Netherlands Commission for Environmental Assessment

Generic review framework for oil terminals

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0. Review Framework: Introduction

Rijkswaterstaat Noordzee (the North Sea unit of the implementing agency of the Dutch Ministry of Infrastructure and the Environment) is the competent authority for licensing decisions under the Maritime Management (BES) Act.[1] Acting in that capacity, Rijkswaterstaat Noordzee will review the quality of the environmental impact assessment (EIA) for the proposed expansion of the NuStar oil terminal on Sint Eustatius. Relevant information from the EIA will be used in its decisions on licensing and/or planning decisions. Rijkswaterstaat has asked the Netherlands Commission for Environmental Assessment[2] to assist with this review.

The Commission has drawn up a generic review framework for this purpose. Given the short time available to produce a report, and the existing budgetary limitations, it has not been possible to produce a tailor made report which takes the local situation and the specific design fully into consideration,[3] nor has the Commission visited the proposed site for the expansion. The Commission's advisory process has not included the following elements: consultation with the island administration, NuStar and other stakeholders, and analysis of obligations under international treaties and local environmental legislation on Sint Eustatius. The Commission recommends that these elements be properly addressed in other frameworks.

The generic review framework set out in this report can be used to review information in the EIA for the entire terminal, both onshore and offshore. It is based on the Review Checklist in the EU Guidance on EIA[4] and the Commission's experience of oil storage terminals in EIA procedures in the Netherlands. For information purposes on the proposed project, the Commission has received a Memorandum for the Environmental Impact Assessment NuStar Terminal Expansion'[5] (subsequently referred to as 'the Memorandum'). In this report the Commission also considers the situation on Sint Eustatius, insofar as it is able to gauge this, and the Memorandum.

In the ensuing seven chapters the Commission discusses the proposed generic review framework based on the seven sections in the EU Review Checklist.

Lastly, in Chapter 8, the Commission lists the essential review points for the EIA, i.e. the points that, in its opinion, an EIA for an oil terminal must address if environmental considerations are to be taken fully into account in decision-making.

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1 BES stands for Bonaire, Sint Eustatius and Saba.

2 For technical information on the EIA procedure, the Commission's role, the composition of the working group and the documents used in the review, see Appendix 1 and www.commissiemer.nl.

3 In this situation the Commission's usual approach is to draw up a tailor-made report on the content of the EIA.

4 EU publication Guidance on EIA, June 2001. A copy of the Checklist is provided in Appendix 2.

5 Royal Haskoning, 22 July 2011.

1. Description of the Project (section 1)

1.1 Proposed project[6]

The Review Checklist contains a detailed questionnaire on the project description. In this chapter we flesh this out for oil terminals based on Dutch EIA practice.

Generally speaking, it is important that the proposed project be described in an EIA, insofar as it has effects on the environment. It is advisable to distinguish between activities in the implementation phase (design/construction) and the operational phase (operation and management), as the respective environmental effects are very different and can occur in different places and at different times. Separate phases in implementation are also important to be taken into consideration.

The situation on Sint Eustatius
The Commission would like to draw particular attention to Review Questions 1.12 and 1.13 in the Checklist, which are concerned with existing and planned activities/developments in the project area that could cease or change as a result of the project, or in combination with which it could have cumulative effects. Consider, for example, use of the coastal area by the local population, recreation, fisheries, the airport safety zone and the relationship with the existing NuStar terminal.

1.1.1 Design

Generally speaking, the technical design of an oil terminal determines the environmental effects to a substantial extent, both under conditions of normal operation (emissions to air, soil and water) and in the event of accidents and disasters. The environment within which the terminal is located may complicate the design task, for example if there are valuable natural assets or other spatial considerations that need to be incorporated into the design.

In the Netherlands, the construction of tanks therefore needs to comply with various Dutch and European standards. Dutch guideline PGS-29 (Publication Series on Dangerous Substances) has been drawn up jointly by the industry and the licensing authorities as a design and review framework for above-ground tanks. Chapters 4-8 of PGS-29 set out the Dutch and European standards in a clearly organised manner and discuss design and licensing requirements in detail (e.g. detection systems, lightning conduction, maintenance system and fire safety).

The situation on Sint Eustatius
The Memorandum indicates that all the new tanks need to be capable of holding K1, K2 and K3 fuels.[7] K1 fuels, being the most critical,[8] will be an important criterion for the design. The

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[6] The headings in the Checklist are 'The Objectives and Physical Characteristics of the Project', 'The Size of the Project', and 'Production Processes and Resources Used'.

[7] This classification is based on the hazards associated with these fuels (K1 being the most hazardous).

Memorandum refers to American code API 650 as the design standard; other standards (API) are not mentioned. The Commission has reviewed whether the proposed designs in the Memorandum also comply with Best Available Techniques (BAT)[9] and found that this is the case: for example, vapour return systems are included on all new tanks and the loading, unloading and transshipment facilities (e.g. the Jetty).

The Memorandum appears to indicate that relatively little space is available to install tanks at the preferred site, and the tanks appear to be sited on several levels and close to the ocean. If this is indeed the case, the task of designing adequate secondary containment capacity will be a complex one. Containment capacity is needed to prevent a minor accident – e.g. a local leak – from escalating into one embracing the entire terminal. Adequate capacity is also important to prevent pollution of the soil, groundwater and the ocean in the event of one or more tanks failing. In Dutch EIAs, tank dikes around the tanks or double-walled tanks (which are safer and space-saving but often more expensive) are the most common solutions.

The existing and future safety systems for the 'wet' facilities, e.g. to prevent leaks, are not clear to the Commission at present. The design of these systems, pipeline networks etc. depends on a large number of factors, for example:

- the vapour return systems mentioned above;
- the frequency of inward and outward fuel movements;
- how leaks of K1, K2 and K3 products are contained and disposed of;
- in what way(s) storage and transshipment is carried out via the 'wet' facilities (e.g. direct pumping of fuels from large tankers to smaller tankers and/or via the storage tanks in the terminal).

Measures to prevent leaks are therefore particularly important.

The water management system at the terminal may also be an issue, e.g. rainwater discharge. Given its lack of knowledge of the local situation, the Commission is unable to gauge this.

1.1.2 Shipping

In general terms, information on shipping movements to and from the terminal and the increase in these movements is needed if the effects of the oil terminal expansion on the environment and the safety situation are to be assessed.

In a Dutch EIA, this is usually shown for the final leg of the shipping route; the remainder of shipping movements and the associated environmental and safety effects are considered in other frameworks. Moored and docked vessels (emissions) are considered as part of the installation in the Netherlands.

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[8] This is due to the fact that K1 substances have the lowest flashpoint and thus ignite most readily.

[9] As listed in the European BREF, Reference Document on Best Available Techniques on Emissions from Storage, pursuant to the European IPPC Directive.

The situation on Sint Eustatius
The Memorandum indicates that information will be provided on changes in the traffic situation. Adequate information on expected shipping movements to and past the island, berths and moored and docked vessels is important, serving as input to other environmental aspects in the review framework.

1.2 Emissions[10]

An EIA for an oil terminal must include information on the type of fuel products being stored and transshipped, to enable the emissions and hence the environmental effects to be gauged properly.

In the Netherlands, an EIA therefore discusses the following aspects of fuel products:
- annual throughput;
- bandwidth of the composition;
- expected destination;
- a worst-case scenario, e.g. with maximum annual throughput.

The situation on Sint Eustatius
It is important for the EIA to provide information on the maximum quantities of products expected/to be accepted by NuStar and the most likely levels of toxic and odoriferous substances that they could contain (in particular volatile organic hydrocarbons, sulphur compounds, benzene, MTBE[11] and mercury). It is important, then, to set out how it will be ensured that products with higher than the accepted levels of these substances are not taken into storage or transshipped.

Chapter 4, Environmental Effects (section 4), considers the emissions and the associated environmental effects in more detail.

1.3 Accidents and disasters[12]

Safety is one of the most important topics in an EIA for an oil terminal. The safety risks and consequences for the surrounding area of accidents and disasters are often analysed in a 'risk analysis'. Issues here are:
- the results of safety analyses for the terminal and how they are incorporated in measures at the terminal: examples of ways of determining this are the LOPA method,[13] Barrier analysis[14] and the 'Bow-Tie' method,[15] which involves taking the requirements of IEC 61511 into consideration[16];

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[10] This is the Residues and Emissions heading in the Checklist.

[11] MTBE stands for methyl tertiary butyl ether, which is added to fuels to improve their 'anti-knock' properties, i.e. the extent to which the fuel in a fuel-air mixture can be compressed (with the associated temperature rise) without self-igniting.

[12] This is the Risks of Accidents and Hazards heading in the Checklist.

[13] Layer of Protection Analysis.

[14] Barrier analysis is a technique used particularly in the process industry. It is a source-based approach based on tracing energy flows, with a focus on barriers to those flows, to identify how and why the barriers do not prevent the energy flows from causing harm.

- potential domino effects, e.g. fire spreading from one tank to another, from one tank group to another, or from storage to tankers and vice versa;
- what lessons have been learned from the Buncefield disaster in Hemel Hempstead in Great Britain (see also PGS-29, mentioned above).

In the Netherlands, a risk analysis is usually provided as an appendix to the EIA and its main findings are incorporated in the EIA and the description of the proposed project (the design).

The situation on Sint Eustatius
The Memorandum states that a QRA is to be carried out. In the Commission's opinion it will be important here to examine the risk of a major oil leak on land, from land to sea and off-shore, in various accident and disaster scenarios. It is essential to provide an overview of this in the EIA and the QRA, linked with an account of how the design and running of the existing and new terminal are geared to the accident and disaster scenarios.

The Commission does not know how disaster management (e.g. disaster management plans, fire-fighting and clean-up capacity) is organised onshore and offshore on the island and in the region or what authority is responsible for this. Examples of issues that need to be considered in the EIA and the QRA are the measures to deal with disaster management capacity (which may be limited) and unusual weather conditions (e.g. hurricanes) and the possible presence of substantial numbers of people, e.g. as a result of cruise ships occasionally or regularly passing by or berthing there.

2. Alternatives (section 2)

The following review points emerge from the Review Checklist:
- a search for and selection of realistic alternatives;
- the 'zero alternative';
- the environmental rationale for considering/not considering alternatives;
- the comparison of alternatives.

Generally speaking, the selection of realistic alternatives depends on the decisions that need to be taken (e.g. strategic or more specific policy or planning decisions). The relationships and interdependencies between various options (as regards siting and technology) also need to be considered.

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[15] Bow-Tie is a qualitative risk analysis method that can provide a systematic picture of the risks in an organisation and the preventive and remedial measures that can be used to deal with them. It is an event-related tool based on identifying scenarios.

[16] IEC 61511 is a standard designed specifically for the process industry. Among other things it requires a prior process safety and risk analysis, so that risk reduction requirements for the instrumental safety systems can be laid down.

The situation on Sint Eustatius
Translating this into the situation on Sint Eustatius, the nature of the decisions that need to be taken is unclear at present. Relatively specific licensing decisions will certainly be involved. The relationships and interdependencies between the options are important here: for example, options regarding the offshore part of the installation, e.g. the Jetty (competent authority: Rijkswaterstaat Noordzee), could affect decisions on onshore siting options (competent authority: the Island Council) as well as the licensing aspects (competent authority: the Island Council and/or in due course the Minister of Infrastructure and the Environment) and vice versa.

Another obvious criterion is that siting and technical alternatives must reasonably be within the reach and capacity of NuStar. The Commission therefore bases the review framework for siting alternatives below on NuStar's proposal in the Memorandum (§2.5), and additionally on Dutch and European practice as regards technical alternatives.

2.1 Siting alternatives

Generally speaking, the site determines the environmental effects of an oil terminal to a substantial extent, as the environmental effects of building the terminal – visibility, emissions and accidents and disasters – will probably be less if there are few or no sensitive assets in the area (nature, housing, landscape, archaeological remains, etc.). Also, different sites often have very different environmental effects. The comparison of these effects in an EIA provides the environmental information needed to weigh up site options and state the rationale.

In the Netherlands, siting alternatives are usually bounded by national, regional or local government visions and plans, for which strategic environmental assessments (SEA) have taken place. Also, sites have often been examined in advance and compared on environmental effects by the companies wishing to build oil terminals, with the result that there is little freedom as regards alternative sites in EIAs for the licensing of oil storage terminals.

The situation on Sint Eustatius
As far as the Commission is aware, no published research has been carried out yet on Sint Eustatius into where the best sites, if any, for the expansion of the oil terminal are located from an environmental point of view.

The Memorandum discusses siting in §2.5.1, and lists various alternative sites for the terminal and the Jetty which are to be examined in the EIA. It also states that, based on previous research, Schotsenhoek is the preferred site. The Venus Bay and Bergje sites were considered but rejected as alternatives, and Memorandum indicates that the EIA will give the rationale behind this. Given its lack of knowledge of the local situation, the Commission is unable to gauge the extent to which these sites could be regarded as valid alternatives that are worth exploring in this EIA.

An important point when examining siting alternatives is the scope of the EIA. Do the alternative sites in the EIA serve merely to support the Schotsenhoek site, or is the final choice of site still open, and does it depend (in part or entirely) on the environmental information in the EIA? The Memorandum does not make this clear. A similar question could be asked regarding the siting of the Jetty. The answers to these questions will determine the level of

detail required from the environmental information on alternatives (similar detail level as the preferred option or more general detail level). This question will have to be answered by the authorities concerned and by NuStar.

For the EIA, alternative sites with environmental advantages could be compared on the basis of:

- visibility from Oranjestad and other prominent places on the island: the current terminal is almost entirely hidden from view by a ridge, whereas the nearer Schotsenhoek site would be clearly visible;
- the distance from residential areas, nearer or further away (nuisance, health effects and safety);
- the distance from the Jetty and moored vessels to the present port and the feasibility or otherwise of using the port and coastal area by the population and for recreation and fisheries;
- design options for the terminal, e.g. combining activities or not, space for safety facilities;
- the effect of the proposed expansion on the airport safety zone;
- the effect on cultural heritage (including archaeological remains);
- the effect on natural assets (e.g. bird nesting sites).

2.2 Technical alternatives

As noted in Chapter 1, the technical design of an oil terminal determines the environmental effects to a substantial extent, both under conditions of normal operation (emissions to air, soil and water) and in the event of calamities and disasters. As a result, an overview of technical alternatives is important in the EIA, to show differences in environmental effects between alternatives and to indicate whether more environmentally friendly options exist. An overview should provide the environmental information for technical choices and rationale.

In the Netherlands, technical alternatives are based on environmental (emissions, safety), legislation (standards) and state of the art within the sector concerned. They can be divided into the following categories:

- site layout: siting and number of tanks, pipelines, wharves, Jetty, etc.;
- tank design (floating, roof, fixed roof, etc.): see also the BREF Best Available Techniques on Emissions from Storage;
- measures to reduce vapour emissions, both from storage tanks and from vessels being loaded (e.g. vapour return systems on tanks and transshipment facilities, minimising tank roof landing[17]);
- vapour processing: thermal/catalytic combustion, active carbon adsorption, membrane filtration, absorption, condensation, as regards emissions from both storage tanks and vessels being loaded;
- measures to prevent or reduce emissions into the soil and groundwater in the event of accidents and calamities;

[17] Roof landing is the height difference between the floor of a storage tank and its roof in a 'floating roof' tank that has been pumped dry. When the tank is filled it is in this space that fuel vapour is created which is eventually discharged into the air. The lower the roof landing, and the less often it is needed, the lower the ultimate emissions to air.

- safety measures (see also e.g. PGS-29);
- use of onshore power to reduce emissions from moored vessels;
- waste water and rainwater treatment.

Dutch practice is to seek a balance between a 'zero-emission' terminal and adequate safety by examining alternatives and variants (some measures to reduce emissions to air result in higher safety risks, for example).

Lastly, there are also technical variants for the construction of storage tanks and associated facilities, for example:
- foundation type and method;
- pile-driving in land or water, as well as the often more environmentally friendly options such as vibration, drilling or screwing.

The situation on Sint Eustatius
The Memorandum discusses technical alternatives in §2.5.2. In view of practice in the Netherlands and Europe (and for that matter many places in the USA) it would make sense to describe a 'zero-emission' terminal. Emissions into soil and water could be minimised by means of leak detection, containment capacity and liquid-resistant facilities. The vapour return systems proposed by NuStar for the storage tanks and storage and transshipment facilities, if combined with well-designed containment capacity and liquid-resistant facilities, could come close to achieving a 'zero-emission' terminal. This would present an alternative that minimises emissions to soil, water and air (any odour nuisance, air pollution and atmospheric deposition).

The Commission would also like to more explicitly address technical alternatives more likely to prevent major emissions into the soil and groundwater in the event of accidents and disasters (see also the advice on secondary containment capacity in Chapter 1 of this report). Such as an alternative in which smart technical design ensures that oil could never escape into the ocean, but would be diverted into a containment basin. If this is not set out in the EIA, it will be unclear to what extent the terminal could have been made safer in this regard.

The Memorandum does not set out any technical alternatives for the construction of the terminal. In addition to the type of foundation and technical alternatives to pile-driving (also offshore along the coast) as mentioned above, there may be other alternatives that are more environmentally friendly (produce less nuisance); this includes, for example, the works needed (excavation, blasting, etc.) for making the mountainous terrain suitable for the erection of tanks. Given its lack of knowledge of the local situation, the Commission is unable to gauge this.

3. Description of the Environment as a Baseline (section 3)

3.1 Environmental characteristics[18]

The EU Review Checklist provides a comprehensive, clearly organised reference for examining the baseline situation.

Generally speaking, it is important for an EIA to also describe the situation that would exist if the project is not realised, so that this situation can be compared with the proposed project and the environmental differences identified. In a Dutch EIA, the baseline situation is a description of the future situation if the proposed project is not realised, including plans and activities which have already been decided upon but not yet carried out. Scenarios are often used, for example in case it is uncertain at present whether plans and activities that are expected to have an influence on the proposed project will actually go ahead.

The situation on Sint Eustatius

The Memorandum is vague on this point, so the Commission cannot analyse what role the environmental characteristics could have in the EIA. Lack of knowledge of the local situation also makes it difficult to gauge this. Here, then, are a number of general issues that should be considered when describing the baseline:

- an overview of current and future shipping traffic, showing clearly what is linked to NuStar and including information on passenger vessels (e.g. cruise ships) and the current use of the port;
- climate and meteorology: this could be important when gauging the spread of air pollution (prevailing wind direction) and accident and disaster scenarios (e.g. hurricanes);
- a baseline survey of soil quality and the coastal area, including coral reefs along the coast (freedom from 'oil products'): this could be important to the construction work and leak detection systems. If any soil or water pollution is found, for NuStar and the environment it needs to be clearly demonstrated whether the leakage has come from NuStar or is to some other cause in the past;
- biodiversity: the Netherlands Commission for Environmental Assessment often has an approximate idea, based on nature surveys, of what current natural assets exist and where, and how scarce and unique they are. An overview of this kind might be required here, e.g. a description of the occurrence and distribution of endemic[19] fauna in the project area and of concentrations of important habitats and sub-populations (including coral reefs, colonies of sea birds) and functions (sea turtle nesting beaches);
- cultural history: the Commission understands that there are remains of old buildings and archaeological remains on the Schotsenhoek site;
- are there other activities on the island that are important from a safety point of view (high-risk plants or installations, sensitive premises or objects)?

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[18] This is the 'Aspects of the Environment' heading in the Checklist.

[19] 'Endemics' are species that only occur in a limited area such as an island or archipelago. The smaller the area, the more vulnerable endemics are to extinction.

3.2 Citing of sources and research methods[20]

The Review Checklist discusses the description and citing of sources and methods in some detail.

In the Netherlands, there are often standards that are accepted in the industry or calculation rules laid down by the authorities. Often there is also information on the environmental baseline situation which is freely accessible and of good quality.

The situation on Sint Eustatius
In the case of Sint Eustatius, the Commission is unable to gauge the extent to which adequate information is available on the baseline situation. Review Question 3.21 (freely translated: dealing with uncertainties) is likely to be important here.

4. Environmental Effects (section 4)

4.1 Selection of environmental effects[21] and predicted environmental effects[22]

The Review Checklist discusses in detail the description of environmental effects that is required (see also Emissions in section 1 of the Checklist).

The selection of the environmental effects to be examined in an EIA can be focused in various ways, depending on the purpose of the selection. For example:

- to identify the differing environmental effects of alternatives;
- to assess the feasibility or otherwise of alternatives;
- to determine the need for mitigating measures;
- communication: e.g. specific research based on concerns among residents and users of a particular area about an environmental effect;
- requirements under laws and regulations or international treaties.

The level of detail required in the description of the environmental effects may also differ depending on the purpose(s) of the selection: for example, a more general level of detail may suffice when comparing highly differing alternatives than for a detailed analysis of the effects on a rare or unique species.

In the Netherlands, 'scoping' (identification of the environmental effects to be analysed further in the EIA) for an initiative of this kind is straight forward, as the detailed sector-specific laws and regulations lay down requirements that serve as a guide. The information on environmental effects is often already available and is appended to the EIA (just to be on the safe side). Hence the Scoping heading in the Checklist, and justifying the choices made in this respect, plays a relatively minor role in EIAs for oil terminals in the Netherlands.

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[20] This is the Data Collection and Survey Methods heading in the Checklist.
[21] This is the Scoping of Effects heading in the Checklist.
[22] These are the various Prediction of ... Effects headings in the Checklist.

The situation on Sint Eustatius
The Memorandum mentions a large number of potential environmental effects but does not select which ones to describe and does not discuss the proposed method for the assessment of each environmental aspect in detail. The Commission therefore assumes, for the time being, that all the environmental effects mentioned in the Memorandum will be described, i.e. no prior selection has been or will be made.

Below, the Commission considers the Checklist as regards particular issues concerning the prediction of effects and the associated environmental consequences for the NuStar terminal. The points below should not be regarded as the Commission's selection or prioritisation of environmental effects to be described in the EIA. Given the limited information available, the Commission is not in a position to rank prediction of effects in the Memorandum in relation to other environmental aspects (e.g. quality of life).

4.2 Issues regarding effect prediction for the NuStar terminal

4.2.1 Wastes and residues

In the Netherlands, the handling of wastes and residues is strictly regulated. The Commission does not know how this is organised on Sint Eustatius. To avoid undesirable situations, the Commission recommends a check on what wastes and residues can be expected during the construction and operating phase (soil, rock, oil residues, etc.), how they are to be processed and where they are to be disposed of (see also the Review Checklist), so as to avoid future environmental problems.

4.2.2 Biodiversity

To identify the differing effects of alternatives and the need, if any, for mitigating measures, information is needed on the natural assets on and around the island. The Memorandum endorses this.

Generally speaking, then, it would make sense in the Commission's opinion for the EIA to provide information on the effects on:

- species unique to the island or the region, known as 'endemics'[19] (flora and fauna);
- coral reefs and other vulnerable marine ecosystems: the emphasis will probably be on the construction phase, e.g. the building of the Jetty and other marine structures. The relationship with shipping routes and disaster scenarios may also be important;
- 'essential assets', such as breeding sites of unusual species, endangered habitats etc., colonies (e.g. beaches for sea turtles and breeding sites for sea birds);
- marine communities in the event of accidents (leaks) or disasters, showing both the short and long-term effects.

Lack of insight into the local situation makes it difficult for the Commission to gauge this aspect.

The environmental effects can be determined by comparing the effect on local, regional or international populations in relation to the total habitat, thus showing the relative importance

of the populations in the project area. International treaties (e.g. the Bonn Convention) provide guidelines on this.

4.2.3 Safety and risks to the environment

In the Netherlands, when and how risks to humans must be determined is laid down in the *Besluit externe veiligheid inrichtingen* (BEVI, External Safety of Installations Decree). This enables the authorities to decide for themselves whether the statutory risk standards have been complied with and to set their own acceptable risk levels for accidents involving large numbers of victims.

Risks to soil, water and nature, for instance, are estimated based on accident and disaster scenarios. The risk of accidents and disasters is often relatively low as a result of technical and design choices.

The Memorandum states that a QRA will be carried out for the EIA (see also §1.3 of this report). In the Commission's opinion it is important that the QRA and/or EIA should include the consequences (i.e. the environmental effects) of accidents and disasters onshore and offshore, as well as a quantitative analysis of the risk of such accidents and disasters.

The quantitative analysis could, for example, be based on the CCPS Guidelines for Chemical Process Quantitative Risk Analysis or similar standards. This, combined with the accident and disaster scenarios described, could provide a basis for determining the possible effects on the environment (humans, habitat, soil, water and nature). A point that should be considered in this analysis is risks to local residents, and to vessels not linked with the terminal (e.g. passenger vessels) in the port and on shipping routes near Sint Eustatius.

4.3 Assessing environmental effects and knowledge gaps[23]

As a rule, environmental effects are assessed by reviewing them in the light of standards or project objectives. A review in the light of international treaties, e.g. regarding biodiversity, may also be involved. Knowledge gaps are dealt with in an EIA in various ways, for example by means of worst-case scenarios, fall-back measures or by applying the precautionary principle (if in doubt, don't).

The situation on Sint Eustatius
The Memorandum does not address the assessment of environmental effects. What environmental effects are acceptable and how knowledge gaps should be 'weighted' will have to be assessed by the authorities concerned and by NuStar. It would make sense to take obligations under international treaties and local environmental laws and regulations into account here. Worst-case scenarios, fall-back measures or application of the precautionary principle would seem to be suitable ways of dealing with knowledge gaps.

[23] These are the 'Evaluation of the Significance of Effects' and 'Impact Assessment Methods' headings.

5. Mitigating Measures (section 5)

In general terms, mitigation can be defined as taking steps to avoid or reduce negative effects of a decision or act.

In Dutch EIA practice, mitigating measures and alternatives are often intertwined. Possible environmental consequences will often have been considered prior to projects; mitigation is therefore already incorporated in the design. Also, some mitigating measures are a basic obligation under certain laws and regulations.

The situation on Sint Eustatius
Table 5.2 of the Memorandum shows a broad package of mitigating measures that should be considered. Generally speaking, in the Commission's opinion it would make sense for the EIA to link effect prediction, assessment of environmental effects and mitigating measures. If there are major knowledge gaps as regards environmental effects, maximum use of mitigating measures could be a strategy.

If the offshore construction work is short-lived, given the nature of the project (oil terminal) the Commission does not at present envisage any obvious areas that need to be monitored.[24] The results of the EIA should give more insight into this. The Memorandum states that the results of the EIA will be translated into an environmental management plan.

6. Summary (section 6)

The summary is the part of the EIA most read by decision-makers and stakeholders, so it merits special attention. It should be readable as a self-contained document and properly reflect the content of the EIA.

The Review Checklist deals with this area in sufficient detail.

7. Quality of Presentation (section 7)

Generally speaking, an EIA should include:
- maps at the correct scale, showing topographical names and scales;
- appendices for the sake of readability: e.g. the underlying research reports should be included separately, not as part of the main report;
- separate sections on essentials and non-essentials.

The Review Checklist deals with this area in sufficient detail.

[24] N.B. Matters such as leak detection and the operation and adjustment of certain systems at the terminal fall under the heading of normal operations, not monitoring.

8. Review points

In the ensuing sections, the Commission indicates what areas should be focused upon when reviewing an EIA for an oil terminal. If these aspects of the review are satisfactory, environmental considerations can be taken fully into account in decision-making.

8.1 Sections 1 and 2 (Proposed Project and Alternatives)

8.1.1 Design standard

The Commission regards PGS-29 as a good standard for a review framework for an EIA for an oil terminal. If it is decided not to use PGS-29 or a similar standard in the EIA, it is important in the Commission's opinion that clear reasons be given for this decision, so that it is clear why it is acceptable to disregard the standards and approach in PGS-29 or similar standards.

A less stringent standard is the European Reference Document on Best Available Techniques on Emissions from Storage. The techniques in this BREF could be used as a review framework, based on the consideration that the proposed design must at least comprise Best Available Techniques (BAT) that are the minimum standard in the European Union (and in many cases elsewhere).

8.1.2 Description of a worst-case scenario for the fuels to be processed

In the Commission's opinion, a worst-case scenario, with a maximum annual throughput of the various types of fuel for example, is an essential element in an EIA for an oil terminal. If it is decided not to include this, it is important for the EIA to make it clear in some other way what the maximum environmental consequences of major changes in the throughput of fuels would be.

8.1.3 Alternatives

A clear account of the alternatives that have and have not been considered ('alternative selection') is important. Objectives of the authorities and private-sector operators concerned regarding safety, spatial development, landscape and nature may have a substantial effect on alternative selection.

Point regarding Sint Eustatius
The Commission has no insight into the above objectives; if information on them is available then the Commission recommends that it be included in the review. It should then be assessed whether the alternatives adequately meet these objectives.

Siting alternatives

As regards the alternatives set out, the Commission recommends that it be assessed whether siting alternatives with major environmental advantages have been dropped previously, and if so, whether good reasons have been put forward for this. A clear overview of the environmental differences between sites, and the conditions in which the various sites would be possible/realistic, is essential.

Technical alternatives

Zero-emission terminal

The review criterion is whether adequate consideration has been given to a 'zero-emission terminal', divided into the various environmental components (soil, water and air), including minimising emissions at storage and transshipment points (e.g. the Jetty).

Secondary containment capacity

The Commission considers that it is essential to review the design of the secondary containment capacity in the event of accidents and disasters in terms of the criteria of 'adequate size' and 'adaptation to the local situation'. The accident and disaster scenarios, including the domino effect scenarios set out, can be used to examine these two criteria (see §8.2 below).

8.2 Sections 3, 4 and 5 (Accidents and Disasters)

Chapters 9-11 of Dutch guideline PGS-29 (Publication Series on Dangerous Substances) set out safety measures, fire prevention and running and management. The Commission regards this as a good standard for a review framework. If it is decided not to use PGS-29 or a similar standard, it is important in the Commission's opinion that clear reasons be given why it is acceptable in that situation to disregard the standards and approach in PGS-29 or similar standards.

It is important for the EIA or QRA to:

- set out the safety regulations and state whether an analysis of how these are implemented in measures at the terminal (onshore and offshore) is available;
- include a quantitative analysis of the safety risks onshore and offshore;
- include an analysis of potential accident and disaster scenarios (e.g. domino effect);
- set out the current onshore and offshore disaster management plans, how collaboration between the organisations involved is organised, and what guarantees there are that the plans will be put into practice;
- state whether there is a clear overview of who is responsible for what.

If the above points are not included in an EIA or QRA or available elsewhere, it is important that it be argued convincingly why they can be omitted in this situation or that this information will become available in due course.

Point regarding Sint Eustatius

Check specifically whether NuStar's and the authorities' current onshore and offshore disaster management plans have been set out, and how collaboration between NuStar and the authorities on the island and in the region is organised.

8.3 Sections 3, 4 and 5 (Miscellaneous)

8.3.1 Selection of environmental effects and predicted environmental effects

Check in general terms whether for each relevant environmental aspect in sections 3 and 4:

- there is an analysis of the expected environmental effects;
- the major contributions (worst-case scenario) have been identified;
- it has been argued convincingly that these are the major contributions;
- the major contributions have been adequately examined;
- major knowledge gaps have been set out.

A consideration here is that the environmental effects will differ substantially between the construction and operating phase and/or between normal operating and accident and disaster situations, and these should therefore be described separately.

Point regarding Sint Eustatius

The Commission recommends that the effects also be reviewed in the light of obligations under international treaties and local laws and regulations. The Commission is not familiar with these, however.

8.3.2 Mitigating measures

Check whether the EIA includes a clear overview of possible mitigating measures. Does the overview follow on logically from the predictions of environmental effects? Is it clear to the authorities concerned whether these are suggestions or recommendations or whether the mitigating measures are part and parcel of the proposed project?

8.4 Sections 6 and 7 (Summary and Presentation)

Check whether there is a summary that can be read as a self-contained document, including at least:

- a layman-friendly description of the proposal;
- an overview of the alternatives set out;
- a comparison of the alternatives as regards the main environmental effects;
- clear maps.

Point regarding Sint Eustatius

For the NuStar project it would make sense to provide Dutch and English versions of the EIA summary.

Appendix 1: Project data

Proponent: NuStar

Competent Authority EIA-procedure:
Rijkswaterstaat Noordzee, possibly island administration and Minister of Infrastructure and Environment

Decision:
Permitting Maritime management Act (BES), other unknown

Composition of the working group:
For each project the Commission composes a working group. For this project the members are:
prof. dr. Ben Ale
ir. Henk Buijtenhek
drs. Sjoerd Harkema (technical secretary)
drs. Jan van der Winden

Used documents:
The Commission used the following documents in this advisory procedure:

- 'Memorandum for the Environmental Impact Assessment NuStar Terminal Expansion', Royal Haskoning, 22 July 2011.

Appendix 2: The Review Checklist

The Review Checklist

SECTION 1 DESCRIPTION OF THE PROJECT				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
The Objectives and Physical Characteristics of the Project				
1.1	Are the need for and objectives of the project explained?			
1.2	Is the programme for implementation of the Project described, detailing the estimated length of time and start and Finnish dates for construction, operation and decommissioning? (this should include any phases of different activity within the main phases of the Project, for example extraction phases for mining operations)			
1.3	Are all the main components of the project described (for assistance see the Checklist of Project Activities in Part C of the Scoping Guide in this series)			
1.4	Is the location of each Project component identified, using maps, plans and diagrams as necessary?			
1.5	Is the layout of the site (or sites) occupied by the project described? (including ground levels, buildings, other physical structures, underground works, coastal works, storage facilities, water features, planting, access corridors, boundaries)			
1.6	For linear projects, are the route corridor, the vertical and horizontal alignment and any tunnelling and earthworks described?			
1.7	Are the activities involved in construction of the project all described?			
1.8	Are the activities involved in operation of the project all described?			
1.9	Are the activities involved in decommissioning the project all described? (e.g. closure, dismantling, demolition, clearance, site restoration, site re-use etc)			
1.10	Are any additional services required for the project all described? (e.g. transport access, water, sewerage, waste disposal, electricity, telecoms) or developments (e.g. roads, harbours, powerlines, pipelines)			
1.11	Are any developments likely to occur as a consequence of the Project identified? (e.g. new housing, roads, water or sewerage infrastructure, aggregate extraction)			
1.12	Are any existing activities which will alter or cease as a consequence of the Project identified?			
1.13	Are any other existing or planned developments with which the Project could have cumulative effects identified?			
The Size of the Project				
1.14	Is the area of land occupied by each of the permanent project components quantified and shown on a scaled map? (including any associated access arrangements, landscaping and ancillary facilities)			
1.15	Is the area of land required temporarily for construction quantified and mapped?			

SECTION 1 DESCRIPTION OF THE PROJECT				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
1.16	Is the reinstatement and after use of land occupied temporarily for operation of the Project described? (e.g. land used for mining or quarrying)			
1.17	Is the size of any structures or other works developed as part of the Project identified? (e.g. the floor area and height of buildings, the size of excavations, the area or height of planting, the height of structures such as embankments, bridges of chimneys, the flow or depth of water)			
1.18	Is the form and appearance of any structures or other works developed as part of the Project described? (e.g. the type, finish and colour of materials, the architectural design of buildings and structures, plant species, ground surfaces, etc)			
1.19	For urban or similar development projects, are the numbers and other characteristics of new populations or business communities described?			
1.20	For projects involving the displacement of people or businesses, are the numbers and other characteristics of those displaced described?			
1.21	For new transport infrastructure or projects generating substantial traffic flows, is the type, volume, temporal pattern and geographical distribution of new traffic generated or diverted as a consequence of the Project described?			
Production Processes and Resources Used				
1.22	Are all the processes involved in operating the Project described? (e.g. manufacturing or engineering processes, primary raw material production, agricultural or forestry production methods, extraction processes)			
1,23	Are the types and quantities of outputs produced by the Project described? (these could be primary or manufactured products, goods such as power or water or services such as homes, transport, retailing, recreation, education, municipal services (water, waste, etc))			
1.24	Are the types and quantities of raw materials and energy needed for construction and operation discussed?			
1.25	Are the environmental implications of the sourcing of raw materials discussed?			
1.26	Is efficiency in use of energy and raw materials discussed?			
1.27	Are any hazardous materials used, stored, handled or produced by the Project identified and quantified? • during construction • during operation • during decommissioning			

SECTION 1 DESCRIPTION OF THE PROJECT				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
1.28	Are the transport of raw materials to the Project and the number of traffic movements involved discussed? (including road, rail and sea transport) • during construction • during operation • during decommissioning			
1.29	Is employment created or lost as a result of the Project discussed? • during construction • during operation • during decommissioning			
1.30	Are the access arrangements and the number of traffic movements involved in bringing workers and visitors to the Project estimated? • during construction • during operation • during decommissioning			
1.32	Is the housing and provision of services for any temporary or permanent employees for the Project discussed? (relevant for Projects requiring migration of a substantial new workforce into the area for either construction or the long term)			
Residues and Emissions				
1.33	Are the types and quantities of solid waste generated by the Project identified? (including construction or demolition wastes, surplus spoil, process wastes, by-products, surplus or reject products, hazardous wastes, household or commercial wastes, agricultural or forestry wastes, site clean-up wastes, mining wastes, decommissioning wastes) • during construction • during operation • during decommissioning			
1.34	Are the composition and toxicity or other hazards of all solid wastes produced by the Project discussed?			
1.35	Are the methods for collecting, storing, treating, transporting and finally disposing of these solid wastes described?			
1.36	Are the locations for final disposal of all solid wastes discussed?			
1.37	Are the types and quantities of liquid effluents generated by the Project identified? (including site drainage and run-off, process wastes, cooling water, treated effluents, sewage) • during construction • during operation • during decommissioning			
1.38	Are the composition and toxicity or other hazards of all liquid effluents produced by the Project discussed?			
1.39	Are the methods for collecting, storing, treating, transporting and finally disposing of these liquid effluents described?			

SECTION 1 DESCRIPTION OF THE PROJECT				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
1.40	Are the locations for final disposal of all liquid effluents discussed?			
1.41	Are the types and quantities of gaseous and particulate emissions generated by the Project identified? (including process emissions, fugitive emissions, emissions from combustion of fossil fuels in stationary and mobile plant, emissions from traffic, dust from materials handling, odours) • during construction • during operation • during decommissioning			
1.42	Are the composition and toxicity or other hazards of all emissions to air produce by the Project discussed?			
1.43	Are the methods for collecting, treating and finally discharging these emissions to air described?			
1.44	Are the locations for discharge of all emissions to air identified and the characteristics of the discharges identified? (e.g. height of stack, velocity and temperature of release)			
1.45	Is the potential for resource recovery from wastes and residues discussed? (including re-use, recycling or energy recovery from solid waste and liquid effluents)			
1.46	Are any sources of noise, heat, light or electromagnetic radiation from the Project identified and quantified? (including equipment, processes, construction works, traffic, lighting, etc)			
1.47	Are the methods for estimating the quantities and composition of all residues and emissions identified and any difficulties discussed?			
1.48	Is the uncertainty attached to estimates of residues and emissions discussed?			
Risks of Accidents and Hazards				
1.49	Are any risks associated with the Project discussed? • risks from handling of hazardous materials • risks from spills fire, explosion • risks of traffic accidents • risks from breakdown or failure of processes or facilities • risks from exposure of the Project to natural disasters (earthquake, flood, landslip, etc)			
1.50	Are measures to prevent and respond to accidents and abnormal events described? (preventive measures, training, contingency plans, emergency plans, etc)			
Other Questions on Description of the Project				

SECTION 2 CONSIDERATION OF ALTERNATIVES				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
2.1	Is the process by which the Project was developed described and are alternatives considered during this process described? (for assistance, see the guidance on types of alternatives which may be relevant in Part B3 of the Scoping Guide in this series)			
2.2	Is the baseline situation in the No Project situation described?			
2.3	Are the alternatives realistic and genuine alternatives to the Project?			
2.4	Are the main reasons for choice of the proposed Project explained, including any environmental reasons for the choice?			
2.5	Are the main environmental effects of the alternatives compared with those of the proposed Project?			
Other Questions on Consideration of Alternatives				

SECTION 3 DESCRIPTION OF ENVIRONMENT LIKELY TO BE AFFECTED BY THE PROJECT

No.	Review Question	Relevant?	Adequately Addressed?	What further information is needed?
Aspects of the Environment				
3.1	Are the existing land uses of the land to be occupied by the Project and the surrounding area described and are any people living on or using the land identified? (including residential, commercial, industrial, agricultural, recreational and amenity land uses and any buildings, structures or other property)			
3.2	Are the topography, geology and soils of the land to be occupied by the Project and the surrounding area described?			
3.3	Are any significant features of the topography or geology of the area described and are the conditions and use of soils described? (including soil quality stability and erosion, agricultural use and agricultural land quality)			
3.4	Are the fauna and flora and habitats of the land to be occupied by the Project and the surrounding area described and illustrated on appropriate maps?			
3.5	Are species populations and characteristics of habitats that may be affected by the Project described and are any designated or protected species or areas defined?			
3.6	Is the water environment of the area described? (including running and static surface waters, groundwaters, estuaries, coastal wasters and the sea and including run off and drainage. NB not relevant if water environment will not be affected by the Project)			
3.7	Are the hydrology, water quality and use of any water resources that may be affected by the Project described? (including use for water supply, fisheries, angling, bathing, amenity, navigation, effluent disposal)			
3.8	Are local climatic and meteorological conditions and existing air quality in the area described? (NB not relevant if the atmospheric environment will not be affected by the project)			
3.9	Is the existing noise climate described? (NB not relevant if acoustic environment will not be affected by the Project)			
3.10	Is the existing situation regarding light, heat and electromagnetic radiation described? (NB not relevant if these characteristics of the environment will not be affected by the Project)			
3.11	Are any material assets in the area that may be affected by the Project described? (including buildings, other structures, mineral resources, water resources)			
3.12	Are any locations or features of archaeological, historic, architectural or other community or cultural importance in the area that may be bisected the Project described, including any designated or protected sites?			
3.13	Is the landscape or townscape of the area that may be affected by the Project described, including any designated or protected landscapes and any important views or viewpoints?			

SECTION 3 DESCRIPTION OF ENVIRONMENT LIKELY TO BE AFFECTED BY THE PROJECT				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
3.14	Are demographic, social and socio-economic conditions (e.g. employment) in the area described?			
3.15	Are any future changes in any of the above aspects of the environment, that may occur in the absence of the project, described? (the so-called Moving Baseline or No Project situation)			
Data Collection and Survey Methods				
3.16	Has the study area been defined widely enough to include all the area likely to be significantly affected by the Project?			
3.17	Have all relevant national and local agencies been contacted to collect information on the baseline environment?			
3.18	Have sources of data and information on the existing environment been adequately referenced?			
3.19	Where surveys have been undertaken as part of the Environmental Studies to characterise the baseline environment are the methods used, any difficulties encountered and any uncertainties in the data described?			
3.20	Were the methods used appropriate for the purpose?			
3.21	Are any important gaps in the data on the existing environment identified and the means used to deal with these gaps during the assessment explained?			
3.22	If surveys would be required to adequately characterise the baseline environment but they have not been practicable for any reason, are the reasons explained and proposals set out for the surveys to be undertaken at a later stage?			
Other Questions on the Description of the Environment				

SECTION 4 DESCRIPTION OF THE LIKELY SIGNFICANT EFFECTS OF THE PROJECT				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
Scoping of Effects				
4.1	Is the process by which the scope of the Environmental Studies was defined described? (for assistance, see the Scoping Guide in this series)			
4.2	Is it evident that a systematic approach to scoping was adopted?			
4.3	Is it evident that full consultation was carried out during scoping?			
4.4	Are the comments and views of consultees presented?			
Prediction of Direct Effects				
4.5	Are direct, primary effects on land uses, people and property described and where appropriate quantified?			
4.6	Are direct, primary effects on geological features and characteristics of soils described and where appropriate quantified?			
4.7	Are direct, primary effects on fauna and flora and habitats described and where appropriate quantified?			
4.8	Are direct, primary effects on the hydrology and water quality of water features described and where appropriate quantified?			
4.9	Are direct, primary effects on uses of the water environment described and where appropriate quantified?			
4.10	Are direct, primary effects on air quality and climatic conditions described and where appropriate quantified?			
4.11	Are direct, primary effects on the acoustic environment (noise or vibration) described and where appropriate quantified?			
4.12	Are direct, primary effects on heat, light or electromagnetic radiation described and where appropriate quantified?			
4.13	Are direct, primary effects on material assets and depletion of non-renewable natural resources (e.g. fossil fuels, minerals) described?			
4.14	Are direct, primary effects on locations or features of cultural importance described?			
4.15	Are direct, primary effects on the quality of the landscape and on views and viewpoints described and where appropriate illustrated?			
4.16	Are direct, primary effects on demography, social and socio-economic condition in the area described and where appropriate quantified?			
Prediction of Secondary, Temporary, Short Term, Permanent, Long Term, Accidental, Indirect, Cumulative Effects				

SECTION 4 DESCRIPTION OF THE LIKELY SIGNFICANT EFFECTS OF THE PROJECT				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
4.17	Are secondary effects on any of the above aspects of the environment caused by primary effects on other aspects described and where appropriate quantified? (e.g. effects on fauna, flora or habitats caused by soil, air or water pollution or noise; effects on uses of water caused by changes in hydrology or water quality; effects on archaeological remains caused by desiccation of soils)			
4.18	Are temporary, short term effects caused during construction or during time limited phases of project operation or decommissioning described?			
4.19	Are permanent effects on the environment caused by construction, operation or decommissioning of the Project described?			
4.20	Are long term effects on the environment caused over the lifetime of Project operations or caused by build up of pollutants in the environment described?			
4.21	Are effects which could result from accidents, abnormal events or exposure of the Project to natural or man-made disasters described and where appropriate quantified?			
4.22	Are effects on the environment caused by activities ancillary to the main project described? (ancillary activities are part of the project but usually take place distant from the main Project location e.g. construction of access routes and infrastructure, traffic movements, sourcing of aggregates or other raw materials, generation and supply of power, disposal of effluents or wastes			
4.23	Are indirect effects on the environment caused by consequential development described? (consequential development is other projects, not part of the main Project, stimulated to take place by implementation of the Project e.g. to provide new goods or services needed for the Project, to house new populations or businesses stimulated by the Project)			
4.24	Are cumulative effects on the environment off the Project together with other existing or planned developments in the locality described? (different future scenarios including a worst case scenario should be described). For further guidance on assessment of cumulative impacts see *http://europa.eu.int/comm/ environment/eia/eia-support*			
4.25	Are the geographic extent, duration, frequency, reversibility and probability of occurrence of each effect identified as appropriate?			
Prediction of Effects on Human Health and Sustainable Development Issues				
4.26	Are primary and secondary effects on human health and welfare described and where appropriate quantified? (e.g. health effects caused by release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the project, changes in living conditions, effects on vulnerable groups)			
4.27	Are impacts on issues such as biodiversity, global climate change and sustainable development discussed where appropriate?			
Evaluation of the Significance of Effects				

SECTION 4 DESCRIPTION OF THE LIKELY SIGNFICANT EFFECTS OF THE PROJECT				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
4.28	Is the significance or importance of each predicted effect discussed in terms of its compliance with legal requirement and the number, importance and sensitivity of people, resources or other receptors affected?			
4.29	Where effects are evaluated against legal standards or requirements are appropriate local, national or international standards used and relevant guidance followed?			
4.30	Are positive effects on the environment described as well as negative effects?			
4.31	Is the significance of each effect clearly explained?			
Impact Assessment Methods				
4.32	Are methods used to predict effects described and are the reasons for their choice, any difficulties encountered and uncertainties in the results discussed?			
4.33	Where there is uncertainty about the precise details of the Project and its impact on the environment are worst case predictions described?			
4.34	Where there have been difficulties in compiling the data needed to predict or evaluate effects are these difficulties acknowledged and their implications for the results discussed?			
4.35	Is the basis for evaluating the significance or importance of impacts clearly described?			
4.36	Are impacts described on the basis that all proposed mitigation has been implemented i.e. are residual impacts described?			
4.37	Is the level of treatment of each effect appropriate to its importance for the development consent decision? Does the discussion focus on the key issues and avoid irrelevant or unnecessary information?			
4.38	Is appropriate emphasis given to the most severe, adverse effects of the Project with lesser emphasis given to less significant effects			
Other Questions relevant to Description of Effects				

SECTION 5 DESCRIPTION OF MITIGATION				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
5.1	Where there are significant adverse effects on any aspect of the environment is the potential for mitigation of these effects discussed?			
5.2	Are any measures which the developer proposes to implement to mitigate effects clearly described and their effect on the magnitude and significance of impacts clearly explained?			
5.3	If the effect of mitigation measures on the magnitude and significance of impacts is uncertain is this explained?			
5.4	Is it clear whether the Developer has made a binding commitment to implement the proposed mitigation or that the mitigation measures are just suggestions or recommendations?			
5.5	Are the Developer's reasons for choosing the proposed mitigation explained?			
5.6	Are responsibilities for implementation of mitigation including funding clearly defined?			
5.7	Where mitigation of significant adverse effects is not practicable or the developer has chosen not to propose any mitigation are the reasons for this clearly explained?			
5.8	Is it evident that the EIA Team and the Developer have considered the full range of possible approaches to mitigation including measures to reduce or avoid impacts by alternative strategies or locations, changes to the project design and layout, changes to methods and processes, "end of pipe" treatment, changes to implementation plans and management practices, measures to repair or remedy impacts and measures to compensate impacts?			
5.9	Are arrangements proposed to monitor and manage residual impacts?			
5.10	Are any negative effects of the proposed mitigation described?			
Other Questions on Mitigation				

SECTION 6 NON TECHNICAL SUMMARY				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
6.1	Does the Environmental information include a Non-Technical Summary?			
6.2	Does the Summary provide a concise but comprehensive description of the Project, its environment, the effects of the Project on the environment and the proposed mitigation?			
6.3	Does the Summary highlight any significant uncertainties about the Project and its environmental effects?			
6.4	Does the Summary explain the development consent process for the Project and the role of EIA in this process?			
6.5	Does the Summary provide an overview of the approach to the assessment?			
6.6	Is the Summary written in non-technical language, avoiding technical terms, detailed data and scientific discussion?			
6.7	Would it be comprehensible to a lay member of the public?			
Other Questions on Non Technical Summary				

SECTION 7 QUALITY OF PRESENTATION				
No.	**Review Question**	**Relevant?**	**Adequately Addressed?**	**What further information is needed?**
8.1	Is the Environmental Information available in one or more clearly defined documents?			
8.2	Is the document(s) logically organised and clearly structured so that the reader can locate information easily?			
8.3	Is there a table of contents at the beginning of the document(s)			
8.4	Is there a clear description of the process which has been followed?			
8.5	Is the presentation comprehensive but concise, avoiding irrelevant data and information?			
8.6	Does the presentation make effective use of tables, figures, maps, photographs and other graphics?			
8.7	Does the presentation make effective use of annexes or appendices to present detailed data not essential to understanding the main text?			
8.8	Are all analyses and conclusions adequately supported with data and evidence?			
8.9	Are all sources of data properly referenced?			
8.10	Is consistent terminology used throughout the document(s)?			
8.11	Does it read as a single document with cross referencing between sections used to help the reader navigate through the document(s)?			
8.12	Is the presentation demonstrably fair and as far as possible impartial and objective?			
Other Questions on Quality of Presentation				

Generic review framework for oil terminals

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