Northern Territory Government
Department of Natural Resources, Environment and the Arts

GUIDELINES FOR THE PREPARATION OF A PUBLIC ENVIRONMENTAL REPORT

Waste Treatment Incinerator – East Arm Port

Darwin Port Corporation

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1 Purpose and Legislative Requirements

These Guidelines have been developed to assist the Darwin Port Corporation prepare a Public Environmental Report (PER) for the proposed Waste Treatment Incinerator at East Arm Port in accordance with Clause 8 of the Environmental Assessment Administrative Procedures of the *Environmental Assessment Act (1982)* of the Northern Territory.

Environmental Assessment Administrative Procedures of the *Environmental Assessment Act (1982)* of the Northern Territory state that the Minister will specify the following in the Guidelines:

- Matters relating to the environment as defined in the *Environmental Assessment Act* 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.

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

The PER should contain sufficient information to enable understanding and assessment of the scope and environmental implications of the proposal. The PER should clearly identify the main environmental impacts associated with the development and should contain a management strategy 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

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 facility and include relevant plans, photos and maps. Aspects to be covered include:

- Provide an explanation of the objectives, benefits and justification for the project. The purpose of this is to place the proposal in the local and regional context;
- Project schedule, including staging of development and the timing of the stages;
- Location and design criteria for each component of the project including design limitations imposed by site characteristics;
- Land requirements, land tenure, acquisition requirements (permits, rezoning, Native Title and the protection of sacred sites), and the tenures under which the project would be held including details of relevant legislative processes required to grant proposed tenure;
- Infrastructure requirements and specifications (permanent and temporary) and ancillary activities (e.g. storage areas etc);

- The layout of the proposal, including all elements such as operating facility, storage tanks, buildings, roads etc.;
- Description of the activities carried out on the site, including all possible operational variability;
- Construction timing, methods, equipment and materials (types, sources and quantities) used and shift patterns;
- Ongoing management, maintenance and administrative requirements.

3 ALTERNATIVES

Adequate assessment of the alternative methods of treating the waste stream, and the selection criteria employed, is an important component of this environmental assessment. Alternative proposals, which may still allow the objectives of the project to be met, should be discussed, including detailed reasoning 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:

1. not proceeding with the proposal;
2. alternative systems that would meet the requirements of waste treatment, e.g. higher performance “state of the art” incineration, reduced emissions, closed systems, autoclave, deep burial at a secure site;
3. alternative locations for the whole proposal; and
4. alternative environmental management techniques.

4 EXISTING ENVIRONMENT, POTENTIAL ENVIRONMENTAL IMPACTS AND MANAGEMENT

4.1 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 for each aspect of the project, and the impacts or potential impacts of the project should be considered. The safeguards, management and monitoring strategies that will be used to minimise the impacts of construction and operation of the proposal should be outlined.

4.2 Regional Setting

Describe the project area, in terms of broad climatic zones, land terrain types, regional population centres, land use, land sensitivities and Aboriginal relationships to the land including cultural values.

4.3 Climate

- Present detailed meteorological data for the site and region, particularly factors relevant to the assessment of incinerator emission impacts.
- Potential meteorological influences on dispersion eg inversion layer trapping emissions close to ground.

4.4 Landform

Existing Environment

- Discuss limiting properties of landform considering the effect of settling of reclaimed land on the development infrastructure.

Potential Impacts

- Discuss the potential for soil contamination, particularly due to handling and transport of ash.
- Identify potential construction impacts on landform, particularly in terms of soil erosion and sedimentation. Consideration of impacts on terrestrial and marine flora and fauna.
- Identify the potential construction impacts on Aboriginal sacred sites.
- Demonstrate the land capability for this type of development.

Proposed Management and Monitoring

- Outline erosion and sediment control management of the site.
- Outline measures to address landform limitations including land stability after reclamation.
- Outline relevant monitoring programs.
- Aboriginal sacred sites will be managed and protected under the Authority Certificate process outlined in Section 22 of the *Northern Territory Aboriginal Sacred Sites Act 1989 (NTASSA)*. The proponent must provide proof of an Authority Certificate.

4.5 Water

Existing Environment

- Describe the hydrodynamics of the marine environment adjacent to development area, considering the risk of oil, chemical or fuel spill.
- Describe groundwater and surface water systems at the site.

Potential Impacts

- Detail the water balance for the proposal – the total amount of water used and disposed of during the process. Outline the use of water in the incinerator process (for example, the use of water in any proposed pollution control technique or management of ash) as well as other ancillary uses.
- Provide a characterisation of all wastewater produced by the development.
- Outline proposed disposal of wastewater and describe the potential for impact on the receiving environment.
- Undertake a risk assessment of the development on the adjacent aquatic system from diffuse sources of wastewater and run off (including spills).
- Describe any potential impacts on surface/ground/marine waters from the construction and operation of the proposal as well as diffuse and point source discharges.

Proposed Management and Monitoring

- Detail proposed treatment and disposal of wastewater including preferred options and selection criteria.
- Outline stormwater management techniques.
- Outline measures to prevent diffuse sources of wastewater and contaminants impacting on surface, ground and marine waters.
- Outline spill containment and management measures.

4.6 Noise

- Identify likely noise levels, sensitive receptors, timing and duration and comparison to current levels, and how these are proposed to be managed.

4.7 Air Quality

Existing Environment

- Describe existing background air quality including estimated background levels of the types of air pollutants expected from the facility.
- Identify all nearby sensitive receptors, including other users of the East Arm Wharf and Development Area.

Potential Impacts

- Identify the potential for odour generation from processing, storage of products and waste.
- Discuss the proposal in light of the Stockholm Convention on Persistent Organic Pollutants (to which Australia is a signatory), and with regards to associated draft guidance on Best Available Technology (BAT) and Best Environmental Practice (BET). http://www.pops.int/documents/guidance/beg_guide.pdf; http://www.pops.int/documents/meetings/cop_1/meetingdocs/en/inf_7/INF-7.pdf ;
- Discuss the proposal in light of the European Union Waste Incineration Directive. http://europa.eu.int/comm/environment/wasteinc;

- Discuss the proposal in light of the Draft National Action Plan for Addressing Dioxins in Australia. http://www.ephc.gov.au/news.html#dioxins;
- Give a detailed inventory of waste types from clients and an inventory of the expected air emissions.
- Provide a detailed discussion on the occupational exposure of the workers who will operate the waste treatment incinerator.
- Provide plans, process flow diagrams and descriptions that clearly identify and explain all pollution control equipment and techniques for all processes on the premises.
- Describe all aspects of the air emission control system, including any fugitive emission capture systems (e.g. hooding, ducting), treatment systems (e.g. scrubbers, bag filters) and discharge systems (e.g. stack).
- Outline the operational parameters of all emission sources, including all operational variability; i.e. location, release type (stack, volume or area) and release parameters (e.g. stack height, stack diameter, exhaust velocity, temperature, emission concentration and rate).
- Provide a detailed discussion of potential air quality impacts for all relevant pollutants.
- Undertake Ausplume modelling using the maximum emission limit (indicating worst case scenarios) for each pollutant and the resulting maximum ground level concentration predicted. This will allow for modification to ensure that the design criteria are met and public health therefore protected. At a minimum modelling should be conducted for:
    - Dioxins and furans (as TEQ)
    - PAHs (as BaP)
    - PM_{10}
    - CO
    - NO_2
    - SO_2
    - Heavy metals (as individual species including lead and cadmium)
- Background concentrations for PM_{10}, NO_2 and CO should be included in the modelling. The modelling should be conducted for a range of options for design of the incinerator however if this isn't possible the proposed design needs to reflect current international best practice for incinerators of this type.
- An emission limit should be established for PM_{10} and PAHs (as BaP) based on modelling results.

Proposed Management and Monitoring

- Outline dust suppression and monitoring techniques, particularly during construction.
- Outline pollution control measures for air emission treatment before discharge.
- Outline control measures for fugitive gaseous emissions, leakages.
- The proposed Environmental Management Plan (EMP) for air quality is based on response to complaints. This is not appropriate. The focus needs to be on

avoidance and control of emissions not dealing with a problem once it has occurred. The facility must be run to comply with the emission limits adopted and to ensure that the ground level concentrations do not pose a risk to public health. More detail is required in the site EMP as to how this is to be achieved. Apart from start up, no visible emissions should arise from the stack except for water vapour (white not black or coloured plume). A black or coloured plume would indicate that the combustion process is not working efficiently.

- Information should be provided on proposed air quality monitoring to ensure that there are no off-site impacts that may impact on public health. Monitoring should be conducted for key pollutants (including PM_{10}) with limited sampling conducted for dioxins and furans and PAHs. In-stack monitoring should be conducted regularly for dioxins to ensure that the emission limits are being met. A detailed monitoring schedule should be included in the documentation.

4.8 Greenhouse Management

- Refer to guidelines at Appendix 1.

4.9 Waste Management

- Identify and describe all sources of waste.
- Quantify and characterise all waste products.
- Provide past waste generation levels and calculations for future estimates of waste quantity.
- Provide a breakdown of the type of waste to be incinerated and a list of likely clients.
- Outline waste storage and disposal options.
- Provide a waste management program including reduction, reuse, storage, transport and disposal including certification of acceptance of waste products by the proposed disposal site.
- Identify all sources of waste produced from the incineration process, including wastes resulting from the cleaning and maintenance of pollution control equipment. Outline disposal methods.
- Describe what mechanisms will be put in place to ensure only approved wastes are accepted on site.

4.10 Residue and Ash Handling

- Provide a detailed discussion on the quality and quantity of the ash produced – characterise potential pollutants contained within the ash, particularly any likely or potentially toxic or harmful components.
- Outline methods of handling and disposal of the ash. Include a discussion on the potential impacts and proposed management for these methods.
- Consider impacts on the surrounding terrestrial & marine flora and fauna.

4.11 Transport

- Outline the location, method and routes for transportation of equipment, raw materials and product during construction and operation, including:
    - land transport;
    - sea transport including loading and unloading of ships; and
    - transportation of product and components via pipeline.
- Outline the routes and methods of transport of ash to landfill site.

4.12 Biting Insects

- Discuss biting insect plans with regard to the DHCS publications: *Guidelines for Preventing Biting Insect Problems for Urban Residential Developments or Subdivisions in the Top End of the NT*; *Construction Practice Near Tidal Areas in the NT- Guidelines to Prevent Mosquito Breeding*; and *Personal Protection from Mosquitoes and Biting Midges in the NT*.

5 PROJECT ENVIRONMENTAL MANAGEMENT

Specific safeguards and controls, which would be employed to minimise or remedy environmental impacts, are to be outlined. These are to be covered in detail in the Environmental Management Plans (EMPs).

5.1 Environmental Management System (EMS)

It is recommended that the proponent develops and implements an Environmental Management System (EMS) for the project. The EMS should incorporate all facilities and operations associated with the project to an accepted standard commensurate with the risk of environmental harm. Accepted EMS standards are specified in:

- AS/NZS ISO 14000 – Environmental Management System, Guidelines on Principles;
- AS/NZS ISO 14001 – Environmental Management System, Specifications with guidance for Use; and
- BS 7750 – Specifications for Environmental Management Systems.

5.2 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 and education program to ensure an informed response to construction and operational environmental concerns.

5.3 Environmental Management Plan

All environmental commitments made in the PER should be included and indexed in the Construction and Operational Environmental Management Plans.

5.4 Monitoring and Reporting Strategies

Specific programs of monitoring or measuring the success of the Project's environmental management should be outlined including strategies for incident reporting and complaints management. These should be covered in greater detail in the Environmental Management Plan.

A monitoring strategy should be developed for the construction phase of the project.

6 HEALTH AND SOCIAL IMPACT ASSESSMENT

Health and Safety issues pertaining to the design, construction and operational phases of the project and the transport of construction materials and operational waste should be investigated. Additionally, the health and social impact assessment should:

- Thoroughly investigate potential health and social effects of this proposal on the population of Darwin and surrounds; by:
    - Detailing substances and quantities released during normal, abnormal and ancillary (e.g. transport) operations;
    - Giving consideration to increases in air, water and land pollution (including odours, dusts, possible food contamination, biological/disease hazards, noise);
    - Estimating the dispersal of pollution;
    - Identifying routes of exposure, e.g. the food chain;
    - Estimating the contribution of background pollutants, e.g. bushfire smoke;
    - Identifying the population that will be exposed to pollutants and their quantified total exposure;
    - Identifying the particularly vulnerable populations; and
    - Considering direct exposure (inhalation) and indirect exposure via pathways such as food ingestion.
- address health and safety issues concerning employees of and visitors to the site;
- 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.

7 RISK AND EMERGENCY MANAGEMENT

7.1 Risk Management

The PER must deal comprehensively with on site risks, it is suggested that external risks to the project also be considered. External risks from natural hazards should be determined on the basis of AS/NZS Risk Management Standard 4360:1999, combined with periodic evaluation of control effectiveness taking into account monitoring data and evolving best practice.

A review of potential hazards including risks to security 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.

7.2 Emergency Management

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

- Identification of chemicals to be stored on site, including quantities and locations;
- Methods for storage, handling, containment and emergency management of chemicals and other hazardous substances (including fuel);
- Proposed environmental, safety and emergency management arrangements including risk assessments, contingency and response plans;
- contingency plans to deal with hydrocarbon spills during construction, operation and maintenance of the project;
- contingency plans to account for natural disasters such as storms, floods and fires during the construction, operation and maintenance phases;
- ensure that development of emergency planning and response procedures are determined in consultation with regional emergency service providers;
- include the relevant Commonwealth and Territory agencies in relation to emergency medical response and transport and first aid matters; and
- include the relevant hazardous goods licences and legislation.

8 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 Commonwealth Government should be detailed and any outcomes referenced. Details of any ongoing negotiations and discussion with government agencies should also be presented.

9 ADMINISTRATION

9.1 Number of Copies

20 hard copies, 5 CD copies, 2 ADOBE*.pdf format and 1 unsecured word copy of the PER should be provided to the Office of Environment and Heritage (to allow placement on the Office's Internet site, for distribution to NT advisory bodies and to facilitate production of the Assessment Report and Recommendations).

Approximately 10 bound copies of the PER will be required for placement at public viewing locations (eg. libraries, council offices, etc.).

The proponent is to provide copies of the PER to the following organisations:-

- Darwin City Council
- Environment Centre Northern Territory
- Palmerston City Council
- Darwin Harbour Advisory Committee

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

9.2 Advertising

The PER is to be advertised in *The Northern Territory News.*

9.3 Contact Details

The contact officer for this project is Mr Matthew Kinch who may be contacted on telephone number (08) 8924 4020, or email matthew.kinch@nt.gov.au.

APPENDIX 1

NT Environmental Impact Assessment Guide
Greenhouse Gas Emissions

1. PURPOSE

The Northern Territory Government's objective for managing greenhouse gas emissions from new and expanding operations is to minimise emissions to a level that is as low as practicable.

This Guide aims to assist proponents in providing the information needed by the Office of Environment and Heritage (OEH) to assess the impact of greenhouse gas emissions from proposed projects during assessment under the *Northern Territory Environmental Assessment Act 1994*.

2. THE GUIDANCE

2.1 Emissions estimates

Proponents should detail the following in their environmental impact assessment documentation:

a) an estimate of the **greenhouse gas** emissions for the construction and operation phases:

- in **absolute** and **carbon dioxide equivalent** figures (refer to the Glossary in this Guide) for each year of the project; and
- identified on a gas by gas basis and by **source** (including on site and upstream sources such as emissions arising from land clearing and the production and supply of energy to the site).

Emissions estimates are to be calculated using the methodology developed and periodically updated by the ***National Greenhouse Gas Inventory Committee***[1] *or another national or internationally agreed methodology.*

b) details of the **project lifecycle greenhouse gas emissions** and the greenhouse gas efficiency of the proposed project (per unit and/or other agreed performance indicators).

Lifecycle emissions and greenhouse gas efficiency should be compared with similar technologies producing similar products.

[1] Up to date methodology can be obtained from the Australian Greenhouse Office. See www.greeenhouse.gov.au.

To provide an understanding of the broader impact of the proposal, proponents are encouraged to place the estimated greenhouse gas emissions from the proposal into a national and global context[2].

2.2 Measures to minimise greenhouse gas emissions

Proponents must demonstrate consideration of a wide range of options and indicate the intended measures and efficient technologies to be adopted to minimise total greenhouse gas emissions from the proposed project, including:

(a) identifying energy conservation measures, opportunities for improving energy efficiency and ways to reduce fugitive emissions where applicable;

(b) indicating where potential savings in greenhouse gas emissions can be made through the use of renewable energy sources, taking into account fossil fuels used for supplementary power generation; and

(c) their commitment to offsetting greenhouse gas emissions.

*The design measures to maximise efficiency and minimise emissions should represent **best practice** at the time of seeking project approval.*

Proponents are to advise whether they will join the **Commonwealth Government's Greenhouse Challenge** program.

Emission offsets include activities that remove carbon from the atmosphere or reduce the greenhouse gas intensity (output per unit product) from current or future activities. Examples may include but are not limited to:

- establishment and maintenance of perennial vegetation;
- **sequestration** of carbon by geological, chemical, biological or other means;
- reducing the carbon intensity of existing activities;
- replacing fossil fuels with renewable fuels;
- trading emissions permits in a nationally approved system;
- synergistic linking of enterprises to reduce net greenhouse gas outputs; and
- development of new greenhouse gas efficient technologies.

Proposed emissions offsets projects should include an estimate of greenhouse gas emissions savings that are likely to be achieved through implementation.

Measures that offset emissions within the NT are encouraged, and OEH staff can discuss possible options with proponents.

2.3 Emissions monitoring and reporting

Consistent with the principles of continuous improvement, a program is to be outlined in the proponent's Environmental Management Plan which includes ongoing monitoring, investigation, review and reporting of greenhouse gas emissions and **abatement** measures. It should be noted that in 2006, large energy users (those using

[2] Information on Australia's national emissions profile can be obtained from the Australian Greenhouse Office at www.greenhouse.gov.au; international emissions from the United Nations Framework Convention on Climate Change (UNFCCC) webite at http://unfccc.int/2860.php/ .

greater than 0.5 petajoules per year) will be required by the Commonwealth Government to report publicly on their greenhouse gas emissions.

2.4 Preparedness for climate change

Proponents should demonstrate due consideration of the risk of climate change

impacts to the proposal. Relevant variables may include, but are not limited to:

- increasing average temperature and evaporation rates;
- variation in rainfall and the incidence of floods;
- sea level rise;
- increased frequency and intensity of cyclones and storm surge levels; and
- altered distribution of pests and disease.

In assessing climate change risk, proponents should be guided by recent projections published by organisations such as the CSIRO and Intergovernmental Panel on Climate Change (For CSIRO projections, see: http://www.ipe.nt.gov.au/whatwedo/greenhouse/documents/pdf/ntclimatechange.pdf .

3. GLOSSARY OF TERMS

Abatement: Limiting, abating, avoiding or sequestering greenhouse gas emissions through source reduction, fuel displacement or switching, carbon stabilising techniques or **sink** enhancement.

Absolute emissions: Refers to the total emissions of greenhouse gases expressed in terms of the actual mass of each individual gas emitted over a specified time period.

Best Practice: A best practice is a process, technique, or use of technology, equipment or resource that has a proven record of success in minimising energy use and greenhouse gas emissions. A commitment to use best practice is a commitment to use all available knowledge and technology to ensure that greenhouse gas emissions are minimised.

Carbon Dioxide Equivalent: A unit of greenhouse gas emissions calculated by multiplying the actual mass of emissions by the appropriate **Global Warming Potential**. This enables emissions of different gases to be added together and compared with carbon dioxide (see Table 1 below).

Commonwealth Government's Greenhouse Challenge program: A cooperative effort by industry and the Commonwealth Government to reduce greenhouse gas emissions through voluntary industry action. See: www.greenhouse.gov.au/challenge.

Greenhouse Gases: Table 1 lists the greenhouse gases proponents are required to report on.

Global Warming Potential (GWP): The warming potential of a gas, compared to that for carbon dioxide. GWPs are revised from time to time as knowledge increases about the influences of different gases and processes on climate change. Refer Table 1.

Project Lifecycle Greenhouse Gas Emissions: Those greenhouse gas emissions measured cumulatively over a defined period. Typically this period is from the point of extraction of the raw materials to either the beginning of the consumer phase of a

product or the final disposal or recycling stage of a product, depending on its nature. Proponents should justify their choice of the defined period.

National Greenhouse Gas Inventory Committee: A committee comprising representatives of the Commonwealth, State and Territory Governments that oversees the development of greenhouse gas inventory methods and compilation of inventories for Australia.

Sequestration: Removal of greenhouse gases from the atmosphere by vegetation or technological measures. Sequestration is not yet precisely defined for the purposes of recognised trading or offset schemes. Accordingly, OEH will take a common sense approach on a case by case basis in the interim. To assist proponents, OEH regards sequestration as a process that results in the isolation of carbon dioxide from the atmosphere for a period which is significant in terms of influencing the global warming effect.

Source: Any process or activity that releases a greenhouse gas into the atmosphere.

Table 1: Greenhouse gases and respective Global Warming Potentials (GWPs)[3]

Greenhouse Gas	Global Warming Potential
Carbon dioxide (CO_2)	**1**
Methane (CH_4)	**21**
Nitrous oxide (N_2O)	**310**
Perfluorocarbons (CF_x)	**6500 - 8700**
Hydrofluorocarbons (HFCs)	**560 – 11 700**
Sulphur hexafluoride (SF_6)	**23 900**

Greenhouse gas emissions expressed in carbon dioxide equivalent (CO_2-e) are calculated by multiplying the actual mass of emissions for each greenhouse gas by its respective GWP factor.

[3] GWP factors listed are those published by the International Panel on Climate Change at the time of publication of this Guide.