



GUIDELINES FOR PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT STATEMENT

**Marine Harvest
Barramundi Fish Farm
Channel Island, Darwin Harbour NT**

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1 PURPOSE AND LEGISLATIVE REQUIREMENTS

These Guidelines have been developed to assist Marine Harvest in preparing a Draft Environmental Impact Statement (EIS) for the proposed Barramundi Sea Cage Nursery Farm at Channel Island, Darwin Harbour NT in accordance with Clause 8 of the Environmental Assessment Administrative Procedures of the *Environmental Assessment Act (1994)* of the Northern Territory, and under the bilateral agreement with the Australian Government, under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Environmental Assessment Administrative Procedures of the *Environmental Assessment Act (1994)* of the Northern Territory state that the Minister will specify the following in the Guidelines:

- Matters relating to the environment which the proponent shall deal with;
- timeframe for submitting the report;
- number of copies of the report to be provided to minister/other agencies; and
- newspapers in which and on occasions when the proponent will publish a notice.

The controlling provisions under the EPBC Act for the proposed action refer to sections 18 and 18A (listed threatened species and communities) and sections 20 and 20A (listed migratory species).

These guidelines address the environmental issues to be considered in the EIS. If guidance on the structure of the document is required, the proponent should contact the nominated project officer.

The EIS should contain sufficient information to enable understanding and assessment of the scope and environmental implications of the proposal. The EIS should clearly identify the main environmental impacts associated with the development and should contain management strategies to minimise these impacts.

Information should be presented in a concise format, using maps, overlays, tables and diagrams where appropriate to clarify the text.

2 THE PROPOSAL

2.1 Description of Proposal

This section should describe the development proposal to allow a detailed understanding of infrastructure design and engineering and all stages of construction, operation and management of the project and include relevant plans, photos and maps. This section should give consideration to relevant NT Government environmental, construction and environmental health guidelines, standards and codes. Aspects to be covered include:

- The objectives, benefits and justification for the project;

- The location, in a local and regional context, including a scale map of the project location;
- Project schedule, including staging of development and the timing of the stages;
- Layout and infrastructure:
 - Infrastructure requirements and specifications (permanent and temporary) and ancillary activities (eg storage areas and shore bases, boat ramps, road access and water access corridors etc);
 - frequency of boat movements;
 - staffing and servicing requirements, hours of operation and security of the site;
 - power, potable water supply and storage; and
 - the layout of the proposal, including all on shore and on water elements such as processing facility, storage tanks, buildings, roads, pump stations, production facilities, treatment facilities;
- Preferred design criteria for the facility including:
 - Specific location and design criteria for each structure (including, but not limited to components such as sea cages, anchoring systems, storage barges, work platforms, lighting etc.) of the project including design limitations imposed by site characteristics; and
 - ensure that plans fulfil the applicable standards including Environmental Health Standards comprising Public Health, Food and Radiation Protection.
- Process and Operation:
 - Species to be cultured, sources of juveniles/brood stock and farming techniques. Include information on feeding, rearing techniques, hygiene and quarantine requirements, stocking rates, harvesting and all monitoring programs to be undertaken;
 - description of source/s of stock food;
 - description of the processes of production, treatment, discharge, processing, including all inputs and outputs of the process; and
 - ongoing management, maintenance and administrative requirements.
- Lease requirements, land tenure, acquisition requirements (permits, rezoning and Native Title), and the tenures under which the project would be held including details of relevant legislative processes required to grant proposed tenure.
- Safeguards:
 - Identification of chemicals to be stored on site, including quantities;
 - methods for storage, handling, containment and emergency management of chemicals and other hazardous substances (including fuel, diseased stock, morts, bulk feed stores); and

- proposed environmental, safety and emergency management arrangements including risk assessments, contingency and response plans;
- Rehabilitation:
 - Expected life of the project and rehabilitation commitments and timetables (for both temporary and permanent facilities) including waste management, pollution control, storage facilities and rehabilitation of potential mosquito breeding sites.

3 ALTERNATIVES

Alternative designs and locations for the proposed development, that may still allow the objectives of the project to be met, should be discussed, detailing reasons for the selection and rejection of particular options. The short, medium and long-term potential beneficial and adverse impacts of each of the options should be considered.

Alternatives to be discussed should include:

- Not proceeding with the proposal;
- alternative locations/layout for the whole proposal. Discussion of alternative sites should account for the proximity of the proposed site to existing industrial developments and the impacts that might occur to the barramundi farm from these activities, and the susceptibility of the operation to detrimental impacts from the normal operation of other activities or accidental fuel spill from marine vessels and jetties;
- alternative locations/layout for components of the proposal; and
- alternative environmental management techniques.

4 OBJECTIVES AND BENEFITS OF THE PROPOSED PROJECT

This section should detail the primary objectives of the project, the benefits that are expected to result from the proposed development and the project's justification. Issues which could be covered in the section include the overall economic benefits of the proposed project, its likely contribution to the development of the aquaculture industry sector, regional economic development and Indigenous economic development in the Northern Territory, the expected tourism development outcomes, employment and skills development outcomes and linkages with other Territory business sectors, including suppliers, product buyers, waste and by-product users and other service providers.

5 EXISTING ENVIRONMENT, POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT

5.1 Preliminary

Studies to describe the existing environment should be of a scope and standard sufficient to serve as a benchmark against which the impacts of the project may be assessed over an extended period. Control areas not impacted by the project should be included in proposed studies, and long-term monitoring locations should be established.

Detailed information is required on the following for each aspect of the project. Each element should be described and the anticipated and potential impacts of the project considered. The safeguards, management and monitoring strategies that will be used to minimise the impacts of construction and operation of the proposal should be described in adequate detail to allow assessment by reviewers of their likely effectiveness.

5.2 Regional Setting

Describe the project area, in terms of broad climatic zones, catchment terrain types, marine and coastal form and habitat structure, regional population centres, land and water use, land and water sensitivities and Aboriginal relationships to the area including cultural values.

5.3 Physical Environment

Existing Environment

The existing environment should be described to the extent necessary to allow assessment of the extent and duration of impacts. Baseline information is required, and can be attached as an appendix to the report. Relevant maps and figures are to be used where appropriate. Aspects to be addressed include:

- A description of climatic factors including frequency and duration of extreme storms and cyclones, sea level rise;

- a description of existing water quality, including wet season and dry season variability, for both the 3D footprint of the development and surrounding water and watercourses that could potentially be impacted by the development;
- a description of existing hydrology, including tidal influences and levels of tidal fluctuation, and existing water quality of surrounding watercourses;
- a description of bathymetry, tidal conditions and hydrodynamics of the site, and surrounding waters;

Potential Impacts

Potential impacts, both adverse and beneficial should be discussed, including any cumulative impacts. The proponent should draw on their experience over the past five years at Port Hurd and summarise the findings of the environmental performance of the barramundi pilot project at that site, and provide a projection of the potential impacts in the context of the Darwin Harbour proposal.

This section should provide particular detail on:

- The nature and extent of likely short and long term impacts of the proposal;
- the significance of the impacts;
- anticipated impacts as a result of organic loading from stocked cages;
- anticipated impacts as a result of anchoring sites/points;
- potential and anticipated impacts to the physical environment from the use of chemical therapeutants to control parasites and disease in farm stock;
- potential impacts on water quality, including wet season and dry season variability;
- a characterisation of all wastes to water produced by the development;
- discussion on how the project will impact hydrodynamics;
- discussion on how the project will impact archaeological, historical, cultural and Aboriginal sites; and
- risk assessment of the development on the adjacent marine system from sources of waste (including spills).

Proposed Management and Monitoring

- Provide a detailed description of management and monitoring strategies;
- provide a detailed description of any preventative, remediation or rehabilitation measures to minimise the impacts associated with this barramundi farm;
- provide a detailed description of measures to be used to demonstrate the environmental capability for this type of development (the ability of the surrounding environment to sustain such a development and the environmental management expertise of the proponent);
- provide a detailed description of the likely effectiveness of any proposed mitigation measures;

- provide a detailed description of the preferred regime for treatment and disposal of wastes to water (including selection criteria of the regime);
- provide a detailed description of management objectives with respect to impacts on receiving waters such as depletion of dissolved oxygen levels, eutrophication etc. Provide a detailed explanation of any preventative measures;
- provide a detailed description of all monitoring procedures for water quality indicators, and explain maintenance of water quality within the farm;
- provide a detailed description of measures to mitigate impact on archaeological, historical, cultural and Aboriginal sites; and
- provide a detailed description of spill containment and management measures for all potential contaminants used or stored in quantities that could have significant environmental impacts if spilled on land or in the water.

5.4 Biological Environment

Existing Environment

The existing biological environment should be described to the extent necessary to allow assessment of the extent and duration of impacts. Baseline information is required, and can be attached as an appendix to the report. Relevant maps and figures are to be used where appropriate. Aspects to be addressed include:

- a description of existing terrestrial and marine flora and fauna species, communities and habitats present that may be affected by the proposal; and
- the presence of EPBC Act listed migratory species (and/or their habitat) and EPBC Act listed threatened species.

Potential Impacts

Potential impacts (direct and indirect) to the biological environment, both adverse and beneficial should be discussed, including any cumulative impacts. The proponent should draw on their experience over the past five years at Port Hurd and summarise the findings of the environmental performance of the barramundi pilot project at that site.

This section should include detail sufficient for the Australian Government Minister for the Environment and Heritage to make an informed decision whether or not to approve the action under the EPBC Act. This requirement includes the need for enough information about the direct and indirect impacts of the action on listed migratory and listed threatened species and their habitats.

Details should be provided on:

- The nature and extent of likely short and long term impacts of the proposal;
- the significance of the impacts;
- anticipated impacts to terrestrial and marine flora and fauna species, communities and habitats present that may be affected by the proposal. This should include information on:
 - any areas of mangroves or terrestrial vegetation likely to be disturbed;

- potential impacts arising from increased predator activity;
- potential impacts to turtles and dugongs and associated movement, foraging and breeding/calving habitat;
- potential impacts of entanglements;
- potential impacts of harassment devices on marine species;
- potential for fish from adjacent areas to preferentially aggregate at the nursery site; and
- potential for wastes to affect the shoreline (sensitive vegetation, rookeries etc.).
- anticipated impacts as a result of organic loading from stocked cages;
- whether any relevant impacts are likely to be unknown, unpredictable or irreversible;
- anticipated impacts from interaction of wild fish with escaped fish;
- potential and anticipated impacts to the environment, biota and sediments from the use of chemical therapeutants to control parasites and disease in farm stock;
- potential to distort existing biological processes and ecosystems as a result of persistent increased nutrient loads;
- potential and anticipated impacts to wild stock and other fish and marine species of parasites in farm stock;
- the displacement of EPBC Act listed threatened and listed migratory species from the water column due to the presence of the seacages (also the interruption to routes used to access feeding or breeding sites);
- potential for introduction and establishment of Non Indigenous Species (NIS);
- risk assessment of the development on the adjacent marine system from sources of waste (including spills); and
- describe the potential for impact on the receiving environment.

Proposed Management and Monitoring

- Provide a detailed description of management and monitoring strategies to address potential impacts (including mechanisms to monitor and manage impacts on EPBC Act listed migratory and listed threatened species, including their habitat);
- provide a detailed description of any preventative, remediation or rehabilitation measures to minimise the impacts associated with barramundi farming;
- provide a detailed description of measures to address environmental constraints including receiving environment sensitivities and effects on mangroves, seagrasses, corals (and other sensitive habitats) and the need to avoid unacceptable impacts;
- provide a detailed description of measures to be used to demonstrate the environmental capability for this type of development (the ability of the

surrounding environment to sustain such a development and the environmental management expertise of the proponent);

- provide a detailed description of the likely effectiveness of any proposed mitigation measures;
- provide a detailed description of preferred regime for treatment and disposal of wastes to water (including selection criteria of the regime);
- provide a detailed description of biosecurity measures to prevent the onset of disease and build up of high parasite loads within the farm and its spread to or from natural fisheries;
- provide a detailed description of monitoring, management and amelioration of biosecurity threats if any are identified in relation to EPBC Act listed migratory and threatened species; and
- provide a detailed description of biosecurity measures to prevent the establishment of Non Indigenous Species (NIS);

5.5 Air Quality, Noise and Lighting

Existing Environment

- Describe background air quality and noise levels, and sources and intensity of artificial (i.e. non-natural) lighting.

Potential Impacts

- Identify likely noise levels (including from boat movements), timing and duration and comparison to current levels;
- identify the potential for odour generation from operation, storage of products and waste including from potential fish kills;
- identify environmental risks associated with lighting from the facility, such as impacts to wildlife such as turtles;
- if the operation will generate emissions to air (including greenhouse gases), these should be identified and quantified, and a description should be provided indicating techniques to minimise these; and
- Greenhouse gas emissions should be predicted for on-site sources and the upstream supply of energy to the site. The greenhouse gas emission estimates should be calculated using the most recent National Greenhouse Gas Inventory (NGGI) methodology. Alternative methodologies may be used if they can be shown to be more accurate than those used by the NGGI. (Note: this will provide data for assessing the impacts of the farm on the Territory's greenhouse gas emissions. Estimating these emissions using the NGGI methodology is straightforward). There may be minor upstream sources of emissions, such as those associated with producing the food for the stock. Estimates of emissions from these sources need not be provided, because they are unlikely to be significant and are difficult to calculate.

Proposed Management and Monitoring

- Outline any proposed noise management measures;
- outline any proposed odour management measures; and
- outline measures to minimise impacts from lighting.

5.6 Waste Management

- Identify and describe all sources of waste;
- quantify and characterise all waste products;
- detail the potential for accumulation of waste below the cages. This should be done in the context of the hydrodynamic conditions applicable to the site;
- outline waste storage and disposal options. Note that sewage and sullage treatment systems need to comply with the requirements of the *Code of Practice for small on-site sewage and sullage treatment systems and the disposal and reuse of sewage effluent*; and
- provide a waste management plan including reduction, reuse, storage, transport and disposal. Include a certification of acceptance by proposed disposal site of waste products. The transport of waste must not cause a nuisance under the *Public Health Act*. Solid waste should be disposed of at a licensed waste disposal facility complying with the EPA's *Guidelines for the Siting, Design & Management of Solid Waste Disposal Sites in the NT*.

5.7 Transport

- Describe the existing transport infrastructure at locations likely to be impacted. Include water transport infrastructure in the vicinity, such as the jetty at the Liquefied Natural Gas (LNG) facility at Wickham Point. Note: the proponent should contact the Darwin Port Corporation Harbour Master to discuss exclusion zones and safety issues associated with the LNG vessel operation and infrastructure;
- Outline the location, method and routes for transportation of workers, equipment, raw materials and product during construction and operation;
- describe how the project will, or has the potential to, impact transport infrastructure during construction and operational phases. In addition, describe possible transport impacts as a result of the development and the proposed safeguards, management and monitoring strategies that will be implemented to minimise the impacts. Include:
 - methods for complying with any relevant road vehicle axle limits;
 - methods for securing loads;
 - measures to reduce any road traffic noise impacts;
 - consultation with local communities affected by transport impacts;
 - traffic management ; and
 - management of driver fatigue.

- describe the impact of on-water transport on marine species and outline measures to prevent or minimise these impacts.

5.8 Pests and Diseases

- Discuss the impact of existing biting insect populations in the area on the farm work force and measures to minimise the nuisance from biting insects and the health risk from mosquito-borne disease. Information on protection from biting insects can be obtained from the Medical Entomology Branch of the Department of Health and Community Services;
- describe the potential impacts on wild fish and other marine species of parasitism and disease as a result of proximity to intensively stocked fish; and
- outline plans and measures to prevent the onset of disease within the farm and its spread to or from natural fisheries.

5.9 Chemicals and Heavy Metals

- List chemicals and dose to be used in the production process including for disease prevention and treatment; and
- Provide details of manufacturing, storage and quality control of fish food that is proposed for the nursery.

5.10 Social and Recreational

- Discuss the anticipated impacts to fisheries resources in the area, including recreational and commercial;
- discuss the interaction of the farm with recreational users of the region, including recreational fishing, diving (wreck of the Ellengowan) and boating;
- Sacred sites – provide evidence of an Authority Certificate under the *Northern Territory Aboriginal Sacred Sites Act 1989* and compliance with the protection of sites under the *Aboriginal Land Rights (Northern Territory) Act 1976*;
- provide a description of sites of significance including archaeological, historical, cultural, Aboriginal sacred sites, biological and recreational sites; and
- discuss methods of management to prevent or address potential damage to the above sites.

6 PROJECT ENVIRONMENTAL MANAGEMENT

A summary table listing potential impacts, environmental management practices and safeguards, monitoring and management methods, and commitments, cross-referenced to the text of the report should be provided, together with the outline of an Environmental Management Plan (EMP). An EMP should:

- Provide details of proposed measures to minimise adverse impacts and the effectiveness of these safeguards during the construction, commissioning, operational and decommissioning phases of the development;
- ensure that safeguards are being effectively applied;
- enable remedial action for any impacts which are not originally predicted;

- include monitoring methods to determine the differences between predicted and actual impacts, and provide for the periodic review of the management plan itself;
- include an assessment of the expected or predicted effectiveness of mitigation measures employed; and
- include provisions for independent auditing and annual reporting of findings.

6.1 Resourcing and Policies

Information is to be provided on strategic matters relating to environmental management and should include:

- staffing arrangements to ensure that the measures described in the report will be carried out effectively;
- procedures and instructions to employees on minimising unnecessary environmental impacts; and
- a staff induction, training and education program to ensure an informed response to construction and operational environmental concerns.

6.2 Monitoring and Reporting Strategies

Specific programs of monitoring or measuring the success of the Project's environmental management should be outlined. These should be covered in greater detail in the Environmental Management Plan.

7 HEALTH AND SAFETY

Health and Safety issues pertaining to the design, construction and operational phases of the project, and the transport of construction materials, should be investigated. These should address issues concerning employees visiting the site and members of the public:

- Discuss issues relating to provision of emergency first aid treatment and transport of sick or injured persons to the nearest appropriate medical facility; and-
- prepare a management and administration plan outlining strategies and procedures in the event of an emergency.

8 RISK ASSESSMENT AND EMERGENCY MANAGEMENT

8.1 Risk Assessment

While the EIS must deal comprehensively with risks arising on-site, it is suggested that risks to the project from external sources (e.g. oil spills, cyclones, etc.) also be considered. External risks from natural hazards should be determined on the basis of AS/NZS Risk Management Standard 4360:1999.

A review of potential hazards, accidents, during the construction, operational and decommissioning phases should be provided. The likelihood of an event, the possible consequences of the event and safeguards to be implemented to reduce the potential risks should be discussed in quantitative terms where possible.

8.2 Emergency Management

An outline of the proposed emergency management procedures is to be provided and should include for each site:

- contingency plans to deal with disease and mortality of stock during the operation and maintenance of the project;
- contingency plans to account for natural disasters such as storms, floods and fires during the construction, operation, maintenance and decommissioning phases;
- a consultation plan to ensure that development of emergency planning and response procedures integrate effectively and efficiently with regional emergency service providers and are considered adequate and appropriate by these providers; and
- contact details for the relevant Australian Government and Territory agencies in relation to emergency response and medical transport and first aid matters.

9 PUBLIC INVOLVEMENT AND CONSULTATION

Public involvement and the role of government organisations should be clearly identified. The outcomes of surveys, public meetings and liaison with interested groups should be discussed and any resulting changes made to the proposal clearly identified. Details of any ongoing liaison should also be discussed.

Negotiations and discussions with local and community government, the Territory Government and the Australian Government should be detailed and any outcomes referenced. Details of any ongoing negotiations and discussion with government agencies should also be presented.

10 ADMINISTRATION

10.1 Number of Copies

The following should be provided:

- 16 hard copies and 5 CD copies of the EIS to EPA;
- 8 hard copies and 5 CD copies of Appendices (if separate to main document) to EPA;
- 1 electronic ADOBE*.pdf format EIS & Appendices to EPA (please save chapters into separate files for placement on the DNRETA Internet site – large files can be difficult to download);
- 1 unsecured Microsoft Word copy to the EPA to facilitate production of the Assessment Report and Recommendations;
- 3 full hard copies of the EIS to the Australian Government Department of the Environment and Heritage.

In addition, the proponent will be required to distribute copies of the EIS to public viewing locations (e.g. libraries, council offices, etc.). Copies should also be provided to the Northern Land Council and Environment Centre NT/Australian Marine Conservation Society.

The proponent should also consider producing at least several copies for direct sale to the public, on request.

10.2 Advertising

The EIS is to be advertised locally in *The Northern Territory News*, and nationally in *The Australian*.

10.3 Contact Details

The contact officer for the environmental impact assessment for this project is Mr Rod Johnson who may be contacted on telephone number (08) 8924 4002, or email roderick.johnson@nt.gov.au.