installed, building sound transmission loss should be substantiated. Any predictions on operational noise should be based on relevant data from similar industries or equivalent equipment. Commitments should be made to ensuring that environmental noise from the whole plant is managed to ensure that noise does not exceed a nominated relevant sound pressure level at a reference distance or that tonal or impulsive characteristics will be prevented.

Any assumptions about sound transmission losses should take into account the design and quantity of openings facing towards neighbouring residences (if any) i.e., will the buildings require substantial ventilation. Appropriate commitments by the Proponent to apply acoustic treatment measures to buildings or noise sources should be provided.

8.2.6 Visual amenity

The report should describe the existing visual amenity of the area, addressing the value of the area from both the local and regional landscape perspective.

8.3 Social Environment

8.3.1 Demography of the Locality and Region

This subsection should include written and numerical data in relation to the existing population in the locality and region. The following population characteristics should be examined:

- size;
- age structure;
- gender composition;
- educational status;
- length of residency in the locality and regions; and
- labour force characteristics.

8.3.2 Workforce Accommodation

This subsection should describe the existing workforce accommodation available in the region. Information regarding the threshold capacity and the current utilisation of these facilities should be provided.

8.3.3 Health Facilities

This subsection should describe the existing health facilities available in the region. Information regarding the threshold capacity and the current utilisation of these facilities should be provided.

8.3.4 Education Facilities

This subsection should describe the existing educational facilities available in the region. Information regarding the threshold capacity and the current utilisation of these facilities should be provided.

8.3.5 Police Facilities

This subsection should describe the existing police facilities available in the region. Information regarding the threshold capacity and the current utilisation of these facilities should be provided.

8.3.6 Emergency Services Facilities

This subsection should describe the existing emergency services available in the region. Information regarding the threshold capacity and the current utilisation of these facilities should be provided.

8.3.7 Community Facilities

This subsection should describe the existing community facilities available in the region. Information regarding the threshold capacity and the current utilisation of these facilities should be provided.

8.3.8 Recreation Facilities

This subsection should describe the existing recreational facilities available in the region. Information regarding the threshold capacity and the current utilisation of these facilities should be provided.

8.4 Economic Environment

8.4.1 Local and Regional Economic Bases

The purpose of this subsection is to provide information on the economic bases of the region, including the agricultural, industrial, mining, retail and service sectors. The nature of the economy, that is growth oriented or decline oriented, should be discussed.

Development approvals given by the State or Local Government in the locality and in the region should also be referenced.

8.4.2 State Economic Development Strategy

This subsection should discuss the relationship, compatibility or conflict between the proposal and the State Economic Development Strategy.

8.4.3 Local Economic Development Strategy

This subsection should discuss the relationship, compatibility or conflict between the proposal and the Regional Economic Development Strategy for the Bendemere Shire.

8.5 Land Characteristics and Land Use

The purpose of this section is to enable an assessment of the capacity of the land to accommodate the development proposal, identify risk management strategies and the compatibility of the proposed development with the State and Local Government's forward planning strategies.

8.5.1 Topography, Geology, Geomorphology, Soils and Catchments

A description (or map) should be provided showing the project in perspective to the catchment in which it lies. Areas of environmental significance should be identified and discussed such as wetlands, lakes, rivers, plateaus, desert areas, karst, and sites of special geomorphologic significance. Details should be provided of the location of any structures and areas to be disturbed by the project.

The IAS should provide a description of the geology, seismic activity and ground stability of the site with particular reference to those physical and chemical properties of surface and sub-surface materials which may influence occupational health, rehabilitation programs, or the quality of water leaving the site. Quality and quantity of any natural construction materials on the site should be recorded.

A soils map (at a suitable scale) should be provided covering the surface area of the site(s) under consideration to assist in identifying the best location for the facility and its infrastructure and the best land management needs of the surrounding land. The physical and chemical properties of the soil types that may render a soil either useful or difficult in respect to a rehabilitation program should be discussed, including assessment of potential for erosion. An appraisal should be made of the depth and quantities of useable soil for the different soil types on the site. An assessment of the agricultural potential of the site should be carried out and where good quality agricultural land is involved, the soils information should be compiled in accordance with Section 5 of the *Guidelines for the Identification of Good Quality Agricultural Land* (DPI and DHLG 1992). When identifying soil types and agricultural potential references should also be made to the *Roma District Land Management Field Manual* (ed S.E. Macnish, 1987). If mapping reveals that Good Quality Agricultural Land may be impacted by the project, detailed assessment should be undertaken as set out in Section 6 of the *Guidelines for the Identification of Good Quality Agricultural Land*.

Soil testing should include permeability and other engineering properties which help determine possible impacts on groundwater and indicate site limitations for foundations and earthworks such as retention ponds and waste management structures.

8.5.2 Planning Scheme Provisions for the Development Site and Immediate Locality

This subsection should describe the compatibility of the development with the Local Government's planning scheme.

8.5.3 Land Uses on the Site and Immediate Locality

A map showing existing land use should be provided covering the area affected by the proposal.

A land capability map setting out land use potential according to the Department of Natural Resources land classification system or other suitable system should be included. The location of other features such as:

- existing dwellings;
- zoning of land;
- local government planning controls and local laws;
- owners of all tenures - Crown and freehold land, reserves, roads and road reserves, stock routes and the like, over and around the proposed project should be shown; and
- infrastructure services such as water and sewerage, pipelines, powerlines, telephone lines, and other similar transport corridors(e.g. road, rail and air transport) should be described or mapped.

8.5.4 Regional Planning Strategy

This subsection should summarise any regional planning strategies in place or intended in the near future. Reference should be made to Strategic Plans for the individual local government areas in the region which provide the planning criteria.

8.6 Cultural Heritage

The purpose of this section is to identify matters of cultural importance.

8.6.1 Archaeological and Historic Values

Literature relating to the site should be reviewed, and special purpose surveys conducted if necessary. The National Native Title Tribunal has been contacted to establish current Indigenous expressions of interest in land related to the proposed project. Consultation with the Mandandanji people and the Iman people and their recognised representative bodies the Qld South and Queensland Central Bodies should be undertaken to ensure traditional owners assess the need for such studies. Any specialist surveys must be undertaken by a qualified professional, in association with the

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traditional owners. The professional person must possess a permit to undertake the survey issued in accordance with the *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987*. Applications for permits are available from the Department of Environment.

Commissioned surveys must map and record in detail all prehistoric sites located. The report should include an assessment of the significance of any sites located on or near the site.

Findings from any surveys must be presented in a format that is acceptable to the relevant Aboriginal people, whilst still meeting the information requirements of the proponent.

8.6.2 Aboriginal Cultural Values

This subsection should discuss any places of cultural significance on, or near the proposed facility site.

As a matter of State Government policy, Aboriginal communities must be consulted, to determine if there are any places of cultural significance on, or near the site. The Queensland Department of Families, Youth and Community Care should also be contacted, and advice sought on appropriate methods for consulting with indigenous people.

8.6.3 Non-Aboriginal Cultural Values

If the area covered by the proposed site includes known non-Aboriginal historic sites, proposals should be developed, in consultation with the Department of Environment, the Queensland Museum and local historical or museum societies for their protection.

9. ENVIRONMENTAL IMPACTS

9.1 Introduction

The previous sections have identified the nature and scope of the project and the existing environment of the area in which it is proposed to site the project. The objectives of this section are to examine the likely impacts of the proposal, including the impacts on adjacent/offsite areas, and discuss available techniques to control and manage these impacts. Alternative strategies for managing impacts should be discussed under the appropriate sub-headings, as should issue-related risk assessments (while major risk assessment issues should be discussed in the subsection devoted to this topic).

9.2 Terrestrial, Air, Water Bodies and Watercourses

9.2.1 Fauna

This subsection should discuss all foreseen direct and indirect effects on fauna. Terrestrial and aquatic environments should be covered. The existence of rare and endangered species should be taken into account.

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Alterations to the local surface and groundwater environment could potentially have adverse effects on fauna, and these should be investigated and discussed. Effects may include direct effects such as the destruction or contamination of habitat, or the inhibition of normal movement, propagation or feeding patterns, to indirect effects such as the disruption of food chains. Measures to mitigate these effects should be described.

The potential impacts on fauna should be described with specific reference to any impact on sensitive communities.

Indicate if the proposal is likely to affect potentially significant systems, either directly or indirectly. Strategies for protecting rare, threatened or endangered species should be described, and any obligations imposed by State or Commonwealth endangered species legislation or policy should be discussed. Indicate if the proposal is likely to affect potentially significant systems, either directly or indirectly.

Effects on vertebrates and invertebrates should always be considered if sensitive or rare species may be affected. The discussion of vertebrates should focus on species, while invertebrates may be discussed at the genus or family level, provided there are no rare or endangered species involved.

9.2.2 Flora

The discussion in this subsection should cover all foreseen direct and indirect effects on flora. Terrestrial and aquatic environments should be covered. The existence of rare and endangered species should be taken into account.

The potential impacts on flora should be described with specific reference to any impact on sensitive vegetation communities.

Indicate if the proposal is likely to affect potentially significant systems, either directly or indirectly. Strategies for protecting rare, threatened or endangered species should be described, and any obligations imposed by State or Commonwealth endangered species legislation or policy should be discussed. Indicate if the proposal is likely to affect potentially significant systems, either directly or indirectly.

Weed control strategies should be addressed.

9.2.3 Air Quality and Emissions

One of the purposes of the information required in this Term of Reference is to enable the Advisory Agencies and the Responsible Authority to determine the adequacy of provisions in an Integrated Environmental Management System, Environmental Management Plans and conditions attaching to a decision regarding the proposal. Accordingly, the modelling techniques utilised will supply data to enable this determination.

Information should be submitted on the projected generation of any gaseous emissions, steam, dust, fumes, odours or fine particulates. This information should include, where appropriate, the predicted one hour, 24 hour, monthly and annual average ground level concentrations in adjacent areas as well as on the area for which application has been made. Information should also

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include any physical state of gaseous emissions which may influence dispersion behaviour, for example cold ammonia gas. All measures and techniques proposed to eliminate, minimise or control such emissions should be discussed. These predictions should be made for both normal and expected maximum emission conditions and the worst case meteorological conditions should be identified and modelled where necessary.

Specific predictions of ground level concentrations of pollutants at the boundary of the project should be made. Ground level predictions should also be made at any residential and agricultural developments (believed to be sensitive to the effects of predicted emissions) within a ten kilometre radius of the emission source. These predictions should provide a frequency distribution of ambient concentrations over a full year. The techniques used to obtain the predictions should be referenced, and key assumptions and data sets explained.

In predicting effects on the air environment, consideration should be given to both the construction and operation stages of the development.

A complete list of air contaminants proposed to be released to the atmosphere should be included. Any impact potential should be addressed in the light of relevant standards (emission and ground level concentrations) and any relevant strategies and agreements (such as the National Strategy for Greenhouse Gas Emissions).

The consequences of higher than normal emissions during construction, operation and decommissioning of the facility, should be assessed. Both the short term and long term duration should be considered, with particular reference to the areas environmental resilience.

The assimilative capacity of the environment to absorb emissions should be assessed

Any possible risks to the community health, safety, welfare or quality of life should be considered and assessed. Assess the effects of odour, dust, exposure to stack emissions, potential exposure to flammable, explosive, toxic, radioactive, carcinogenic or mutagenic substances, or substances suspected of being carcinogenic or mutagenic during usage, storage, disposal and transportation. Discuss both accidental release or cumulative impacts.

Information should be provided on the predicted level of dust emanating from transport systems (road, rail, port) during transport of any materials or from loading and unloading facilities. Such information should include the type of covering (eg tarpaulins, containers) to be used to minimise dust emanations during transportation, together with practices to minimise such emanations during loading and unloading.

Air Dispersion Modelling

With specific reference to air dispersion modelling the following matters must be taken into account:

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- Information regarding plant design and operational characteristics from the plant designers, and estimates of emission rates or performance standards should be provided
- Emissions should be estimated for input to the dispersion models
- Meteorological data should be generated for the site. A model type to generate data to enable a meaningful assessment should be used e.g., The Air Pollution Model (TAPM) or similar, the use of which would enable the formulation of provisions for an Environmental Management Plan and conditions of an approval could be formulated
- A model type to generate data to enable a meaningful prediction should be used e.g., AUSPLUME (v.5) or similar, the use of which would enable the formulation of provisions for an Environmental Management Plan and conditions of an approval could be formulated
- The predicted ground level concentrations should be assessed against relevant nominated criteria.

A full description of the air dispersion models used should be included, or a reference provided, and a discussion of the adequacy of the model to handle dispersion influences likely to be experienced at the proposed site. The air quality modelling results should be discussed in light of the limitations and accuracy of the applied model.

Validation of the various dispersion models used should be undertaken by comparing predicted ground level concentrations to available ambient monitoring data, and if appropriate, validation against site specific meteorological measurements.

Odour

Discuss in detail, potential for odour impacts off site from stacks and fugitive emissions. Any odourous emissions i.e., volatile organic compounds, ammonia compounds, etc should be identified and quantified. The effectiveness of the pollution control technology in minimising odour emissions should be addressed, and the overall odour nuisance potential should be assessed.

Dust Suppression

Fully outline dust suppression initiatives and decontamination and management of any scrubbing liquids produced. Discuss and recommend dust suppression strategies and monitoring of dust impacts.

Emissions During Plant Upsets

The projected levels of emissions of dust, fumes and odours should include emissions during normal and upset conditions (which might include events during the commissioning phase). Emissions during upset conditions should be described by indicating the type of event/s and associated mass emission

rate of pollutants and frequency and duration of the event. The impacts upon air quality as a result of plant upsets should be assessed.

9.2.4 Water

All potential impacts likely to affect the hydrology or quality of groundwater or surface water resources should be outlined including:

identification of possible sources of water pollution or other changes in water quality including soil erosion, siltation, accidental spills, waste disposal and likely chemical composition of any leachate from introduced fill on the site.

Water management controls should be described, addressing surface and groundwater:

- quality;
- quantity;
- drainage patterns; and
- sediment movements.

Monitoring programs should be described which should assess the effectiveness of management strategies for protecting water quality during the construction, operation and decommissioning of the plant.

Key water management strategy objectives include:

- minimisation of contamination of local watercourses by sediment or nutrient rich wastes;
- protection of the integrity of important local aquifers; and
- maintenance of sufficient quantity and quality of surface waters to ensure the protection of existing beneficial uses, such as irrigation and domestic consumption, of those waters.

These issues could be presented under the following sub-headings:

9.2.4.1 Surface Water

The impacts which any discharges of liquids are likely to have upon the flow (or quantity) and the quality of surface waters should be discussed including identification of the effects the following items will have on the hydrology of the site:

- drainage works;
- placement of fill;
- clearing or any other alterations to existing topography and landform; and
- runoff from hard surfaces.

Quality characteristics discussed should be those appropriate to the water uses, and the discussion should refer to the need or otherwise for any discharge to be covered by a license under the *Environmental Protection Act 1994 (Queensland)*. Chemical and physical properties of any wastewater (including concentrations of constituents) at the point of entering natural

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surface waters should be discussed along with toxicity of effluent constituents to flora and fauna. The *Environment Protection (Water) Policy* should be used as a reference for evaluating the effects of various levels of contamination.

In relation to water supply and usage and wastewater disposal, the report should discuss anticipated flows of water to, within and from the site under critical conditions, including the consequences of failure (under such conditions) of proposed pollution-control works. Where dams, weirs or ponds are proposed, the report should investigate the effects of predictable climatic extremes (droughts, floods) upon:

- the structural integrity of the containing walls;
- the quality of the contained water; and
- flows and quality of water discharged.

If levee banks or stream diversionary constructions are proposed, the effects on neighbouring landholders should be considered, and any works requiring permits or licensing in accordance with the *Water Resources Act 1989 (Queensland)* and the *Water Act 2000* are to be identified.

9.2.4.2 Groundwater

The IAS should include an assessment of the impact of the project as a whole on local groundwater resources. Activities which could affect the availability and quality of ground water resources within 2.5 kilometres of the boundaries of the site should be discussed.

The impact assessment study should also define the extent of the area within which groundwater resources are likely to be affected by the proposed facility operations, and management options available to monitor and mitigate these effects.

In relation to studies conducted to support planning for the proposal, methods used and all information obtained should be reported. The need or otherwise for licensing of any groundwater bores under the *Water Resources Act 1989 (Queensland)* should be discussed.

9.2.5 Noise Effects

Information should be submitted on the projected generation of noise relevant to any place of work or residence, and proposals to minimise or eliminate these effects including details of any screening, lining, enclosing or bunding necessary. Timing schedules for noisy operations should be discussed where necessary.

Off-site transport noise and vibration factors due to road and rail use should be accounted for and described. Reference should be made to barriers and speed controls, the scheduling of transport movements to non-critical times (ie between 6.00 am and 10.00 pm) and any other strategies to minimise noise impacts.

Impacts should be assessed in relation to the requirements of the *Environmental Protection (Noise) Policy*.

9.2.6 Solid Waste

This subsection should discuss the waste management strategies for the plant. The discussion should include the expected demand on existing local landfills in terms of the direct demand for domestic waste disposal from the plant site and the indirect demand caused by the population increase in the township resulting from the presence of plant construction and operation crews. Where any on-site storage of solid waste is considered reference should be made to the nature and ability of soils and topography to cope with such storage. Reference should also be made to overland flow and potential for nutrient leaching.

9.2.7 Liquid Waste

This subsection should discuss the wastewater minimisation, treatment (including recycling) and disposal of wastewater generated on site (e.g., process wastewater and sewage).

9.2.8 Land Contamination

Means of managing contamination of land (within the meaning of the *Contaminated Land Act 1991 (Queensland)*) should be addressed. Methods proposed for preventing, recording, containing and remediating any contaminated land should be outlined. Intentions should be stated, where possible, concerning the classification (in terms of the Queensland Contaminated Land Register) of land contamination on the site after plant decommissioning.

In some cases an initial survey of the site may be necessary to determine background mineralisation levels (if the site is undisturbed) or pre-existing contamination levels (if the site has been previously disturbed). The results of such surveys should be summarised.

9.2.9 Erosion Control

The report should include an assessment of likely erosion effects, especially those resulting from the removal of vegetation, both on-site and off-site for all disturbed areas such as: the facility site, including associated buildings, access roads; waste disposal areas and dam or pond banks.

Methods proposed to prevent or control erosion should be specified and should be developed with regard to preventing soil loss in order to maintain land capability, and preventing significant degradation of local watercourses by suspended solids. Slopes and batter angles should be clearly shown in plans, and details provided on runoff management arrangements.

Plans should provide sufficient detail to determine whether the site can be developed in the manner suggested whilst incorporating adequate erosion control. Design information should consider measures advised in:

- Pollution Control Manual for Urban Stormwater;
- Queensland Urban Drainage Manual; and
- Soil Erosion and Sediment Control - Engineering Guidelines for Queensland, IEAust, June 1996.

9.2.10 Fire Control

Measures to control fire in the plant and bushfire should be presented where relevant.

A description of all measures to be undertaken to minimise fire escape from or entry to the site should be provided. The fire hazard posed by vegetation should be briefly discussed.

9.2.11 Visual Impact of the Proposal

The visual impact of the project as it relates to the surrounding landscape should be discussed.

Information should be supplied on the techniques proposed to reduce any visual impact. It should include the preparation of landscape specifications to reduce the short and long-term visual impacts of the project.

Special consideration should be given to public roads or thoroughfares or places of residence or work. If the site is in an area of high landscape value, this may create a need for special treatments of key areas. Details of the design and colour of any buildings or fixed plant and all proposed screenings either vegetative or material should be set out. The obstruction of sunlight due to the construction of buildings or alteration of landforms should be considered, as well as major illumination or reflection impacts on adjacent properties.

9.2.12 Land Use Amenity Issues

The potential impact on the amenity of adjacent areas used for cropping, grazing, forestry, recreation, industry, education, aesthetics, or scientific or residential purposes should be discussed. If the development adjoins Good Quality Agricultural Land then an assessment of the potential for land use conflict is required. Investigations should follow the procedures outlined in the *Planning Guidelines: Separating Agricultural Land and Residential Land Uses*. Allowances should be made for incorporating buffers to separate the plant facility from surrounding land use, particularly if surrounding land is used for agricultural purposes. The implications of the proposed project for future developments in the local area including constraints on surrounding land uses should be described. The potential impact on the future use of the site should also be considered.

9.2.13 Mineral, Coal & Petroleum Resources

The EIS must include an assessment of the impact of the project on any known mineral, coal and petroleum resources or development infrastructure and outline strategies for minimising any impacts identified.

9.3 Social Impacts

This section should discuss the impacts of the proposal on the social infrastructure of the region under the following subsections:

9.3.1 Demography

This subsection should discuss the potential impacts on the demographics of the region as a result of the proposed project. An assessment should be made of the potential changes to the local population, based on number, age and gender, as a result of the construction and operational phases of the project.

9.3.2 Workforce Accommodation

This subsection should discuss the impact of the construction and operational phase workforces on the accommodation in the region. An assessment should be made of the additional demand for accommodation, of various types, which may arise in the district as a result of the construction and operation phases of the project.

9.3.3 Health Facilities

This subsection should discuss the potential usage by the workforce and their families of the health facilities in the region. The discussion should include the capacity of the facilities to accommodate this usage and identify any requirements for an increase in personnel and/or infrastructure.

9.3.4 Education Facilities

This subsection should discuss the potential usage by the workforce and their families of the educational facilities in the region. The discussion should include the capacity of the facilities to accommodate this usage and identify any requirements for an increase in personnel and/or infrastructure.

A clear indication should be provided of the anticipated location/s of the accommodation for temporary and permanent workforce likely to be generated by the project.

9.3.5 Police Facilities

This subsection should discuss the potential impact of the workforce and their families on the police facilities in the region. The discussion should include the capacity of the facilities to accommodate this usage and identify any requirements for an increase in personnel and/or infrastructure.

9.3.6 Emergency Services Facilities

This subsection should discuss the potential impact of the project on the emergency services facilities in the region. The discussion should include the capacity of the facilities to accommodate this usage and identify any requirements for an increase in personnel and/or infrastructure.

9.3.7 Community Facilities

This subsection should discuss the potential usage by the workforce and their families of the community facilities in the region. The discussion should include the capacity of the facilities to accommodate this usage and identify any requirements for an increase in personnel and/or infrastructure.

9.3.8 Recreational Facilities

This subsection should discuss the potential usage by the workforce and their families of the recreational facilities in the region. The discussion should include the capacity of the facilities to accommodate this usage.

9.4 Economic Impacts

Economic analysis should be presented from National, State, regional and local perspectives as appropriate to the scale of the proposal.

The general economic benefits from the proposed facility should be described. Attention should be directed to the long and short term effects of the proposal on:

- the land use of the surrounding area and existing industries;
- regional income;
- regional employment; and
- the State Economy.

Information should be provided on the extent to which local and Australian services and goods will be utilised and the industry opportunities which may arise as a result of proceeding with the development proposal.

Confidential information should not be presented.

9.5 Cultural Heritage Impacts

This section should provide information on the direct and indirect impacts of the development proposal on Aboriginal and European cultural heritage matters and values. Information should include separation distance between plant activities and identified cultural heritage features, management of areas where special values attach to a site rather than to visible artefacts or remains, and recording and reporting of artefacts accidentally uncovered.

9.5.1 Aboriginal Heritage

The IAS should identify strategies for the conservation and/or management of any identified site of Aboriginal cultural significance. Issues which should be addressed are the restriction of access to land, disturbance of sacred sites, change of lifestyles, effect on cultural values, damage to anthropological or archaeological sites or cultural items and the result of increased visitation to areas likely to contain archaeological sites, cultural items or artefacts. Consultation with local Aboriginal communities and landholders as well as consultation with the Department of Environment, must take place before such strategies are put in place.

Management plans must be put in place to protect, in an appropriate way, any such sites. Such plans need to be developed in consultation with the local Aboriginal community.

9.5.2 Non-Aboriginal Heritage Impacts

If any non-Aboriginal historic sites are identified on the site, proposals should be developed, in consultation with the Department of Environment, the Queensland Museum and local historical societies or museums for their protection.

9.6 Infrastructure and Transportation

This section should discuss the effect of traffic generated by various stages of the project. In particular the effect on the existing State and local government road network should be examined. This should include the extent and capacity of the existing transport network.

The proposed means of mitigating potentially adverse effects should be stated.

In particular the following matters should be addressed:

- the impact of transport of materials and workers to and from the site during constructions and operation;
- the impact of an increase in local population in the area;
- hazards associated with increased transport movements. The principal issues are likely to be dust and noise, however potential road safety impacts and hazards posed to pedestrian humans and animals should also be considered where appropriate;
- transport of plant materials (such as weed seeds or disease) to and from the site during construction and operation; and
- impact of increased traffic volume on declared roads and on rail systems. Describe the type of vehicles which will be used, their length, gross mass, and whether the vehicles have or have not a road friendly axle.

Impacts should be broken down to incorporate both infrastructure, and environment during construction and operational stages and hazards should be broken down into types of materials and the level of risk.

Proposed program and funding levels for the upgrading and construction of roads and / or rail required by the project should be covered in Section 11.2 “**Development Contributions**”.

9.7 Greenhouse Gas and Adaptation to Climate Change

This Term of Reference should provide information on the impacts of the proposal and identify the results of analyses utilised to identify the impacts. Information should describe the impacts, whether these impacts can be managed and referenced to the relevant Environmental Management Plan within the Integrated Environmental Management System.

This information should describe:

- the intended measures to avoid, minimise and/or offset greenhouse emissions, including, if appropriate, sink enhancement activities

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- the results of an environmental analysis of comparable technologies, processes and equipment to allow assessment of the degree to which the selected options minimise emissions and other environmental harms, with a view to achieving best practice environmental management
- greenhouse gas generation assessment which should include accounting of the electricity generation related to the proposal (if any).

The above assessment should be undertaken with due consideration of relevant protocols, agreements and strategies including "The National Greenhouse Strategy", "National Greenhouse Gas Inventory", and "The Framework Convention on Climate Change". These references are to be identified in section 15 APPENDICES of the EIS.

10. STAKEHOLDER CONSULTATION PLAN

In this section the consultation program (with timetable) should be presented in summarised form, so that the community will know when comment can be usefully accepted, and how it will be evaluated. An appropriate public participation program is essential to the full conduct of the impact assessment. In particular, it is needed as part of the methodological approach to identify and mitigate social impacts that may arise from the proposal.

Readers should also be informed as to:

- participation or consultation activities undertaken in the project formulation (e.g. include a table summarising who was consulted, the issues raised, and measures to address the issues raised - this may be included as an appendix);
- how submissions on the IAS will be addressed and taken into account in the decision-making process; and
- the mechanism by which matters will be addressed if major new issues are raised or information gaps identified. For example, whether a supplement to the IAS would be published, as well as a final IAS.

Consultation objectives should include:

- informing the different interest groups about the project proposal;
- seeking a preliminary understanding of interest group concerns about the project;
- explaining the impact assessment research methodology and how the group's input will influence the decision making process; and
- informing interest groups of findings.

Consultation principles to be followed are:

- discussion should seek to facilitate interest group input into the impact assessment research rather than disseminate information;
- information should be presented in a culturally appropriate manner;
- interest groups should be given sufficient time to respond to requests from the consultants;

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- meetings should be structured so as not to raise the expectations of particular interest groups in relation to the project during construction and operation.

11. DEVELOPMENT APPROVALS AND CONTRIBUTIONS

This section should explain the legislative and policy framework, both existing and proposed, controlling the life of the project.

11.1 COMMONWEALTH GOVERNMENT

Approvals Licences, Permits, Codes, Management Strategies

Environment Protection & Biodiversity Conservation Act 1999

Approval is required if any aspects of the proposal are a controlled action pursuant to this Act.

Foreign Investment Review Board approval is required for off shore investment of greater than \$5M.

National Strategy for Ecologically Sustainable Development.

11.2 STATE GOVERNMENT

11.2.1 Environmental Protection Agency

Approvals Licences, Permits, Codes, Management Strategies

Environment Protection Act 1994

Environmentally Relevant Activities (ERAs) are likely to include:

- ERA 6c Chemical processing
- ERA 7b Chemical storage
- ERA 14b Sewage treatment
- ERA 17 Fuel burning

Integrated Environmental Management System

An Integrated Management System is to be submitted with the EIS. It may incorporate an Environmental Management Plan and should describe all monitoring and reporting programs and implementation responsibilities.

Environmental Management Plan Guidelines

Environmental Protection (Waste Management) Policy 2000

11.2.2 Department of Natural Resources & Mines

Approvals Licences, Permits, Codes, Management Strategies

Water Resources Act 1989; Water Act 2000

Licence for Works and water allocation approved in 1998.

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Permit to Occupy: Permit to occupy required if an infrastructure item e.g. water, gas, sewage pipeline is within a road reserve managed by local government.

Vegetation Management Act 1999

Vegetation clearing permit required for freehold land.

Land Act 1994

Tree clearing permit required for State land.

Petroleum Act 1923

Gas Pipeline Licence.

Electricity Act 1994

Electricity connection.

Gas Pipeline on Lot 208

Santos Ltd advised the then Department of Economic Development and Trade Project Manager that the pipeline easement on Lot 208 is used for the Santos operated gas pipeline from the North Gathering System to the Pickanjinnee 4 (on Lot 208) and Stakeyard 3 wells and is still in use. Based on current and potential future operations Santos cannot remove the pipeline from service nor can they approve construction work over the easement.

11.2.3 Queensland Transport and Department of Main Roads
Approvals Licences, Permits, Codes, Management Strategies

Transport Infrastructure Act 1994

Section 31. Access to State Controlled Road and construction works.

Carriage of Dangerous Goods by Road Act 1984

License to carry dangerous goods.

Permit to Occupy: Permit to occupy required if water, sewage, gas corridors are within the Warrego Highway road reserve.

Development Contributions

The Department of Main Roads requires written provision in the EIS that:

‘Any capital works or additional maintenance necessitated on State Controlled Roads by the project, and not provided for in the Roads Implementation Program, will be the responsibility of the Proponent.’

11.2.4 Department of Emergency Services
Approvals Licences, Permits, Codes, Management Strategies

Emergency Response Plan

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- Policy re Hazmat Boxes;
- Emergency Services Manifest Form; and
- Site Plan identifying location of hazardous substances.

Dangerous Goods Safety Management Act 2001

September 2001 - anticipated commencement by proclamation of general provisions

March 2002 - anticipated commencement by proclamation of specific provisions

Specific provisions relating to new major hazard facilities will apply.

11.2.5 Department of Employment & Training

Approvals Licences, Permits, Codes, Management Strategies

Workplace Health and Safety Act 1995; Regulations; Compliance and Advisory Standards

Design and registration of equipment and plant performance criteria for the safety of workers and visitors.

11.3 LOCAL GOVERNMENT

11.3.1 Bendemere Shire Council

Approvals Licences, Permits, Codes, Management Strategies

Integrated Planning Act 1997

An application for development approval is required to be lodged and accompanied by the EIS approved by the Coordinator General and a copy the Coordinator General's Report.

Building Act 1975

Building Permit.

Building (Flammable and Combustible Liquids) Regulations.

Local Government Act 1993

Water and drainage connections.

Extraordinary traffic movements will need permit from the Area within which the extraordinary traffic will travel.

11.4 OTHER AGENCIES

Queensland Rail: Advice on freight rates.

Port of Brisbane Corporation: If product is transported in to or out of the Port of Brisbane.

12. ENVIRONMENTAL MANAGEMENT PLANS

Integrated Environmental Management System

An Integrated Management System is to be submitted with the EIS. It may incorporate Environmental Management Plans and should describe all monitoring and reporting programs and implementation responsibilities.

This section should include copies of the various Draft Management Plans associated with the development including:

- Environmental Management Plan; and
- Emergency Response Plan.

12.1 Draft Environmental Management Plan

A Draft Environmental Management Plan (EM Plan) should be consistent with detailed guidelines provided by the Environmental Protection Agency.

The EM Plan is intended to carry forward Impact Assessment recommendations and to establish linkages to licenses. The aim is to ensure that performance criteria are nominated as early in the design phase as possible so that engineering design is directed by an environmental management outcome rather than attempting to accommodate performance criteria.

The EM Plan should:

- provide evidence of practical and achievable plans for the management of the project;
- ensure that environmental requirements are complied with, by producing an integrated planning framework for comprehensive monitoring and control of construction and operational impacts (specific commitments on strategies and design criteria to be employed should be given);
- provide local, State and Commonwealth authorities and the Proponent with a framework to confirm compliance with their policies and requirements;
- provide the community with evidence of the management of the project in an environmentally acceptable manner; and
- be periodically updated to reflect knowledge gained during the course of operations. Changes to the management plan should be implemented in consultation with the relevant authorities.

In general the EM Plan should contain a detailed list of commitments by the Proponent in respect of environmental protection. Essential components to be included are:

- establishment of agreed performance criteria and objectives in relation to environmental and social impacts;
- detailed prevention, minimisation and mitigation measures for environmental impacts at specific sites;
- details of the proposed monitoring of the effectiveness of remedial measures against the agreed performance criteria in consultation with relevant government agencies and the community;

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- details of the funding and implementation responsibilities for environmental management;
- timing of environmental management initiatives; and
- reporting requirements and auditing responsibilities for meeting environmental performance objectives.

The structure of the EM Plan is to be as follows:

Element	Aspect of construction or operation.
Policy	The operational policy that applies to the element.
Performance Criteria	The performance criteria for each element of the operation.
Strategy	The methods that will be implemented to achieve the performance requirements.
Monitoring	The monitoring requirements which will measure actual performance.
Reporting	Format, timing and responsibility for reporting and auditing of monitoring results.
Corrective Action	The action(s) to be implemented in case a performance criteria is not reached and the person(s) responsible for action.

Specific elements of the EMP should cover aspects of construction or operation that may have an adverse impact on the environment. An EMP should detail at least any:

- habitat enhancement projects or rehabilitation measures
- maintenance schedules
- erosion and sediment management strategies
- pollution controls and waste management methods
- a management and administration plan outlining strategies and procedures in the event of an emergency.

Monitoring Programs

Performance requirements should be specified quantitatively including performance indicators for each aspect to be measured e.g., indicators for air or water quality, and the stipulated target level for each indicator. The timing and frequency of monitoring should also be provided. Monitoring programs should:

- ensure safeguards are being effectively applied
- identify any differences between predicted and actual impacts and
- identify the party responsible for undertaking corrective actions and the actions taken to address problems.

The reporting program should detail:

- steps to be taken to correct detrimental effects identified by monitoring; and

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- procedures for reporting on monitoring programs and proposed recipients of reports.

12.2 Draft Emergency Response Plan

Details of the emergency planning procedures to be adopted, and an outline of the emergency plans and procedures developed to date should be included. This emergency plan should identify neighbouring areas likely to be affected in the event of an emergency. Procedures should be developed to ensure protection of these areas. It should also outline the procedures to be followed in the event of an incident involving the loss of hazardous materials during transport either within or outside the plant.

Consultation with neighbouring property owners should result in the development of notification systems that will alert neighbouring sites of an incident at the QFAL facility that is likely to affect these neighbouring sites. This consultation should also aim to ensure a similar system is in operation at neighbouring properties to alert QFAL of incidents, such as bushfires, on their properties.

The Draft Emergency Response Plan should meet the requirements of an off-site plan as defined in the *Fire Service Act 1990, Section 97(4)*.

The *National Code of Practice for Control of Major Hazard Facilities* requires an off-site plan to be drawn up by any plant which comes under the classification of a major hazard facility.

A facility is defined as a Major Hazard Facility where the amount of any material present, or likely to be present, exceeds the corresponding threshold quantity. For ammonium nitrate fertilisers (UN Numbers 2067, 2068 and 2070) this threshold quantity is 5,000 tonnes. For ammonium nitrate with no more than 0.2 percent combustible substances (UN Number 1942) the threshold is 2,500 tonnes. For anhydrous ammonia (UN Number 1005) this threshold is 200 tonnes.

The document *Emergency Plans: Guidelines for Major Hazard Facilities* published by the Chemical Hazards and Emergency Management (CHEM) Unit and Queensland Fire and Rescue Authority in October 1996 (copies available from the CHEM Unit) should be consulted when preparing the Draft Emergency Response Plan.

The *Fire Service Act 1990, Section 97(4)* defines an off-site plan as follows:

“The off-site plan must provide for measures to be taken in preparation for a chemical incident, or upon a chemical incident occurring, so that danger that may thereby arise to any person or property that is outside the premises to which the plan relates or the environment is avoided.”

Information in the off-site plan should include all on-site plans. The following elements should be included:

- Location of premises;
- Process carried out;
- Number of personnel and general location on the site;
- Emergency equipment provided;

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- Alarm / warning systems;
- Communications systems - on-site, off-site and presence (or not) of a control centre;
- Characteristics of stored/produced hazardous material;
- Diagrammatic presentation of hazard zones;
- Planning assumptions - ie worst case likely events, means of determining when off-site plan activated, areas likely to be affected, timescale of events (how long), protection of the public and protection of the environment;
- Information relating to residents/sensitive areas of population - numbers of people, potential evacuations sites;
- Location of rivers/streams that may be exposed and information on spillage and drainage controls;
- Utilities (reticulated water, reticulated gas, reticulated electricity) associated with the site and what shut down or by-pass facilities exist. Particular reference to gas feedstock should be given;
- Transport Accidents - procedures to minimise damage, facilities that may be exposed e.g. road transport, rail transport, airports, vessels alongside;
- Role of Emergency Services - e.g. Fire Service, Police Service, Department of Emergency Service Chem Unit, Ambulance Service.

The Draft Emergency Response Plan should also provide details about:

- the roles and responsibilities of site personnel in the event of an emergency,
- emergency response procedures,
- who to contact, and
- reference and support material.

13. DEVELOPMENT AGREEMENTS

If the Proponent has entered into, or intends to enter into, an agreement for the supply of infrastructure service e.g. feedstock or electricity, or in respect of development contribution, reference should be made to such in this section.

14. REFERENCES

References should preferably be presented using the Harvard standard (refer to the Style Guide, Australian Government Publishing service). The Harvard method lists references by presenting in the following order : Author (Date of Publication) Title, Publisher, Place of Publication.

15. APPENDICES

A1. List of Advisory Agencies to the EIS

A list of Advisory Agency, with contact names and phone numbers, should be provided.

A2. Terms of Reference for the Preparation of the EIS

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A copy of the Terms of Reference should be included in the final report as an appendix.

A3. Consultation Process and Strategies

Tabulation of the consultation process.

A4. Technical Data and Studies