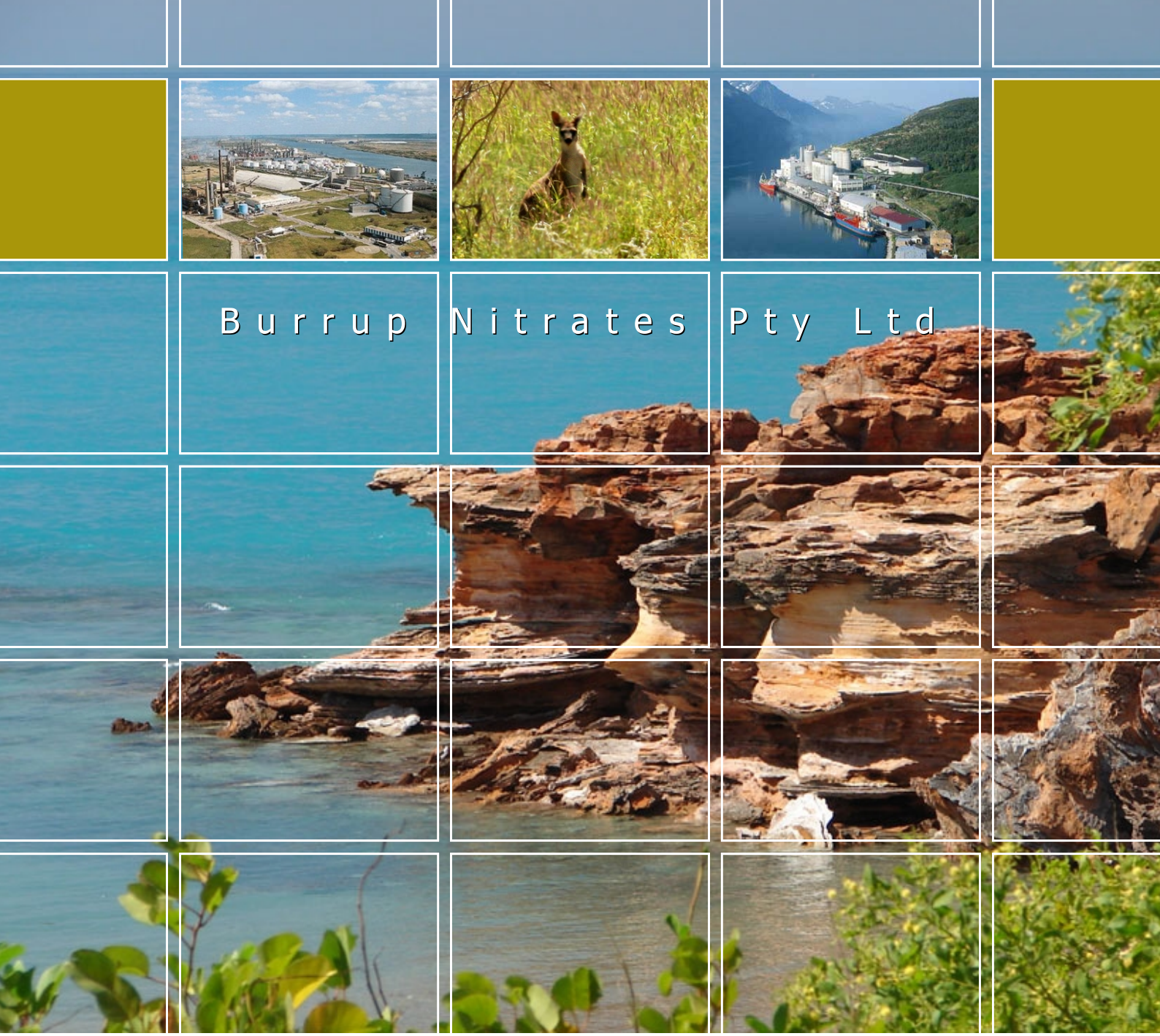


Burrup Nitrates Pty Ltd Proposed Technical Ammonium Nitrate Production Facility

Referral of Proposed Action
Environment Protection &
Biodiversity Conservation Act

October 2008

Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister. To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be taken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Marine environment (sections 23 and 24A)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
    - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
    - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's web site:

- the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.
- the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.
- the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act. Information is available on the Department's web site.

What information do I need to provide?

Schedule 2 of the EPBC Regulations sets out the information that must be included in a referral. Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in green text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment (Note: the Minister may decide not to publish information that is commercial-in-confidence). To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

- Faxed documents must be of sufficiently clear quality to be scanned into electronic format.
- Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment (**Note: the Minister may decide not to publish information that is commercial-in-confidence**).

The Department will write to you at the end of 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral, including:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action has, will have or is likely to have a significant impact it is called a *controlled action* and the particular matters upon which the action may have a significant impact (such as World Heritage or threatened species) are known as the *controlling provisions*.

The proposed action is subject to a public assessment process before it can be considered for approval. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

Compliance audits

The Department may audit your project at any time to ensure that it was completed in accordance with the information provided in the referral or the particular manner specified in the decision. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes.

For more information

- call the Department of the Environment, Water, Heritage and the Arts Community Information Unit on 1800 803 772 or
- visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title: Burrup Nitrates Pty. Ltd.

1 Summary of proposed action

1.1 Short description

Burrup Nitrates Pty. Ltd. (BNPL) proposes to construct and operate a circa 350kTPA Technical Ammonium Nitrate Production Facility (TANPF) at Site D (the Site) within the King Bay/Hearson Cove Industrial Precinct on the Burrup Peninsula, Western Australia (WA), approximately 13km north west of Karratha (*Figures 1 and 2*). The Site is adjacent to the existing Burrup Fertilisers Pty Ltd (BFPL) Ammonia plant and covers an area of approximately 79 Hectares (Ha) over two lots. The proposed TANPF requires an approximate footprint of 7 Ha with a total area, including laydown and access roads, totaling 23.7 Ha. Construction is planned to commence in October 2009 with the plant to be fully commissioned by March 2012. The purpose of the plant is to manufacture and supply TAN (the main raw material for ANFO (Porous Ammonium Nitrate + Fuel Oil) which is the most used and most economical civil explosive currently on the market) to the local market that exists in the Pilbara region of WA.

1.2 Latitude and longitude

The Site is located within a rectangular area bounded by the following four corner points:

Note: The footprint of the TANPF within the Site will be determined during the detailed engineering phase

Latitude			Longitude		
degrees	minutes	Seconds	degrees	minutes	seconds
20	37	18.42	116	47	7.58
20	37	21.42	116	47	33.3
20	37	53.93	116	47	23.38
20	37	53.93	116	47	7.84

1.3 Locality

The location and regional setting of the permit area is shown in *Figures 1 and 2*. The TANPF is proposed to be constructed at Site D, located within the King Bay/Hearson Cove Industrial Precinct on the Burrup Peninsula, Western Australia, approximately 13km north west of Karratha, 8 km north east of Dampier.

1.4 **Size of the development footprint or work area (hectares)**

The Burrup TANPF will include process plants (nitric acid and AN/TAN production), a utilities area, off-sites and storage for finished product and will occupy a maximum total fenced area of 23.7 Ha (237,000 m^2), see *Table 1*.

Table 1: TANPF Footprint

Footprint Breakdown	Maximum Area Required
TANPF Footprint	≈ 70,000 m^2 (7 Ha).
Lay Down Area	≈ 140,000 m^2 (14 Ha).
Approx access road length and width	≈ 27,000 m^2 (2.7 Ha)
Total area	≈ 23.7 Ha

Please note that the footprint outlined in *Table 1*, is an estimate. It is unlikely that the footprint required will exceed this estimate. The exact size of the TANPF will be determined in the concept study (due for completion by April 2009) which will take into consideration the amount of product to be stored and adequate safety distances.

1.5 **Street address of the site**

Site D, Burrup Industrial Estate, Village Road, Burrup Peninsula.

1.6 **Lot description**

The Site comprises both Lots 3017 and 3018 on deposited plan 50979, with Lot 3018 designated part Reserve 49120 for the purpose of industrial development and Lot 3017 designated as unallocated crown land. The primary interest holder is the State of Western Australia.

1.7 **Local Government Area and Council contact (if known)**

In developing the proposed TANPF, the project will be subject to State environmental assessment under Part IV of the *Environmental Protection Act 1986* (the EP Act) and possibly Australian government environmental assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). Works Approval and Licensing under Part V of the EP Act for the construction and operation phases of the project will also be required. The Site has been zoned 'Strategic Industrial' under the Shire of Roebourne Town Planning Scheme (TPS) No. 8. As outlined within the Roebourne TPS development is not permitted unless the Council has granted planning approval after giving notice in accordance with *Clause 4.3* of the TPS. The Shire of Roebourne have already been informed of the development and it is BNPL's endeavour that The Shire of Roebourne will continue to be kept informed of developments throughout the project.

1.8 **Timeframe**

The Burrup TANPF is scheduled to be operating by March 2012. This schedule is based around the key milestones highlighted in *Table 2*.

Table 2: Indicative Development Schedule[1]:

Project Phase	Commencement	Completion
Environmental Approvals	October 2008	September 2009
Construction	October 2009	December 2011
Commissioning	November 2011	March 2012
Operation	March 2012 - 2032 (minimum)	
Decommissioning	4-6 months after the plant's end of life	

1.9	**Alternatives**	X	No
			Yes, you must also complete section 2.2
1.10	**State assessment**		No
		X	Yes, you must also complete Section 2.4
1.11	**Component of larger action**	X	No
			Yes, you must also complete Section 2.6
1.12	**Related actions/proposals**	X	No
			Yes, provide details:
1.13	**Australian Government funding**	X	No
			Yes, provide details:

[1] May vary based on approvals timelines, delivery of long lead items and other personnel and resource constraints.

2 Detailed description of proposed action

2.1 Description of proposed action

Site Location

The TANPF is proposed to be located at Site D in the King Bay/Hearson Cove Industrial Precinct on the Burrup Peninsula, which is approximately 13 km north-west of Karratha. This area lies within the greater Burrup Industrial estate which provides almost 1400 Ha of industrial land to prospective tenants.

It is envisaged that the proposed TANPF will have an approximate footprint of 23.7 Ha within the 79 Ha of Site D, which is adjacent to the existing BFPL Ammonia plant. At this stage, the exact layout and footprint within Site D has not been determined and will be decided based on further optimisation studies.

The plot plan will be established with an aim to minimize distances between connected plant sections, distance between bagging and storage area, and distance to existing critical installations. Note that, the plant location and layout will be further optimised and evaluated based on factors such as blast pressure calculations, detailed risk and safety studies.

In terms of access roads for the TANPF, a road connecting from Village Road (North of Site D) will be built.

The Site is located adjacent to the existing BFPL Ammonia plant, which the proponents for the TANPF constructed, owns and operates. The choice of location for the TANPF enables significant sharing of services and utilities between BFPL and BNPL.

The proposed Site location is illustrated in *Figures 1 and 2*.

TANPF Description

The description below is based on the feasibility study and will be adjusted during the concept study. However, the capacity of the main process units will not be changed.

The proposed TANPF will have a production capacity of circa 350kTPA or 960 MTPD. The development will comprise three major manufacturing components each producing a separate product in the manufacturing process.

The TANPF will utilise existing infrastructure and utilities in the area to ensure it is commercially beneficial and provides the required availability to support the plant operations. The main raw material ammonia will be supplied by the BFPL plant via a connecting pipeline.

The facilities include, but are not limited to:

- Main Process Units

  - Nitric Acid (NA) Plant with power generation and a capacity of 760 MTPD NA (as 100 wt %)
  - Ammonium Nitrate (AN) Solution Plant with a capacity of 960 MTPD AN (as 100 wt %)
  - Technical Ammonium Nitrate (TAN) Prilling Plant that has a capacity of 915 MTPD prilled TAN (as 100 wt %)

The AN solution plant will have a capacity matching the NA plant capacity, i.e. 960 MTPD (as 100 wt %). The balance between 960 MTPD and 915 MTPD may be sold as AN solution.

- Offsite

  - Bagged TAN Storage having a capacity of 1800 MT
  - Bulk TAN Storage having a capacity of 12000 MT
  - Bagging facility
  - Truck Bulk Loading System

- Utilities

  - *Table 3* below documents plant utilities and their possible sources.

Table 3: Plant Utilities

Utility	Onsite	If Offsite, Where
Sea Water Supply	No	Water Corporation
Sea Water Cooling Tower	Yes	
Closed Sweet Water Cooling System	Yes	
Desalination Water Supply	No	Water Corporation
Demineralisation plant with polishing unit	Yes	
Waste water handling	Yes	BNPL will have a waste water treatment facility within the plant. Waste water will then be discharged to the Water Corporation facility
Electrical Power Supply	No	BFPL
Electrical Power distribution system	Yes	
Emergency Power System	Yes	
Start-up steam	No	BFPL
Start-up steam superheater and steam grid	Yes	
Instrument Air system	Yes	
Working Air system	Yes	

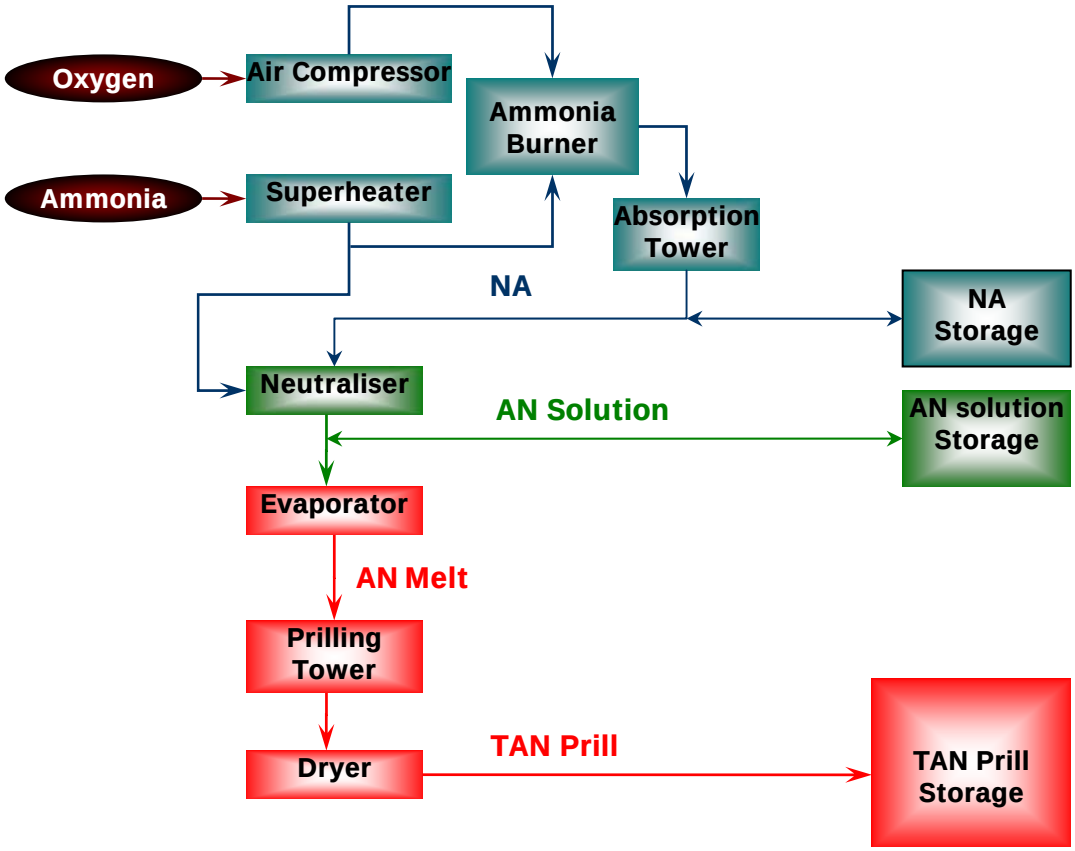
- Buildings

  - Product Storage
  - Stores (raw materials, consumables, spares etc)
  - Workshops
  - Central Control Room
  - Laboratory
  - Safety and Security Gatehouse
  - Administration Office and Staff amenities

Process Description

Figure 3 below represents a simplified visual illustration of the TAN process. This is followed by an overview of each section within the TANPF.

Figure 3: TAN Production Process



Legend

	Nitric Acid Plant
	Ammonium Nitrate Solution Plant
	Technical Ammonium Nitrate Prilling Plant

Nitric Acid Plant

The NA plant is likely to be designed based on the dual pressure method (to be confirmed in the concept study) and will:

- Have a capacity of 760 MTPD;
- Require Ammonia and Oxygen (air) as raw materials;
- Be designed to operate between 60 and 100% load; and
- Produce NA (approximately 60% concentration) that will be sent to the AN solution plant

The following outlines the various unit operations that exist within the proposed NA plant.

Ammonia / Air Pretreatment

Air is initially filtered in a two-stage filter system. This is followed by compression in an air compressor that doesn't require any inter-stage cooling. The compressed air is then split into two sections with the primary air going to the ammonia burner while the secondary air is sent to the nitric acid bleacher.

Liquid ammonia feed is evaporated, superheated (using steam) and filtered to remove impurities. The superheated ammonia is then injected into the primary air and mixed before being fed to the ammonia burner.

Nitric Acid Synthesis

The compressed air/ammonia mixture enters the burner and passes through a gas distribution system. At the platinum gauzes, ammonia is combusted to Nitrogen Oxide at a temperature around 890 to 900 °C.

In the downstream piping and equipment, NO is oxidized to NO_2 generating additional heat that is used in the heat recovery network.

The gas is cooled down further and condensed, forming nitric acid with around 40% by weight in the weak acid condenser. The acid is then separated from the process gas and pumped to the appropriate tray in the absorption tower.

The process gas is compressed to the selected absorption pressure. The compressed gas is used to heat the tail gas. In the absorption tower, Nitrogen Oxide (NOx) gases are absorbed into water to form NA. The NOx level in the gas leaving the absorber is expected to be approximately 150 ppm, depending on pressure and chilled water temperatures.

The acid concentration will be optimized to match the AN plant requirements, but will be approximately 60% by weight. Heat generated from the acid production operation is removed into the chilled water and sweet water cooling loops.

Nitric Acid Post-Treatment

BNPL will provide an off gas treatment facility so that all gas emissions will comply with environmental guidelines.

Ammonium Nitrate Solution Plant

The AN solution plant is likely to be designed based on the Kaltenbach Thuring process (to be confirmed during the concept study) and will:

- Have a capacity of 960 MTPD
- Require Ammonia and NA as raw materials; and
- Produce AN solution that is either sent to the prilling facility or stored

The following is an overview of this process.

Ammonium Nitrate Synthesis

Gaseous ammonia at about 70 °C and liquid nitric acid (approximately 60 wt%) at ambient temperature are injected into the bottom part of a neutralizer operating at pressure below 4 barg. The reaction is exothermic in nature and requires good control of feeds. The molar ratios of reactants are controlled automatically. Nitric acid flow controls the main flow of ammonia.

Heat generated by reaction brings the synthesised ammonium nitrate up to 160-180 °C and eliminates a fraction of water. In the reactor approximately 80 wt% Ammonium Nitrate solution is generated. Further concentration of up to approximately 90 wt% can be achieved using process steam generated in the neutralizer.

Technical Ammonium Nitrate Prilling Plant

In order to generate products of the specified properties, a number of unit operations are required, as described below.

Ammonium Nitrate Solution Concentration

The AN solution from the neutralizer is sent to a falling film evaporator that operates under vacuum. Evaporation ultimately results in a product concentration up to 96.5 wt% AN.

Additive Preparation

To produce the higher density grade AN, an additive known as permalene is required. This permalene solution (25%) is prepared from the raw materials boric acid, ammonium sulphate and diammonium phosphate. On the other hand, lower density AN is produced by the introduction of an organic additive. Note that for safety reasons, this organic additive is introduced just before the prill nozzle. The additives are either produced on site or are delivered as ready-made chemicals.

Prilling

The AN solution is pumped to the top of the prilling tower. Here, the solution flows by gravity to the prilling nozzles where they form droplets that crystallize as they fall from the top of the tower. The cooling air required for crystallization of the AN is recycled to limit atmospheric emissions, while cool and hot air generated is reused via a series of unit operations.

Drying

Prills exiting the prill tower are directed to the drying section which is dedicated to reducing the moisture content from 3 - 4 wt% to 0.05 – 0.2 wt%, depending on grade. This is achieved via either co-current or counter current dryers which are again dependant on the specified product grade. This unit operation removes most of the water present and results in a porous product.

Cooling and conditioning

Dried prills are screened before being fed to the fluidised bed cooler. Oversizes and fines are removed and recycled while the on-spec prills are cooled to the optimal storage temperature. The fluidised bed cooler is a two stage cooler with intermediate air recycle. The air usage in this section is also integrated to other sections of the facility which is a good means of achieving higher economic and environmental viability. The cooled product is finally sent to a coating drum where anti caking agents are sprayed on.

Bagging and storage

The two types of storage facilities proposed for this project are a bagged product storage facility and a bulk storage facility. The former is envisaged to have a storage capacity of 1800 MT while the latter will have a capacity of 12000 MT. Other storage units, including an NA and an AN storage tank, will be in place to ensure that the NA plant will be able to operate independently from the AN solution/TAN prilling plant operations and to allow intermediate storage between TAN production and bagging.

Final product leaving the processing unit will be conveyed to the bulk storage or directly to the truck loading area. The truck loading can also be fed from the bulk storage using a front end loader and conveying system. Products that are to be bagged will also be reclaimed from the bulk storage and conveyed to the bagging plant.

Forklifts will be used to transport bagged products to the product storage building. Bagged products will be transported to customers using trucks.

Bulk material will be transported to the consumers by trucks only, which will be loaded using a system consisting of front loaders, bucket elevators and silos in combination with a truck weighing system. Approximately 15 trucks (~70 MT capacity) will operate per working day. (i.e. 12 hours of operation.)

AN solution may be loaded on trucks from the AN storage tank which will be provided with a necessary loading system. If AN solution is sold, approximately 3 - 4 trucks per day at 25 MT per truck will be required.

Project Timeline

Plant construction is projected to begin in October 2009. The subsequent sections outline the activities that are envisaged to occur from the construction phase right through to decommissioning of the TANPF.

- Construction - Plant construction will take approximately 26 months with the manning level changing over the entire period. During peak period, approximately 650 persons (to be confirmed after the concept study) will be on site while the mean construction manning will be approximately 400 persons (to be confirmed after the concept study). These numbers include all categories of personnel (skilled and semi skilled).

- Commissioning **–** Commissioning is scheduled to take 5 months and will start 3 months prior to mechanical completion. To assist the contractor (who has overall responsibility) with commissioning, suppliers of the main equipment will be invited to have an involvement in commissioning the TANPF. Also note that the plant operators will play a role in the commissioning phase as a form of advance training.

- Operations - Although it is likely to operate for a much longer period, the TANPF will be designed for a minimum lifetime of 20 years. It will have an annual uptime of 90% minus the provision of any downtime due to market reasons or other reasons that are not related to TANPF operations. An inter-stage NA storage tank will allow the NA plant and AN/TAN plant to operate independently for up to two days. This is deemed to be adequate in terms of time, for plant maintenance (e.g. catalyst change in NA plant, necessary cleaning in the TAN plant etc.). When the NA plant is shutdown, the necessary steam to maintain the AN/TAN production will be provided by BFPL. The total manpower during TANPF operations will be ~60 personnel. These are full time employees based on BNPL's best practice. Certain positions will be outsourced, e.g. in bagging, maintenance, transport and are not included in this figure. Note that the TANPF will be operated in compliance with statutory requirements.

- Decommissioning - Decommissioning activities will involve the recovery of catalyst (platinum) from the heat exchangers and vessels in the nitric acid plant. Since exhaust air cannot be cleaned 100%, minimal nitrate downfall is expected. The decommissioning phase will last approximately 4-6 months with an average manning level of ~20 personnel. Note that the TANPF is not considered to have any environmental poisons.

Effluents/ Emissions/ Solid Wastes

The TANPF will be designed to meet statutory requirements for all emissions as a minimum. A waste water treatment facility will be operating on site to treat all waste water produced by the TANPF. This waste water will then be discharged to the Water Corporation facility in compliance with the EPA set operational discharge standards for the Water Corporation Waste Water treatment facility.

Nitric Acid plant

- Emissions to atmosphere

For the NA plant, treated off gas will be vented to the atmosphere in compliance with environmental guidelines.

N_2O emissions will be less that 100 ppm while NOx emissions will be below 75 ppm (to be confirmed during the concept study). In addition to continuous emissions, fugitive emissions of NOx are also expected to occur during filling of the nitric acid storage tank and some emission of ammonia gas when the plant is shut down and equipment is being purged.

- Emissions to Water

Intermittent emission of Nitrogen is expected to occur during blow down and draining of equipment. Nitric acid spills will be contained within bunds and drained into a tank. Apart from that, other procedures will be employed intermittently to ensure minimal emissions to water and to meet statutory requirements.

Approximate emission values will be 1.8 kg of nitrate nitrogen (NO_3-N) / day, 3.3 kg ammonium nitrogen (NH_4-N) / day, and 0.12 kg phosphates / day (to be confirmed during concept study).

- Solid waste

Catalysts will be recovered and reused for the production of new catalysts. Similarly, oil residue and sludge from the heat exchangers and storage tanks will be recovered.

Ammonium Nitrate Solution / Prilling plant

- Emissions to atmosphere

Continuous emissions will be cleaned in several stages culminating in a common scrubber that vents to the atmosphere to meet statutory requirements. Emission figures are dependent on the AN neutralisation technology and will be confirmed during the concept study.

- Liquid effluents

Process condensates will be used in the NA plant and the remaining (about 10 MT/h) will be treated within the TANPF to meet statutory requirements.

2.2 Alternative locations, time frames or activities that form part of the referred action

The location of the TANPF footprint within the Site has not yet been determined. The location of the footprint will be decided after the concept study has been completed in April 2009 and will be based on the optimal location taking into consideration the product to be stored, adequate safety distances to surrounding amenities and the likely affect on the environment.

There are no alternative sites or activities for the proposed TANPF.

2.3 Context, planning framework and state/local government requirements

The proposed TANPF will be subject to numerous Commonwealth and State legislative requirements. The *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*), is the principal statute for the protection of environmental matters of national significance. Other relevant Commonwealth statutes and regulations include:

- *Australian Heritage Council Act 2003*;
- *Quarantine Act 1908*;
- *National Greenhouse and Energy Reporting Act 2007; and*
- *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989.*

The proposed TANPF will be constructed and operate entirely on the mainland within State owned land. The *Environmental Protection Act 1986* (EP Act) and its regulations are the principal statutes in Western Australia that provides the tools for environmental protection in the State. Other Western Australian statutes that may be relevant to the proposed development include:

- *BushFires Act 1954;*
- *Contaminated Sites Act 2003;*
- *Wildlife Conservation Act 1950*;
- *Conservation and Land Management Act 1984*;
- *Aboriginal Heritage Act 1972* and Regulations 1974*;*
- *Dangerous Goods Safety Act 2004;*
- *Soil and Land Conservation Act 1945* and Regulations 1992*;*
- *Agriculture and Related Resources Protection Act 1976;* and
- *Health Act 1911*.

At a state level the Environmental Impact Assessment (EIA) for this project is required to undergo assessment by the Environmental Protection Authority (EPA) under the Western Australian EP Act. A referral will be submitted to the EPA, who will set a level of assessment for the EIA to be undertaken.

Following environmental approval a Works Approval will be obtained under the provisions of the Western Australian EP Act. The proposed TANPF will fall under *Part 1* of *Schedule 1* of the EP regulations and will require a works approval for the construction phase and a license for the operational phase. Approval for the project under the EPA assessment must be issued by the Western Australian Minister for Environment before a works approval (or any others such as development approvals) is granted. A Works Approval application will be submitted to the WA Department of Environment and Conservation (DEC), who will assess the application and set the conditions under which construction can be undertaken.

2.4 Environmental impact assessments under Commonwealth, state or territory legislation

As outlined in *Section 2.3*, BNPL will complete an EIA and document the findings of this EIA in a formal statutory environmental assessment report for the State (process administered by the EPA) and if required, Commonwealth (administered by Department of Environment, Water, Heritage and the Arts – DEWHA). This report will be considered by the relevant government authorities to determine whether the proposed activity should proceed, and under what conditions.

Stakeholder Engagement

A stakeholder engagement plan has been developed for the project. The Plan provides a framework for stakeholder engagement that has already commenced, will continue throughout the approvals phase and will continue through the construction and operational phases. The objectives of the Plan are to:

- identify known and potential stakeholders and project issues;
- identify BNPL actions and responsibilities for implementing engagement; and
- prepare and conduct engagement with stakeholders, identifying concerns and issues and gathering key informant opinions. At present, BNPL is planning to conduct a stakeholder meeting in Karratha in October 2008.

Under the current schedule, meetings with government stakeholders in Perth and Canberra, have been conducted (or are scheduled) from September 2008 onwards. These include the EPA Chair, Department of Industry and Resources (DoIR), Office of Development Approvals Coordination (ODAC), the Premier of WA and the Minister for State Development, the local Shire of Roebourne and DEWHA.

A stakeholder consultation meeting with the local community of Dampier and Karratha is also being scheduled for October 2008.

Stakeholder engagement will be informed by, and inform, the socio-economic component of the EIA. The purpose of this will be to analyse and understand the likely impacts of the TANPF on the persons and communities in the area of the project, including the towns of Dampier and Karratha. Based on the results of the Karratha stakeholder meeting and the socio-economic assessment, BNPL may consider additional public consultation, if necessary.

2.5 Consultation with Indigenous stakeholders

The project will be located in the Burrup Industrial Estate, which exists under a 2003 agreement between the State government and three Aboriginal Groups: the Ngarluma Yindjibarndi, Yaburara Mardudhunera and Wong-goo-tt-oo peoples (since expanded to include five groups). Under the agreement, the State Government compulsorily acquired native title rights and interests in the Burrup Peninsula. The Agreement allows for major industrial development to proceed at the southern end of the Burrup Peninsula and, *inter alia*, includes the protection of Aboriginal heritage and imposes an Aboriginal employment and training obligation on proponents. Benefits that flow from the Agreement on behalf of the three aboriginal groups are managed by the Murujuga Aboriginal Corporation (MAC), incorporated in April 2006.

Arrangements are being made for BNPL to consult with indigenous stakeholders. A focus on indigenous stakeholders has been included within the stakeholder engagement plan.

In addition, BFPL, (BNPL's joint venture partner), has a long standing relationship with indigenous stakeholders of the area through the development and operation of the BFPL Ammonia Plant, located immediately to the west of the proposed TANPF Site. BFPL's relationship with local indigenous stakeholders is undertaken primarily through Mr. Wilfred Hicks who acts as its Aboriginal Liaison Officer. BNPL will utilise this long-standing successful relationship for its consultation with indigenous stakeholders.

2.6 A staged development or component of a larger project

Not Applicable

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

The proposed TANPF is **not** located in or adjacent to any World Heritage Areas.

Nature and extent of likely impact

The proposed TANPF will **not** have a significant impact on the world heritage values of a declared World Heritage property.

3.1 (b) National Heritage Places

Description

The National Heritage Place, the Dampier Archipelago (including the Burrup Peninsula) borders the reserved Site D for BNPL's proposed TANPF. The Dampier Archipelago (including the Burrup Peninsula) was declared a listed place (105727) on the National Heritage List under the *EPBC Act* on 3rd July 2007 (see *Annex A*).

Parts of the Dampier Archipelago (including the Burrup Peninsula) contain dense concentrations of rock engravings. The rock engravings comprise images of avian, marine and terrestrial fauna, schematised human figures, figures with mixed human and animal characteristics and geometric designs. At a national level it has a diverse and dynamic range of schematised human figures, some of which are arranged in complex scenes (Australian Heritage Database, 2008).

Indications are that there is no rock engravings located on Site D. This will be confirmed.

The Dampier Archipelago was declared a National Heritage Site based on the following official values (Australian Heritage Database, 2008):

Criterion: A Events, Processes

- The different degrees of weathering of particular types of faunal engravings on the Dampier Archipelago provide a visual record of the course of Australia's cultural history through the Aboriginal responses to the rise of sea levels at the end of the last Ice Age.
- The 'Archaic Faces' on the Dampier Archipelago demonstrate the history of contact and shared visual narratives between Aboriginal societies in the Dampier Archipelago and inland arid Australia, and are significant in the course of Australia's cultural history.

Criterion: B Rarity

- At a national level, the Dampier Archipelago is outstanding for its diversity of engraved human forms and the antiquity of depictions of complex scenes showing human activity, which are rare at the national level.
- The Dampier Archipelago contains concentrations of rock engravings, which when compared with other similar sites in Australia are rare (McNickel 1985; Wright 1968; Stanbury and Clegg 1990).
- The density of standing stones, stone pits and circular stone arrangements on the Burrup Peninsula, and the diversity of these stone features across the Dampier Archipelago are rare at the national level (Vinnicombe 1987a).

Criterion: C Research

- Research demonstrates that on the Dampier Archipelago, areas where archaeological remains are associated with large numbers of engravings have potential to yield information that will contribute to an understanding of the nation's cultural history.
- The 'Archaic Faces' in the Dampier Archipelago have potential to yield information contributing to an understanding of the history of connections between the coast and the Western Desert.
- The different degrees of weathering and the large number of super-positioned engravings provides an opportunity to establish a relative chronology for motifs characteristic of the major style provinces in the Pilbara (Lorblanchet 1992; Vinnicombe 2002; McDonald and Veth 2005).

Criterion: D Principal characteristics of a class of places

- The Dampier Archipelago is a place where engravings of human forms representative of all of the style provinces in the Pilbara, the richest region of rock engravings in Australia, are found (McDonald and Veth 2005: Section 4; McCarthy 1968: vi).
- The standing stones in the Dampier Archipelago are important in a national context for the number of purposes they are known to have served.

Criterion: F Creative or technical achievement

- The finely executed animals identified to species level, the diversity of human forms and the panels of engravings showing scenes of human activity exhibit a high degree of creativity, particularly during the Holocene, which is unusual in Australian rock engravings.

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Nature and extent of likely impact

It is **not** expected that BNPL or the proposed TANPF would have a significant impact on the Dampier Archipelago (including the Burrup Peninsula) declared listed place (105727). The location of the TANPF is not within the declared listed place (105727) and it is not expected that any rock art will have to be moved, relocated or be directly affected by BNPL as there is none located within the proposed TANPF location at Site D.

Air emissions have been mentioned as a potential factor that could impact rock art on the Burrup Peninsula. The Burrup Peninsula Air Pollution Study 2006, was undertaken by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to "assess the likelihood that air pollution from the industrial area may damage the petroglyphs" in the Burrup Peninsula (CSIRO, 2006).

Measurements were collected for nitrogen gas, annual average ammonia concentrations, Sulphur dioxide concentrations, nitric acid concentrations, annual average particulate mass (TSP) concentrations, High frequency PM_{10} concentrations, dust deposition fluxes and total acid deposition fluxes. The results were that "the gas concentrations…showed that in all cases, concentrations were very low compared to polluted urban areas." (CSIRO, 2006)

TSP concentrations were "moderately enhanced over the local background Concentration" and were attributed to the ore loading and transport facilities in the area. Total acid deposition fluxes (calculated by measuring the wet and dry deposition of all nitrogen and sulphur species in the gas and aqueous phases) varied from a background of 14.3 meq m^{-2} yr^{-1} to 24.3 meq m^{-2} yr^{-1} with an average of 21.1 meq m^{-2} yr^{-1} at sites adjacent to the industrial areas. Although the enhancement of acid deposition fluxes from the background to the industrial areas was observable it was small. The absolute fluxes were of the magnitude that would only affect soil or rock that is in the most sensitive class of critical loads. In fact, the Burrup area is in a critical load class that can cope with a deposition flux of about 200 meq m-2 yr-1, and since this is significantly more than the observed deposition fluxes at the sites they are unlikely to cause any deleterious effects to rock or rock art on the Burrup Peninsula (CSIRO, 2006).

Based on these conclusions, BNPL do not believe that the emissions from the proposed TANPF to the Burrup airshed will alter the conclusions of the CSIRO 2006 study. Nonetheless, the EIA will document the air quality evaluation undertaken as part of the environmental assessment of this project.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The proposed TANPF does **not** contain any declared Ramsar Wetlands or Wetlands of International Significance.

Nature and extent of likely impact

The proposed TANPF will **not** have a significant impact on the ecological character of a declared Ramsar wetland.

3.1 (d) Listed threatened species and ecological communities

Description

A search of the DEWHA protected matters database was conducted on the 1st July 2008 to identify those threatened species and ecological communities that have previously been recorded within a ten kilometre radius of the TANPF Site. A summary of 'listed' 'threatened' species recorded from the database search is shown in *Table 4*. Eleven threatened species, 7 Marine and 4 Terrestrial (*Table 4*) listed under the *EPBC Act* have been identified as occurring within the vicinity of the Site. A complete list of DEWHA database records including 'listed' species is detailed in *Annex B*.

Table 4: Matters of National Environmental Significance occurring within the vicinity of the Site

Matters of National Environmental Significance – Threatened Species				
Type	**Threatened Species**	**Status**	**Type of Presence**	**Marine/Terrestrial**
Birds	*Macronectes giganteus* Southern Giant-Petrel	Endangered	Species or species habitat may occur within area	Marine/Terrestrial
Mammals	*Dasyurus hallucatus* Northern Quoll	Endangered	Species or species habitat may occur within area	Terrestrial
	Megaptera novaeangliae Humpback Whale	Vulnerable	Species or species habitat known to occur within area	Marine
	Rhinonicteris aurantius (Pilbara form) Pilbara Leaf-nosed Bat	Vulnerable	Species likely to occur within area	Terrestrial
Reptiles	*Caretta caretta* Loggerhead Turtle	Endangered	Species or species habitat likely to occur within area	Marine
	Chelonia mydas Green Turtle	Vulnerable	Species or species habitat may occur within area	Marine
	Dermochelys coriacea Leathery Turtle, Leatherback Turtle, Luth	Vulnerable	Species or species habitat may occur within area	Marine
	Eretmochelys imbricata Hawksbill Turtle	Vulnerable	Species or species habitat may occur within area	Marine
	Liasis olivaceus barroni Olive Python (Pilbara subspecies)	Vulnerable	Species or species habitat may occur within area	Terrestrial
	Natator depressus Flatback Turtle	Vulnerable	Breeding likely to occur within area	Marine
Sharks	*Rhincodon typus* Whale Shark	Vulnerable	Species or species habitat may occur within area	Marine

In addition to the EPBC search results the *Draft Burrup Peninsula Proposed Conservation Reserve Management Plan* (DEC 2006) lists the Northern Quoll (*Dasyurus hallucatus*) and Olive Python (*Dermochelys coriacea*) as being 'resident' within the Burrup Peninsula.

No threatened ecological communities were identified from the database search as occurring within a ten kilometer radius of the Site. Based on the results of previous flora surveys and vegetation mapping conducted on the Burrup Peninsula by Trudgen (2002), it is unlikely that listed threatened ecological communities occur within the Site.

The majority of threatened species identified as potentially occurring within the area of the proposed TANPF are marine (e.g. cetaceans, turtles, birds and whale sharks). These species may use the areas off Hearson Cove (1000m east of the Site) for feeding, breeding, nesting or resting.

Birds

The Southern Giant-Petrel (*Macronectes giganteus*) is a marine bird that occurs in Antarctic to subtropical waters. The Southern Giant-Petrel breeds on six subantarctic and Antarctic islands in Australian territory; Macquarie Island, Heard Island and McDonald Island in the Southern Ocean, and Giganteus Island, Hawker Island, and Frazier Island in the Australian Antarctic Territories (EABG 2001, Woehler et al. 2001; Woehler et al. in press). In summer, the Southern Giant-Petrel predominantly occurs in subantarctic to Antarctic waters, usually below a latitude of 60° south in the South Pacific and southeast Indian Oceans, or 53° south in the regions of Heard Island and Macquarie Island. Throughout the colder months, immatures and most adults disperse widely, with Antarctic colonies becoming completely deserted during winter. The winter dispersal is circumpolar, extending north from 50° south to the Tropic of Capricorn (23° south) and sometimes beyond these latitudes. The key threat to the Southern Giant-Petrel is long-line fishing and disturbance of breeding sites (DEWHA, 2008a).

Mammals

Humpback whales (*Megaptera novaeangliae*) have a wide distribution and have been recorded from the coastal areas off all Australian states except the Northern Territory (Bannister *et al,* 1996). Humpback whales migrate north and south along the eastern and western coasts of Australia from calving grounds in the tropical north to feeding grounds in the Southern Ocean (DEH, 2006). Peak migration in the vicinity of the permit area occurs from late July to early September. The DEWHA's protected matters database indicates that humpback whales humpback habitat known to occur within area (DEWHA, 2008b).

The Northern Quoll (*Dasyurus hallucatus*) is restricted to the Pilbara and Kimberley regions in Western Australia. In the Pilbara region, the species distribution is now considered to be fragmented and mostly confined to the larger conservation reserves as well as to the Burrup Peninsula. The Northern Quoll makes its dens in rock crevices, tree holes or occasionally termite mounds, and is predominantly nocturnal.

The Pilbara Leaf-nosed Bat (*Rhinonicteris aurantius (Pilbara form)*) occurs in less than ten localities in the Pilbara and one in the Gascoyne (Rangelands NRM region, Western Australia). There are five known roost sites, all in the east Pilbara consisting of abandoned mines, deep and partially flooded mines and smaller less complex mines and two natural roost sites in the Gascoyne (a cave, and a fissure beneath an ephemeral waterfall, both in Barlee Range National Park). The key threat to the Pilbara Leaf-nosed Bat is the loss of its remaining roost sites.

Reptiles

Snakes

The Olive Python (Pilbara subspecies) (*Liasis olivaceus barroni*) is restricted to ranges within the Pilbara region and north-western Western Australia, such as the Hamersley Range, and islands of the Dampier Archipelago. The Olive Python is known to occur at 17 locations within the Pilbara (Pearson 1993). Four populations occur at Pannawonica, Millstream, Tom Price and Burrup Peninsula (Pearson, D. 2001, pers. comm.). The Olive Python prefers deep gorges and water holes in the ranges of the Pilbara region (Pearson 1993). Individuals are usually in close proximity to water and rock outcrops (D.Pearson 2001, pers. comm.). The breeding season occurs in June and July, with males moving long distances in search of females. Eggs are laid in November and hatch approximately two months later in mid-Jan. (D.Pearson 2001, pers. comm.)(DEWHA, 2008c).

Turtles

Five species of marine turtles listed as threatened species (Four vulnerable and one endangered) and migratory under the EPBC Act may occur within the area of the Site. These are the Loggerhead turtle (*Caretta caretta*), Green turtle (*Chelonia mydas*), Leatherback turtle (*Dermochelys coriacea*), Hawksbill turtle (*Eretmochelys imbricate*) and the Flatback turtle (*Natator depressus*). Sea turtles, especially green turtles, undertake extensive migrations and low numbers of individuals may transit or breed at Hearson Cove, 700m to the west of the Site.

Loggerhead turtles have a global distribution throughout tropical, sub-tropical and temperate waters (Marquez 1990). It occurs in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Aust. (Limpus et al. 1992; Prince 1994b; Limpus 1995a). In WA, low intensity nesting occurs on Murion Island and the beaches of the North West Cape (Prince 1993, 1994b). There has been one reported loggerhead nesting at Ashmore Reef (Guinea 1995).

Green turtles are found in tropical and subtropical waters throughout the world (Marquez 1990; Bowen *et al.* 1992) but normally remain within the northern and southern limits of the 20°C isotherms (Marquez 1990). The closest known breeding/nesting grounds to the permit area is in Arnhem Land, where some nesting occurs on the Coburg Peninsula from Gove to the northern edges of Blue Mud Bay, the northern beaches of islands in the Sir Edward Pellew group and Groote Eylandt in the western Gulf of Carpentaria (Chatto 1998).

The Leatherback turtle has the widest distribution of any marine turtle, (Cogger *et al.* 1993) and can be found in tropical, subtropical and temperate waters throughout the world (Marquez 1990). Nesting occurs on tropical beaches and subtropical beaches (Marquez 1990) but no major centers of nesting activity have been recorded in Australia, although scattered isolated nesting (1-3 nests per annum) occurs in southern Queensland and Northern Territory (Limpus & McLachlan 1994).

Hawksbill Turtles are found in tropical, subtropical and temperate waters in all the oceans of the world. Nesting is mainly confined to tropical beaches (Marquez 1990). In Australia there are two nesting populations (Great Barrier Reef (GBR)/Arnhem Land and NW Shelf) that are genetically distinct from each other and from populations in other countries, indicating little interbreeding between populations (Broderick et al. 1994). Major nesting in Western Australia occurs at Varanus Island and Rosemary Island (Prince 1993, 1994b).

The Flatback turtle is found only in the tropical waters of northern Australia, Papua New Guinea and Irian Jaya (Spring 1982; Zangerl *et al.* 1988) and is one of only two species of sea turtle without a global distribution (DEWHA, 2008d). Nesting is confined to Australia and six major aggregations are recognised (Limpus 1995a). These include western Arnhem Land and the Kimberley region of WA, and the NW shelf, WA around Barrow I (Prince 1994b).

Sharks

The Whale Shark (*Rhincodon typus*) is listed as vulnerable and migratory under the EPBC Act and may occur in the waters off Hearson Cove, though this is considered highly unlikely. The whale shark is the world's largest fish, and one of only three filter-feeding shark species. Whale sharks have a broad distribution in tropical and warm temperate seas. In Australian waters, they are known to aggregate at Ningaloo Reef and in the Coral Sea between March and July. The whale shark is a highly migratory fish and only visits Australian waters seasonally (DEWHA, 2008e). Whale sharks are not known to feed or breed in the vicinity of the permit area.

Nature and extent of likely impact

Flora and fauna habitats located within the 23.7 Ha footprint will be directly impacted from clearing activities. The footprint area includes all potential peripheral impacts on areas outside the infrastructure footprint from disturbance within laydown areas and service corridors.

No Threatened Ecological Communities (TECs) have previously been recorded within the Site.

Of those species listed in *Table 4* the Olive Pythonand Northern Quoll have previously been recorded within the Burrup Peninsula (DEC, 2006) while potential foraging habitat for the Pilbara Leaf-nosed Bat (*Rhinonicteris aurantius (Pilbara form)*) may be present within the Site.

The Site does not contain potential habitats for the marine species listed in *Table 4*. The proposed development would occur some 700m to the west of nearby Hearson Cove and 2.5km to the east of King Bay and given the nature of the development these species and habitats are unlikely to be significantly impacted by the proposal.

Potential habitat for the Olive Python and Northern Quoll and Pilbara Leaf-nosed Bat may occur within the Site however, it is considered unlikely that the proposal would have a significant impact on these species. The potential impact of the proposal on each of these species is addressed as follows:

The Olive Python

The Olive Python is generally found in rocky areas or gorges and especially rocky habitat associated with water courses. Besides taking refuge in caves and rock crevices they also can be found in hollow logs and burrows beneath rocks (Pilbara Pythons, 2008). Radio-telemetry has shown that individuals are usually in close proximity to water and rock outcrops (D.Pearson 2001, pers. comm.).The Site itself occurs within a low lying partly saline coastal flat which is known to be subject to inundation after rainfall, storm surges and extreme tides (see *Figure 4*).

Preferred rocky habitats and areas such as gorges, caves and rock crevices are not present within the Site with these areas generally occurring approximately 500 metres to the north and extending over much of the Burrup Peninsula. Limited potential habitat may be present within rocky areas to the south of the Site and it is considered that connectivity to potential habitats north of the Site would be maintained within the 700 metre strip of vegetation retained between Hearson Cove and the TANPF Site. Given the absence of the species preferred habitat requirements it is considered unlikely that the Site would represent a critical area of habitat for a local population of the species.

The proposal would result in the removal of approximately 23.7 Ha of sub-optimal habitat for the species and while it is possible that the Olive Python may utilise the Site as part of its broader habitat requirements within the local area it is considered unlikely, based on those habitat preferences outlined above, that the proposal would have a significant impact on a local population of the species.

The Northern Quoll

The Northern Quoll is described as being most abundant within rocky eucalypt woodland but is also known from a variety of habitat types, usually within 200 km of the coast where the species dens within tree hollows or rock crevices (Menkhorst & Knight 2001). While the Site itself does not support the species preferred rocky eucalypt habitat it is possible that the Site may comprise part of the species broader habitat requirements within the local area. Rocky habitats such as those occurring to the north and south are not known to occur within the Site and as such potential denning habitat is unlikely to be present within the Site. Accordingly, it is considered unlikely that the Site would represent a critical area of habitat for a local population of the species.

The proposal would result in the removal of approximately 23.7 Ha of sub-optimal foraging habitat for the species and while it is possible that the Northern Quoll may utilise the Site as part of its broader habitat requirements within the local area it is considered unlikely, based on those habitat preferences outlined above, that the proposal would have a significant impact on a local population of the species.

Pilbara Leaf-nosed Bat

Colonies of the Pilbara Leaf-nosed Bat are found in three distinct areas: in the mines of the eastern Pilbara; scattered throughout the Hamersley Range in smaller colonies; and in sandstone formations south of the Hamersley Range in a small number of significant colonies (Armstrong 2001). This includes the confirmed roosts of: Bamboo Creek mine, Copper Hills mine, Klondyke Queen mine, Lalla Rookh mine and one cave in Barlee Range; and 16 other likely permanent occurrences. Locations are defined as sites that support a colony, such as a cave or mine (DEWHA, 2008f).

The Site does not contain potential roosting habitat for the species however it is unknown if roosting habitat occurs elsewhere within the Burrup Peninsula. This is perhaps unlikely given the colony locations described above. Potential foraging habitat is likely to be abundant within the local area and while it is possible that the Site may provide some foraging habitat for the species it is unlikely that the removal of 23.7 Ha of potential foraging habitat would have a significant impact on a local population of the species.

The likely presence and potential impacts of the proposal on terrestrial threatened species, including those listed above, will be further considered through the completion of vegetation and fauna surveys within the Site. The surveys will include:

- Verification of background studies;
- Flora and fauna search;
- Low-level sampling of flora and fauna;
- A survey of flora and fauna habitats;
- Mapping of flora and fauna assemblages;
- Identification of potential impacts; and
- Recommended management strategies.

Consultation with the WA DEC regarding the timing and level of vegetation, flora and fauna surveys will be initiated.

All reasonable and practicable measures will be taken to clear vegetation in such a manner and to such an extent that the impacts on flora and fauna are minimised.

3.1 (e) Listed migratory species

Description

The migratory species recorded from the EPBC protected matters search as potentially occurring within the proposed TANPF Site is shown in *Table 5*. These species include cetaceans, turtles, birds and whale sharks that may be using terrestrial and aquatic habitats within the Burrup Peninsula area for feeding, breeding, nesting or resting. In addition to these species a number of migratory species listed under the Japan Australia Migratory Bird Agreement (JAMBA), China Australia Migratory Bird Agreement (CAMBA) and Republic of Korea Australia Migratory Bird Agreement (ROKAMBA) conventions have previously been recorded within the Burrup Peninsula or are known to occur within the area (DEC, 2006). These species also represent protected matters under the EPBC Act and are listed in *Table 6.*

Table 5: Migratory Species occurring within the vicinity of the Site

Matters of National Environmental Significance – Migratory Species			
Type	**Threatened Species**	**Type of Presence**	**Marine/Terrestrial**
Migratory Terrestrial Birds	*Haliaeetus leucogaster* White-bellied Sea-Eagle	Species or species habitat likely to occur within area	Marine/Terrestrial
	Hirundo rustica Barn Swallow	Species or species habitat may occur within area	Terrestrial
	Merops ornatus Rainbow Bee-eater	Species or species habitat may occur within area	Terrestrial
Migratory Wetland Birds	*Ardea alba* Great Egret, White Egret	Species or species habitat may occur within area	Marine/Terrestrial
	Ardea ibis Cattle Egret	Species or species habitat may occur within area	Marine/Terrestrial
	Charadrius veredus Oriental Plover, Oriental Dotterel	Species or species habitat may occur within area	Marine/Terrestrial
	Glareola maldivarum Oriental Pratincole	Species or species habitat may occur within area	Marine/Terrestrial

	Numenius minutus Little Curlew, Little Whimbrel	Species or species habitat may occur within area	Marine/Terrestrial
Migratory Marine Birds	*Apus pacificus* Fork-tailed Swift	Species or species habitat may occur within area	Marine/Terrestrial
	Ardea alba Great Egret, White Egret	Species or species habitat may occur within area	Marine/Terrestrial
	Ardea ibis Cattle Egret	Species or species habitat may occur within area	Marine/Terrestrial
	Macronectes giganteus Southern Giant-Petrel	Species or species habitat may occur within area	Marine/Terrestrial
Migratory Marine Mammals	*Balaenoptera edeni* Bryde's Whale	Species or species habitat may occur within area	Marine
	Dugong dugon Dugong	Species or species habitat likely to occur within area	Marine
	Megaptera novaeangliae Humpback Whale	Species or species habitat known to occur within area	Marine
	Orcinus orca Killer Whale, Orca	Species or species habitat may occur within area	Marine
	Sousa chinensis Indo-Pacific Humpback Dolphin	Species or species habitat may occur within area	Marine
	Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations)	Species or species habitat likely to occur within area	Marine
Reptiles	*Caretta caretta* Loggerhead Turtle	Species or species habitat may occur within area	Marine
	Chelonia mydas Green Turtle	Species or species habitat may occur within area	Marine
	Dermochelys coriacea Leathery Turtle, Leatherback Turtle, Luth	Species or species habitat may occur within area	Marine
	Eretmochelys imbricata Hawksbill Turtle	Species or species habitat may occur within area	Marine
	Natator depressus Flatback Turtle	Breeding likely to occur within area	Marine
Sharks	*Rhincodon typus* Whale Shark	Species or species habitat may occur within area	Marine

Table 6: JAMBA, CAMBA and ROKAMBA Listed Species

Matters of National Environmental Significance – Migratory Species			
Species	**JAMBA**	**CAMBA**	**ROKAMBA**
Oceanites oceanicus Wilson's storm petrel	√	X	X
Hirundo rustica Barn Swallow	X	√	√
Sula leucogaster plotus Brown booby	√	√	√
Ardea alba Great Egret, White Egret	√	√	X
Puffinus pacificus Wedge-tailed shearwater	√	X	X
Charadrius veredus Oriental Plover, Oriental Dotterel	X	X	√
Glareola maldivarum Oriental Pratincole	√	√	X
Numenius minutus Little Curlew, Little Whimbrel	√	√	√
Apus pacificus Fork-tailed Swift	√	√	√
Fregata ariel Lesser frigatebird	√	√	√
Ardea ibis Cattle Egret	√	X	X
Ardea sacra Eastern reef heron	X	√	X
Haliaeetus leucogaster White-bellied sea-eagle	X	√	X
Gallinago stenura Pin-tailed snipe	√	√	√
Limosa lapponica menzbieri Bar-tailed godwit	√	√	√
Numenius minutus Little curlew	√	X	√
Numenius phaeopus variegatus Whimbrel	√	√	√
Numenius madagascariensis Eastern curlew	√	√	√
Tringa stagnatilis Marsh sandpiper	√	√	X
Tringa nebularia Common greenshank	√	√	X
Tringa cinerea Terek sandpiper	√	√	√
Tringa hypoleucos Common sandpiper	√	√	√

Matters of National Environmental Significance – Migratory Species			
Tringa brevipes Grey-tailed tattler	√	√	√
Arenaria interpres interpres Ruddy turnstone	√	√	√
Calidris canutus rogersi Red knot	√	√	√
Calidris tenuirostris Great knot	√	√	√
Calidris alba Sanderling	√	√	√
Calidris ruficollis Red-necked stint	√	√	√
Calidris subminuta Long-toed stint	√	√	√
Calidris acuminata Sharp-tailed sandpiper	√	√	√
Calidris ferruginea Curlew sandpiper	√	√	√
Limicola falcinellus Broad-billed sandpiper	√	√	√
Phalaropus lobatus Red-necked phalarope	√	√	√
Pluvialis squatarola Grey plover	√	√	√
Charadrius mongolus Lesser sand plover	√	√	√
Charadrius l. leschenaultii Great sand plover	√	√	√
Sterna caspia Caspian tern	x	√	x
Sterna bengalensis Lesser crested	x	√	x
Sterna bergii Crested tern	√	x	x
Sterna hirundo Common tern	√	√	√
Sterna leucoptera White-winged black tern	√	√	√
Sterna anaethetus Bridled tern	√	√	x
Cuculus saturatus optatus Oriental cuckoo	√	√	x

Nature and extent of likely impact

Migratory marine mammals, reptiles (turtles) and sharks listed in *Table 4* are unlikely to be significantly impacted by the proposal. These species would not rely on the Site as part of their habitat requirements and clearing associated with the proposal would not affect nearby marine areas and habitats. BNPL will treat all produced wastewater on site in compliance with environmental operating licence conditions. Wastewater generated during operation will be discharged into the Water Corporation operated multi-user outfall pipeline.

The quality of wastewater at the outfall is strictly monitored by the Water Corporation. It is, therefore unlikely that wastewater from the TANPF would significantly impact locally occurring marine species or marine environments within King Bay.

Those migratory bird species listed in *Table 5* and *Table 6* above are considered to have the potential to utilise the Site and other areas within the Burrup Peninsula as part of their habitat requirements. These migratory birds primarily consist of aquatic species which would rely on habitats within nearshore area of the Burrup Peninsula such as tidal sand and mud flats within Hearson Cove and King Bay. The Site itself contains part of a saline coastal flat that is periodically inundated after extreme tides, storm surges or after extended heavy rainfall. As a result the Site may periodically support some foraging habitat for aquatic migratory species. The location of the saline coastal flat in relation to the Site is mapped in *Figure 4*.

The TANPF is proposed to be located as to avoid this low lying area where possible to avoid additional flood risk and to retain this habitat within the Site. As a result only a small portion of this habitat would be removed as a result of the proposal and saline coastal areas to the west and north (*Figure 4*) of the Site would be retained. The Site itself may comprise part of the matrix of aquatic habitats within the local area utilised by migratory species. As noted the removal of this habitat would be limited to a small area within the Site and while some seasonal foraging habitat may be removed as a result of the proposal it is unlikely that this habitat would be of significant importance to locally occurring migratory species.

To mitigate against any indirect impacts as a result of alterations to flow and flooding regimes it is proposed that site drainage be designed to maintain the periodic inundation of saline areas to the north and west of the Site, thereby preserving the seasonal habitat contained within the Site and surrounding areas.

For those terrestrial migratory bird species listed in *Table 5 and 6,* the removal of approximately 23.7 Ha of potential habitat is unlikely to represent a significant area of habitat for these species, or significantly increase habitat fragmentation. Similar habitats areas to those contained within the Site are likely to be abundant within the local area with areas of habitat also retained within the proposed Burrup Peninsula Conservation Reserve; accordingly, it is unlikely that the proposal would have a significant impact on those terrestrial migratory bird species under consideration.

3.1 (f) Commonwealth marine area

Description

Not Applicable.

Nature and extent of likely impact

The proposed TANPF development will **not** adversely affect Commonwealth marine areas.

3.1 (g) Commonwealth land

Description

Not Applicable.

Nature and extent of likely impact

The proposed TANPF development will **not** adversely affect Commonwealth land.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, or actions taken on Commonwealth land

3.2 (a)	**Is the proposed action a nuclear action?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.3 Other important features of the environment

3.3 (a) Soil and vegetation characteristics

Soils and Geology

The geology of the Burrup Peninsula has been previously investigated by the Geological Survey of Western Australia and has been described by O'Brien Planning Consultants (1994).

The Burrup Peninsula is composed mainly of an intrusive Proterozoic igneous rock outcrop known as the Gidley Granophyre, which is approximately 2,200 million years old. The main outcrop of Gidley Granophyre occurs in the Dampier Archipelago and the adjacent mainland, along basal unconformity of the Fortescue Group (Hickman, 1983). The base of the intrusion consists of a differentiated coarse-grained gabbro and the main body is a fine-grained granophyre. The gabbro weathers to a dark brown and the granophyre to a lighter red-brown, and both rock types are resistant to erosion and form aggregates of split boulder screes.

A large dolerite dyke is present in the King Bay Hearson Cove lineament. As a result there is less outcrop of the rhyadacite than in other areas of the Peninsula. The outcrops are generally located on the southern and eastern boundaries of the project lease.

A saline coastal flat is located in the middle portion of the Site indicating a soil profile of a low energy marine depositional environment. The soil profile is largely comprised of sandy silts to silty sands generally brown to grey in colour with occasional variations including green, yellow and red mottling. The sediments are typically organically rich and often contain a thin veneer of shelly lenses.

The soils of the area are generally alkaline as a result of the high carbonate content originating from marine sands and underlying calcrete bedrock.

Vegetation Characteristics

The following vegetation types with their corresponding vegetation assemblages may potentially be present within or in the vicinity of the proposed TANPF:

- **Lower Undulating Slopes with Shallow Incised Drainage Lines** - Mixed Shrubland over Low Open Shrubland over Closed Hummock Grassland over Herbland on lower undulating slopes with shallow incised drainage lines.

- **Coastal Flats** - High Open to Open Heath of *Acacia bivenosa* over Low Open Shrubland over mixed Closed Grassland over Herbs on the coastal flats. The coastal flats run parallel to the saline inlet to the south and the lower hill slopes to the north. Soils here become more sandy and slightly saline.

- **Drainage Lines and Broad Drainage Zones** - Shrubland to Open Heath of *Grevillea pyramidalis/A. inaequilatera* Low Shrubland to Low Heath over mid-dense Hummock Grass. Minor drainage lines occur within the coastal flats vegetation type as mentioned above.

- **Saline Inlet and Supratidal Flats** - Supratidal flats with *Halosarcia-Trianthema* succulent Dwarf Scrub. The saline inlet and supratidal flats run approximately east-west through the surrounding area. Included in this habitat is the inlet, much of which is not vegetated, and the vegetation immediately fringing the inlet.

3.3 (b) Water flows, including rivers, creeks and impoundments

There are no permanent surface water features on the Burrup Peninsula as creeks and rock pools are rainfall dependent. Minor drainage lines extend down the central western side and northern sections of the Site and drain into the south west to the lower level tidal mud flats and saline coastal flats of the south which drain westward to King Bay and Mermaid Sound, (see *Figure 4*).The soils of the lower slopes and saline coastal flats are highly permeable and will recharge groundwater.

During periods of extreme spring tides and storm surge the tidal flats and saline coastal flats are periodically inundated with seawater for up to several hours. Inundation also occurs after extended heavy rains within the area. The tidal action supports the King Bay mangrove community west of Burrup Road by providing sedimentation, seawater recharge to maintain prevailing salinity fields, nutrient delivery and recruitment of benthos (Semeniuk, 1994). Evaporation of seawater over the tidal mudflats east of Burrup Road result in surface salinities ranging from 90,000 ppm to 300,000 ppm (Semeniuk, 1994). Such concentrations are undesirable for the growth of mangroves.

As a result, the groundwater beneath the mudflats and saline coastal flats is typically shallow and hypersaline.

Considering these factors, the surface hydrology and processes on the tidal flats and saline coastal flats have **no** direct importance to the mangroves of King Bay (Semeniuk, 1994).

3.3 (c) Outstanding natural features, including caves

Site D does not contain outstanding natural features such as caves. The Site is situated near the base of high scree slopes on its north west and southern boundaries, part of an extensive high scree range, which rises to above 60 m above sea level in places and serves as a catchment for water during rainfall events. The range is cut by steeply inclined valleys, which occur along fault lines and minor drainage lines that feed into shallow drainage gullies through the Site, and then to the saline coastal flats before the inlet at King Bay.

The saline coastal flats form an east-west trending valley at approximately 4m AHD and divide the Peninsula into two separate units from King Bay in the west to Hearson Cove in the east. The invert of this valley is composed of marine sediment.

The five major landform features found on and adjacent to the Site include:

- A small area of high scree slope outside the north-western and southern borders of the Site;
- Uplands and upper hill slopes associated with the upper scree slopes (offsite);
- Gentle, low, undulating hill slopes with occasional small rock outcrops and shallow drainage gullies;
- Saline coastal flats; and
- Tidal inlet and associated saline flats.

3.3 (d) Gradient

The Site is located amongst saline coastal flats that are within an east-west trending valley at approximately 4m – 10m AHD and divide the Peninsula into two separate units from King Bay in the west to Hearson Cove in the east. The Site is predominately flat throughout, with shallow ephemeral drainage channels located within the Site. See *Figure 5*.

3.3 (e) Buildings or other infrastructure

The Burrup Peninsula has developed as a major industrial and port site in Australia. Buildings, infrastructure and sensitive receptors within close proximity to the Site are identified in *Table 7*.

Table 7: List of Facilities Adjacent to the proposed TAN Plant

Facility / Sensitive Receptors	Distance from TANPF1 (m)
North West Shelf Venture	3200 – 4000
Woodside LNG Pluto Future Development	3000 – 3600
Dampier Port Authority	4000 – 4300
King Bay Supply Base	2900 – 3500
Schlumberger Supply Base	2100 – 2700
Burrup Fertilisers PL	Adjacent, ammonia storage tanks more than 500m
Hearson Cove	1000 – 1500

1. The approximate distances from facility boundaries to the centre of the Site.

The north-south Burrup Road service corridor (see *Figure 1*) extends to the North West Shelf Joint Venture LNG plant in the north and incorporates a power transmission network, a domestic water pipeline and two high pressure underground gas pipelines.

No buildings or infrastructure currently exists within the Site, with the Burrup Ammonia plant and Water Corporation common user facility the only infrastructure currently located within King Bay-Hearson Cove Industrial Precinct.

3.3 (f) Marine areas

The marine environment of the Dampier Archipelago is rich in species and habitat diversity. Hearson Cove is located approximately 1000 to 1500 metres to the east of the Site while King Bay is approximately 3 kilometres to the west, these areas are likely to provide habitat for a variety of both threatened and non threatened fauna species. Marine habitats include shallow sand and mud flats and mangrove communities at King Bay. The mangrove communities support large populations of burrowing fauna and are important exporters of nutrients. The mangroves back onto mudflats that also provide habitat to algal communities, which contribute to primary production within the area.

The marine habitat that has the potential to be impacted by the proposed TANPF is the intertidal sand shoals, mud flats and mangroves in King Bay, approximately 3km to the west of the Site. Potential indirect operational impacts on the shoreline and nearshore habitats could result from the discharge of stormwater and other effluent discharges via the Water Corporation discharge pipeline.

The potential impacts associated with the return of treated wastewater discharges via the Water Corporation's outlet into King Bay are changes to:

- Temperature changes;
- Salinity (Total Dissolved Solids (TDS));
- Nutrients levels (PO4 and NH4);
- Methanol; and
- Antiscalants and biocides.

The Water Corporation's common user Burrup Peninsula seawater and brine disposal scheme is subject to several commitments set by regulators, of which Water Corporation is abiding by, to minimise the impact on the marine environment in King Bay.

BNPL will be bound by operating licence guidelines for discharging wastewater into the Water Corporation's common user facility.

Abiding by these set guidelines will minimise impacts on mangroves and the marine environment in King Bay.

3.3 (g) Kinds of fauna & flora

The following descriptions focus on the potential presence of important or unique fauna and flora within or in the vicinity of the proposed TANPF described in *Section 2.1*. The descriptions are based on a 2001 survey undertaken by Astron Environmental Pty Ltd of the site now occupied by the BFPL ammonia plant (immediately to the west of BNPL's proposed TANPF Site). This survey provides the most detailed, if outdated, indication of the vegetation, flora and fauna that may be encountered within the Site at this stage.

BNPL propose to conduct further investigations on fauna and flora based on advice from technical specialists and regulatory authorities as appropriate.

Flora

Various vegetation and flora studies have been undertaken on parts of the Burrup Peninsula. Trudgen (2002) subsequently provided a complete list of species, collated with records from previous surveys undertaken on the Burrup Peninsula over the past 25 years. A 2001 survey undertaken on the now occupied BFPL ammonia plant to the west of the Site (Astron 2001) provides the most detailed indication of vegetation that may be encountered within the TANPF Site.

There are at least 383 native vascular plant species from 54 families currently known from the Burrup Peninsula (Trudgen, 2002). The vegetation of the Burrup Peninsula is generally in very good or excellent condition, except in areas of coastal sand.

Trudgen (2002) identified 33 native plant species on the Burrup Peninsula that are neither rare flora nor priority flora, but that are of conservation interest for a number of reasons including populations being at the extent of their range or those for which there is a lack of scientific knowledge. It is unknown whether these species currently occur within the Site. The presence of rare or threatened flora species will be further clarified as part of targeted surveys undertaken within the Site as part of the environmental impact assessment for the proposal.

As well as the Astron (2001) survey, a search of the WA DEC Declared Rare and Priority Flora database has been undertaken. There are currently no known 'declared rare' (threatened) flora identified on the Burrup Peninsula, however ten regional species have been identified as WA DEC priority Flora. It is unknown whether these species exist within the Site. A summary of the results from this search is provided in *Table 8*, which identifies the threatened flora identified as occurring in the vicinity of the Site.

Table 8: DEC declared Threatened Flora occurring in the vicinity of the Site.

Species	Conservation Code *	Distribution
Ipomoea sp. A Kimberley Flora (L.J. Penn 84)	1	Dampier Peninsula
Nicotiana heterantha	1	Broome, Dampier Peninsula, Roy Hill, Mandora, Anna Plains
Stackhousia clementii	1	Bernier Is., Dorre Is., Gibson Desert, Beverly Springs, NT, SA, Gnaraloo Stn, Burrup Peninsula
Gomphrena pusilla	2	Dampier Peninsula, Pt Hedland
Nymphoides beaglensis	2	Dampier Peninsular, Beagle Bay, Lake Campion, Yabbagoody Clay Pan
Gymnanthera cunninghamii	3	Minilya, Dampier Archipelago, Boodarie, 80 Mile Beach, NT, Qld
Rhynchosia bungarensis	3	Hamersley Ranges, Chichester Ranges, Ashburton, East Lewis Island, Burrup Peninsula, Dampier Archipelago
Stylidium costulatum	3	Dampier Peninsula, Beverley Springs Stn, Mt Barnett Stn, Coulomb Point
Terminalia supranitifolia	3	Robe River, Burrup Peninsula, Dolphin Is., Bungaroo Creek, Yannery River, Harding Dam
Pittosporum moluccanum	4	Dampier Peninsula, N of Broome, Berthier Is., Maret Is., Northern Territory, SE Asia

* Code	Description of Declared Rare and Priority Flora Categories
1	**Priority One - Poorly known Taxa** Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
2	**Priority Two - Poorly Known Taxa** Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
3	**Priority Three - Poorly Known Taxa** Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey.
4	**Priority Four - Rare Taxa** Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

Fauna

Zoogeographically, most of the vertebrate species occurring around the Burrup Peninsula are widely distributed throughout the Pilbara and through much of the Eyrian Subregion. None of the fauna habitats are unique to any single position on the Peninsula but are well represented throughout the area.

These different landforms support a number of different habitat and vegetation assemblages on which fauna depend for survival. Each habitat type provides shelter for varied vertebrate species and can be representative of the fauna groups that occur there.

Previous surveys undertaken on the Burrup Peninsula have recorded a total of 213 vertebrate species (SKM, 2001). This information was compiled from both published reports and unpublished data from CALM (P. Kendrick, unpub. data). The fauna may be classified into two groups, one dependant on land habitats and one dependent on the littoral zone.

The littoral zone fauna consists mainly of birds, particularly waders that are abundant and diverse and feed primarily on the food-rich intertidal flats. The mangroves also support a diverse range of avifauna. Inland, the animals feed mainly on ground-dwelling invertebrate fauna, as shrub and tree communities are restricted in area and provide relatively few food niches.

The vertebrate fauna is subjected to occasional catastrophic events such as cyclones, fire and drought, which cause populations to fluctuate in the short term (Woodside, 1979). These are however natural impacts, to which the animals are adapted.

Mammals

Surveys conducted by both Astron and CALM reveal there are 43 identified species of mammals occurring on the Burrup Peninsula. These consist of 11 marsupials, one monotreme, seven native rodents, 18 bats and five introduced mammals (Butler, 1994, P. Kendrick, unpub. data).

Birds

The largest vertebrate group represented on the Burrup Peninsula is birds, with 127 recorded species. None of these are scarce or endemic. The families which make the greatest contribution to species richness are the Columbidae (Pigeons and Doves), Meliphagidae (Honeyeaters), and Accipitridae (Kites, Goshawks, Eagles and Harriers).

Birds such as at the Australian Kestral, Galah and the Cuckoo shrike are mobile species with large home ranges and possibly use the Site for feeding and resting. Smaller species, including honeyeaters, zebra finches, magpies larks, butcherbirds, crested pigeons are also likely to frequent the area for feeding and resting, but may also use the Site for nesting.

Reptiles

Ninety-four terrestrial reptile species consisting of 17 geckos, seven legless lizards, eight dragon lizards, seven monitor lizards, 26 skinks and 21 land snakes, have been recorded from the Burrup Peninsula. Other groups with fewer species include water snakes, sea snakes, tree frogs, worm snakes and blind snakes. A number of these species are endemic or are species of limited distribution.

Introduced and Pest Species

It is known that six introduced species inhabit the Burrup Peninsula. Five species are introduced mammals (fox, dog, cat, house mouse and black rat) and one species is an introduced insect, the common honey bee (*Apis mellifera*).

Invertebrate Fauna

There has been very little investigation into invertebrate fauna of the area. To date, scientists of the WA Museum, who have made opportunistic collections during other projects, have done most of the work. Land snails have been the most studied invertebrates of the Burrup for two reasons. Firstly because they are regarded as important bio-indicators, as they are effectively stationary so cannot avoid human impacts, and secondly because they leave empty shells which aid in determining species diversity and population size.

The first formal survey of native molluscs was undertaken by the Western Australian Museum of Natural History on the tidal flat extending between King Bay and Hearson Cove in 1999. The study identified eight species of snail, one of which, *Rhagoda sp.*, was known but previously undescribed and is endemic to the Burrup Peninsula (Slack-Smith, 1999). Another species *Quistrachia legendrei* distribution is 'limited' to the mainland area of Dampier and some of the islands of the Dampier Archipelago (Solem, 1997).

Significant Fauna Species

The EPBC search identified 11 threatened species of fauna and 24 migratory species. Additional Migratory species listed under the JAMBA, CAMBA and ROKAMBA conventions have also been recorded within the area. Key species that may be affected by the proposal were the Olive Python (*Liasis olivaceus barroni*) and Northern Quoll (*Dasyurus hallucatus*) given that these two species have been recorded within the Burrup Peninsula and have the potential to utilise habitats within the Site. Migratory bird species were also considered to have the potential to utilise habitats within and surrounding the Site.

A search of the WA DEC Threatened Fauna database was undertaken. A summary of the results from this search is provided in *Table 9* and lists the threatened fauna that was identified as occurring in the vicinity of the Site.

Table 9: Threatened Fauna occurring in the vicinity of the Site.

Species	Name	Last sighted		EPBC Listed
Schedule 1 - Fauna that is rare or is likely to become extinct				
Dasyurus hallucatus	Northern Quoll	1986		Yes
Liasis olivaceus barroni	Pilbara Olive Python	2005	Day Sighting	Yes
Chelonia mydas	Green Turtle	2006	Day Sighting	Yes
Natator depressus	Flatback Turtle	2006	Day Sighting	Yes
Schedule 4 - Other specially protected fauna				
Falco peregrinus	Peregrine Falcon	2006	Day Sighting	No
Priority One: Taxa with few, poorly known populations on threatened lands				
Mormopterus loriae cobourgiana	Little North-western Mastiff Bat	2006	Caught or Trapped	No
Priority Four: Taxa in need of monitoring				
Macroderma gigas	Ghost Bat	2006	Caught or Trapped	No
Pseudomys chapmani	Western Pebble-mound Mouse, Ngadji	1983	Definite signs	No
Ardeotis australis	Australian Bustard	2007	Day Sighting	No
Burhinus grallarius	Bush Stonecurlew	2006	Day Sighting	No
Numenius madagascariensis	Eastern Curlew	2002		No
Phaps histrionica	Flock Bronzewing	1968	Day Sighting	No

The presence of State and Commonwealth listed threatened species will be further clarified as part of a flora and fauna impact assessment to be undertaken as part of the proposal.

3.3 (h) Current state of the environment in the area

Neither the most recent Western Australian nor Commonwealth State of the Environment reports specifically describes the current state of the environment for the proposed TANPF Site detailed in *Section 3.1*. The following general observations have been made:

- The Site is not overly affected by erosion. The majority of the Site consists of a cover of sands, muds and rock.
- The vegetation of the Burrup Peninsula is generally in very good or excellent condition, except in areas of coastal sand. Disturbance from human activity (especially four-wheel-drives) and subsequent invasion by introduced weeds, has altered the vegetation of these coastal sand dunes. (DEC, 2006 – Draft Management Plan).

- Over the years a number of environmental weeds have become established on the Burrup Peninsula, with new introductions continuing to occur. The following list of 13 weed species has been compiled from personal observations (V. Long) and previous surveys conducted on the Burrup (Blackwell et al.,1979), Astron Environmental (1997; 1998; 2000). These have all been determined as weeds by CALM (1999) and their rating is given in *Table 10*.

Table 10: Weeds Known to Occur on the Burrup Peninsula

Species Name	Common Name	Rating
Cenchrus ciliaris	Buffel Grass	High
Aerva javanica	Kapok	High
Cenchrus setigerus	Birdwood Grass	High
Cenchrus enchinatus	Mossman River Grass	Low
Rumex vesciarius	Ruby Dock	High
Stylosanthes hamata	Carribean stylo	Mild
Bidens bipinnata	Bipinnate Beggar-Ticks	Not Determined
Euphorbia hirsuta	Strawberry Weed	Moderate
Passiflora foetida	Wild Passionfruit	High
Solanum nigrum	Nightshade	Moderate
Chloris barbata	Purple-top chloris	Low
Pennisetum setaceum	Fountain grass	Mild
Malvastrum americanum	-	Moderate

Of these weeds, only two species *Aerva javanica* (Kapok) and *Cenchrus ciliaris* (Buffel Grass) were found during the first vegetation survey conducted for the BFPL site immediately to the west of the Site. It is possible that additional weed species may be found within the project lease during the proposed surveys to be undertaken.

The Site likely supports native fauna as described previously (*Sections 3.1(d) and 3.1(e)*). Feral cats, foxes and mice are likely to occur on the Site.

3.3 (i) Other important or unique values of the environment

There are **no** national parks, conservation reserves or wetlands of national significance within or in close proximity to the Site.

3.3 (j) Tenure of the action area (eg freehold, leasehold)

Lots within Burrup Industrial Estate are available for lease to strategic heavy industry through the Department of Industry and Resources (DOIR), which allocate sites through a lease arrangement from LandCorp.

BNPL has been in discussions with government officials, with regards to procuring the Site D. Site D is reserved for BNPL by DoIR and will be allocated to BNPL subject to acceptance of a Coarse Quantitative Risk Assessment (CQRA) currently being undertaken.

3.3 (k) Existing land / marine uses of area

There are currently **no** existing land uses at the Site.

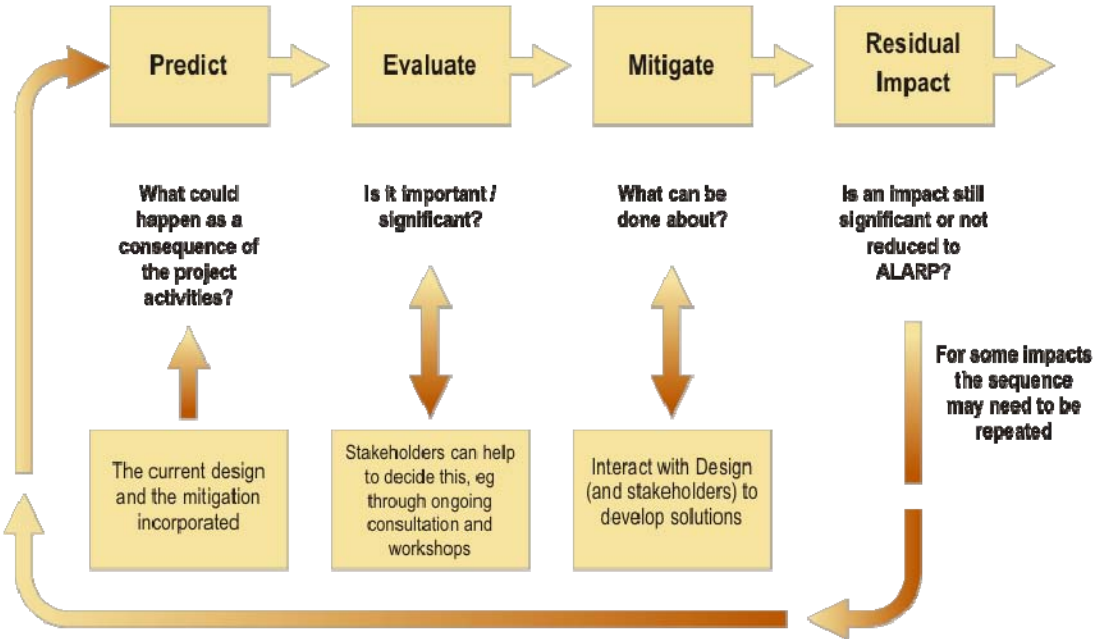
3.3 (l) Any proposed land / marine uses of area

The Site has been zoned 'Strategic Industrial' under the Shire of Roebourne TPS No. 8 and is located within King Bay/Hearson Cove Industrial Precinct of the greater Burrup Industrial Estate (see *Figures 1 and 2*).

4 Measures to avoid or reduce impacts

During the formal EIA process, the impacts of BNPL's project will be predicted and evaluated, and mitigation measures developed. This process is iterative and will inform and run in parallel with the design of the project. The process will also link in with consultation and stakeholder input regarding the significance of impacts and the suitability of the proposed mitigation measures below. This process is illustrated in *Figure 6*.

Figure 6 Prediction, Evaluation and Mitigation of Impacts



Investigations proposed to identify potential environmental issues and to develop specific management measures include, but are not limited to:

- Flora, Vegetation and Fauna studies, including field investigations of the existing environment;
- Noise assessment;
- Air quality assessment, including greenhouse gas management strategy;
- Visual impact and lighting assessment, including a field investigation and ground truthing;
- Stakeholder/community engagement, including a socio-economics study; and
- Acid Sulphate Soil investigation, including a site inspection and soil and groundwater sampling and analysis program.

The following objectives will guide investigations and development of specific management measures in order to minimise the potential risks on the environment associated with BNPL's proposed TANPF.

- BNPL will meet or exceed the minimum standards of operation as determined by either Australian legislation or by internal BNPL requirements.

Flora/Fauna

- BNPL will ensure the extent of vegetation and fauna habitat removal will be minimised to As Low As Reasonably Practicable (ALARP) by ensuring that the layout of plant components and construction laydown area, as determined during the detailed engineering design phase, are such that areas of disturbance are minimised.

- BNPL will ensure impacts on the saline flats that occur in the middle portion of the Site will be minimised where practicable and seasonal flow regimes maintained.

- BNPL will ensure that areas of temporary disturbance will be rehabilitated with appropriate vegetation where practicable.

- BNPL will ensure management of weeds where practicable throughout the Site to avoid any adverse impacts on the local environment.

Atmospheric Emissions

- BNPL will ensure dispersion modelling of gaseous emissions will be undertaken for the TANPF to ascertain ground level concentrations and to provided a basis for developing operational control and monitoring requirements.

- BNPL will ensure a Greenhouse Gas assessment will be undertaken to estimate annual emissions of GHG and the greenhouse intensity of the TANPF.

- BNPL will ensure dust generation from vehicles etc. during construction will be minimised through watering.

- BNPL will reduce atmospheric emissions to ALARP to minimise any impact on the environment.

- BNPL will use all reasonable and practicable measures to minimise the discharge of greenhouse gases from the TANPF, processing and decommissioning operations.

Groundwater and Surface Water Pollution

- BNPL will ensure the TANPF will be designed such that spillages are contained.

- BNPL will ensure installation of appropriate effluent treatment facilities.

- BNPL will ensure that waste water discharged will comply with its operating licence.

- BNPL will ensure treated wastewater will be either discharged into evaporation ponds or returned to the Water Corporation under agreement.

Noise and Vibration

- BNPL will ensure all construction activities will be scheduled at appropriate times to minimise noise disturbance.

- BNPL will ensure all large loads will be moved in accordance with Main Roads traffic regulations;

- BNPL will ensure modelling will be undertaken to predict noise levels. Cumulative noise levels will be estimated incorporating existing and proposed establishments. Relevant mitigation measures will be put in place during detailed engineering to ensure noise levels comply with the relevant legislations and Australian standards.

Liquid and Solid Waste

- BNPL will provide a sustainable option for overall waste management so as not to compromise local and regional environmental, economic and social values;

Landforms

- The TANPF will be designed and located within the Site as to minimise the disturbance to existing land forms. Rehabilitation of the Site will be undertaken following decommissioning of the TANPF.

Pollution (Loading Facility)

- BNPL will implement spill contingency and emergency response plans.

Heritage Sites

- Aboriginal heritage surveys of the Site will be undertaken prior to any land disturbance.
- BNPL will obtain clearance from the local Aboriginal community and the Minister for Aboriginal Affairs if Aboriginal sites must be disturbed.

Community Issues

- BNPL will ensure that activities associated with the TANPF do not adversely impact on the socio-economic or cultural values of the area or of beneficial users.
- BNPL has undertaken preliminary consultation with relevant government departments and decision-making authorities. The consultation process will be ongoing during the preparation of the environmental impact assessment for the project.
- BNPL will maintain open communication and provide full opportunity for stakeholder input and comment at key project stages.

Risks and Hazards

- BNPL has already conducted a preliminary risk assessment of the Site. A CQRA is currently being undertaken and will be submitted to the Department of Consumer and Employment Protection (DoCEP) prior to the allocation of Site D to BNPL by DoIR.
- BNPL will undertake hazard and operability studies, safety reports, fire safety reports and dangerous goods storage and handling accreditation during the detailed engineering design stage of the project.

Visual Amenity

- BNPL will design the TANPF and associated facilities to minimise the visual impact to the surroundings as much as is practicably possible.
- At the time of decommissioning, the TANPF is likely to be removed and the Site rehabilitated and landscaped according to a decommissioning and rehabilitation plan.

The formal EIA process will ultimately result in a list of commitments that BNPL will apply to the project's design, construction, operations and decommissioning. It is anticipated that the final Environmental Management Plans will contain more detailed mitigation measures than those described above.

5 Conclusion on the likelihood of significant impacts

5.1 Do you THINK your proposed action is a controlled action?

X	No, complete section 5.2
	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

Key reasons

The proposed TANPF is **not** a controlled action, as it would not have significant impact on matters of national environmental significance protected under the EPBC Act. BNPL, being the company making this referral believe that the action described in this referral is **not** a controlled action for the following reasons:

- The TANPF will be located in an area already operating chemical and gas production facilities;
- The proposal is not likely to have a significant adverse impact on the environment on Commonwealth land or any matters of National Environmental Significance listed under the EPBC Act;
- The Olive Python and Northern Quoll have previously been recorded within the Burrup Peninsula. After consideration of the species habitat preferences and habitats present within the Site it was considered unlikely that the Site would represent important habitat for either species. Areas of habitat are reserved within the Burrup Peninsula and while 23.7 Ha of sub-optimal habitat may be impacted by the proposal the anticipated impact on the potential habitat of these species is not considered to be significant and therefore warranting formal assessment in accordance with the EPBC Act;
- Habitat for the remaining threatened species identified from the database searches was not considered to be impacted by the proposal on account of no breeding, calving or aggregating areas being present within the Site. In addition, waste water discharge to the existing King Bay outfall is considered unlikely to significantly impact threatened and migratory marine species;
- Seasonal foraging habitat for migratory bird species would be retained to the north and west of the Site and while a small area of this habitat may be impacted by the proposal this was unlikely to represent a significant area of habitat;
- The proposal is not considered likely to have a significant impact on the heritage values of the nearby Dampier Archipelago. To date, no indigenous rock art has been recorded within the Site however heritage issues will be assessed as part of the formal EIA process. In addition it is unlikely that future emissions would adversely impact surrounding areas of rock art;
- Mitigation measures to reduce potential impacts have been provided at *Section 4*. In addition a detailed environmental assessment in accordance with WA state legislation would be conducted to further assess the likely environmental impacts of the proposed development.

Given the above, it is concluded that this project is **not** likely to have a significant impact on any matters of national environmental significance.

5.3 Proposed action IS a controlled action

	Matters likely to be impacted
	sections 12 and 15A (World Heritage)
	sections 15B and 15C (National Heritage places)
	sections 16 and 17B (Wetlands of international importance)
	sections 18 and 18A (Listed threatened species and communities)
	sections 20 and 20A (Listed migratory species)
	sections 21 and 22A (Protection of the environment from nuclear actions)
	sections 23 and 24A (Marine environment)
	sections 26 and 27A (Protection of the environment from actions involving Commonwealth land)
	Section 28 (Protection of the environment from Commonwealth actions)
	Sections 27B and 27C (Commonwealth Heritage places outside the Australian Jurisdiction)

6 Environmental history of the responsible party

		Yes	No
6.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** BNPL as a company has no operating history. BNPL is a joint venture between parent companies Yara International ASA and Burrup Holdings Ltd. Both companies have good records of responsible environmental management. Yara is a world leader in the production of TAN and Europe's leading supplier of TAN for industrial operations. It has three AN plants that have an excellent operating history of responsible environmental management, see *Table 11* below.	X	
6.2	**Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details** BNPL is a newly formed company and has not been subject to legal proceedings under either State or Commonwealth legislation. However, as part of the operation of the adjacent BFPL site, Burrup Holdings have reported environmental non-conformances to the WA DEC and within their internal annual environmental compliance report. Environmental incident reports were submitted to the DEC for each relevant environmental non-conformance associated with the BFPL site. There are no current proceedings.		X
6.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework** The proposed action by BNPL will be undertaken in accordance with the Yara Policy 01: Yara Policy for Health, Environment, Safety, Quality and Product Stewardship, refer *Annex C*. This policy refers to Yara Directives and Technical and Operational standards in force for such operations. This policy is in use throughout Yara and is part of the framework for Yara's successful operation of facilities around the world. It clearly states Yara's and BFPL's commitment for maintaining high environmental, health and safety standards which will be directly applicable for BNPL. A similar policy will be developed in due course, specifically for BNPL.	X	

Table 11: Similar Tan Production Plants

Yara Plant Sites	14001 (Environment)	ISO 9001 (Quality)	ISO 18001 (Working environment)
Rostock (Germany)	Approved	Approved	Approved
Pardies (France)	Approval process ongoing	Approved	Approval process ongoing
Köping (Sweden)	Approved	Approved	Approval process ongoing

6.4 Has the person proposing to take the action previously referred an action under the EPBC Act?

BNPL is a newly formed company that as yet, has not undertaken any projects. BNPL is a joint venture between parent companies Yara International ASA and Burrup Holdings Ltd.

Yara has not previously referred any actions under the EPBC Act. Burrup Holdings has previously referred an action under its operating company BFPL. The referred details are outlined *Table 12*.

×

Table 12: Previously referred Actions

Title of Referral	Burrup Fertilisers Pty Ltd/Industry/Burrup Peninsula/ WA/Ammonia Plant
Date Received	05 Mar 2001
Reference Number	2001/199

7 Information sources and attachments

(For the information provided above)

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7.2 Reliability and date of information

Information referred to in this referral is published by or sourced from reputable organisations and individuals and is based on recent data (mostly less than 10 years old). Database searches were conducted in the last six months while the TANPF description and process information is based on the most recent design and engineering information.

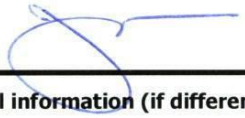
7.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)		
	copies of any flora and fauna investigations and surveys (section 3)		
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)		
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

Project title: Burrup Nitrates Pty. Ltd.

8.1 Person proposing to take action

Name	Wolfgang Jovanovic
Title	Director – Corporate & Company Secretary
Organisation	Burrup Nitrates Pty. Ltd
ACN / ABN (if applicable)	127 391 422
Postal address	Level 8, 225, St. Georges Tce. , Perth, WA 6000
Telephone	+61 (08) 9327 8100
Email	bnpl.referral@bfpl.com.au
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be nominated as the proponent for this action.
Signature	 Date 21 October 2008

8.2 Person preparing the referral information (if different from 8.1)

Name	Megan Lawson
Title	Team Leader – Environment and Planning
Organisation	Environmental Resources Management Australia (ERM)
Postal address	PO Box 7338 Cloisters Square, WA 6850
Telephone	(08) 9321 5200
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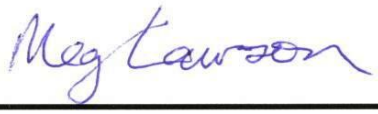
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading.
Signature	 Date 21 October 2008

If the referring party is a small business (fewer than 20 employees), estimate the time, in hours and minutes, to complete this form (include your time reading the instructions, working on the questions and obtaining the information and time spent by all employees in collecting and providing this information).

Hours	Minutes

Glossary

%	Percent
°	Degrees
°C	Degrees Celsius
3Q2008	3rd Quarter 2008
ALARP	As Low As Reasonably Practicable
AHD	Australian Height Datum
Air	Oxygen
ANFO	Porous Ammonium Nitrate plus Fuel Oil
AN	Ammonium Nitrate
Barg	Gauge pressure in Bars
BAT	Best Available Techniques
BFPL	Burrup Fertilisers Pty. Ltd.
BNPL	Burrup Nitrates Pty. Ltd.
CALM	Conservation and Land Management
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon dioxide
CQRA	Coarse Quantitative Risk Assessment
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEC	Department of Environment and Conservation (WA)
DEH	Department of Environment and Heritage (Cwlth)
DEWHA	Department of Environment, Water Heritage and the Arts (Formerly Department of Environment and Water (DEW)) (Cwlth)
DoCEP	Department of Consumer and Employment Protection
DoIR	Department of Industry and Resources
e.g.	For example
EIA	Environmental Impact Assessment
EP Act	*Environmental Protection Act 1986* (WA)
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
GBR	Great Barrier Reef
Ha	Hectares
HSE	Health, safety and environment
HSE-MS	Health, safety and environment management system
i.e.	That is
Kg	Kilogram (s)
kg/day	Kilogram (s) per day
Km	Kilometre(s)
km^2	Kilometre(s) squared
kTPA	Kilo tonnes per annum
LNG	Liquefied Natural Gas
M	Metre(s)
m^2	Metre(s) squared
MAC	Murujuga Aboriginal Corporation
Meq m-2 yr-1	Milliequivalent Metre(s) squared per year
MT	Metric tonnes
MT/h	Metric tonnes per hour
MTPD	Metric tonnes per day
NW	North West
NWSV	North West Shelf Ventures
N	North
N_2O	Nitrous Oxide
NA	Nitric Acid
NES	National Environmental Significance

mg/L	Milligrams per Litre
NH4	Ammonium
No.	Number
Nox	Oxides of Nitrogen
Ppm	Parts per million
PM_{10}	Particulate matter in the air, with an aerodynamic diameter of 10 µm (micrometres) or less.
PO4	Phosphate
TAN	Technical Ammonium Nitrate
TANPF	Technical Ammonium Nitrate Production Facility
TDS	Total Dissolved Solids
TECs	Threatened Ecological Communities
TPS	Town Planning Scheme
TSP	Total Suspended Particulates– all particles below about 50 µm in diameter suspended in the atmosphere.
wt%	Weight Percent
WA	Western Australia