

BMP Guidelines

– for preparing an

**Environmental Impact Assessment (EIA) report
for activities related to hydrocarbon exploration
and exploitation offshore Greenland**

Danish National Environmental Research Institute
Greenland Institute of Natural Resources
and Bureau of Minerals and Petroleum
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1 Introduction

This document is meant as a guide to licensees when preparing an Environmental Impact Assessment (EIA) of activities related to exploration, development, production, transport and decommissioning of hydrocarbons offshore Greenland.

All offshore hydrocarbon activities are subject to approval by Bureau of Minerals and Petroleum (BMP) before commencement. More comprehensive activities, such as exploration drillings etc. are subject to approval by the Greenland government. The licensees shall submit an application for approval of an activity to the BMP and the application shall be accompanied by an EIA. The licensee shall thus prepare EIA-reports for their specific activities. The present guidelines outline the requirements set by the BMP for such EIA-reports. The legal requirements are stipulated in Chapter 15 of the Mineral Resources Act (2009).

The BMP has developed specific guidelines for conducting social impact assessment (SIA) reports. Guidelines for such a report are available at the BMP webpage (Link 1, see active links at the end of these guidelines).

Specific guidelines for conducting seismic surveys, including requirements for EIA-report preparation in connection to seismic surveys has

been issued. Reference is made to the web-pages of the BMP and the Danish National Environmental Research Institute (NERI), where these guidelines are available (Link 2). The present guidelines are thus not applicable to seismic surveys.

2 The EIA-report and the EIA-process

EIA-reports shall be prepared throughout the entire lifecycle of a hydrocarbon project. Each major specific activity requires an EIA-report, focusing on the specific activity. Major specific activities include for example: exploration drilling, field development, production, transport and decommissioning. The EIA-reports must be updated and further developed when needed e.g. if plans are changed during the project (see however below on the approval by the government). Although the initial EIA-report primarily shall assess and focus on exploratory drilling, it must include an assessment of scenarios of possible subsequent activities related to production, transport and decommissioning.

The EIA-report shall cover the entire region that might be affected by the activities, including land based activities. Trans-boundary aspects shall also be considered, as for example impacts of oil pollution in waters of neighbouring countries.

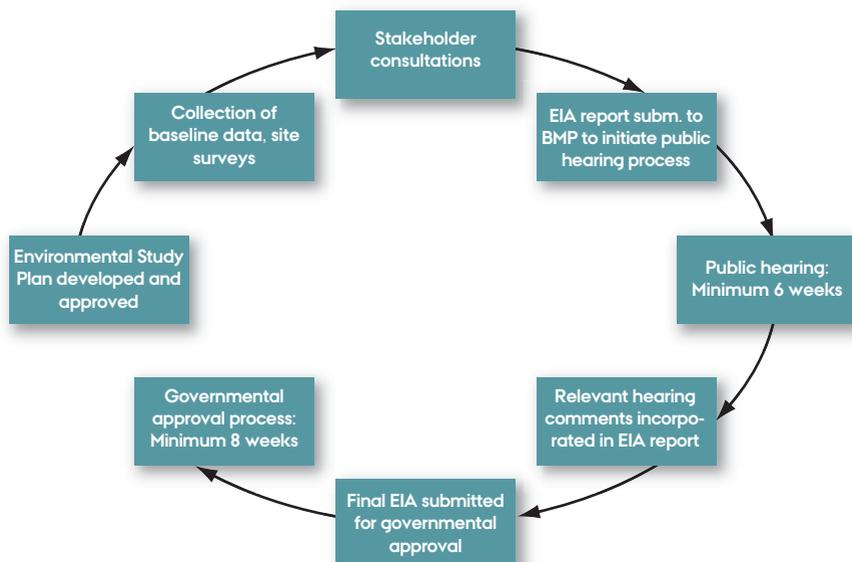
The EIA-report shall be made in Greenlandic and English. A non-technical summary shall be made in Greenlandic, English and Danish. Technical appendices may be submitted only in English.

The EIA-reports will be made available as public documents on the web-page of the Greenland government (Link 3).

The preparation of the EIA-reports is the major part of the EIA-process. The EIA process also includes the preparation of a number of plans to be reported and approved by BMP with NERI and Greenland Institute of Natural Resources (GINR) as advisors. The plans shall be referenced in the EIA-reports.

An Environmental Study Plan (ESP) shall be prepared as a part of the EIA-process. It shall be prepared and updated in relation to the developing hydrocarbon plans and in collaboration with BMP/NERI and GINR. The ESP shall describe how environmental data will be procured and prepared. It shall secure that data necessary to update the EIA-reports are available when needed. It shall also secure that baseline data for assessing the impact of accidents are available. Site surveys at exploratory drill sites are for example a part of the ESP.

When preparing the plan for the EIA-process the licensee shall take into consideration the following timing aspects:



The Greenland authorities may demand that the licensee shall conduct stakeholder consultation in connection with preparing the EIA. The stakeholder consultations can be conducted in connection with preparing the Social Impact Assessment.

The EIA-report shall be submitted for public review. The public hearing process shall have a duration of at least 6 weeks, and shall include local authorities, stakeholders and the general public.

The EIA-report shall be submitted to the BMP who makes the electronic versions of the report available on the Greenland government webpage. The BMP may demand that the licensee makes physical copies of the EIA-report available for public review at local municipalities' offices, libraries etc.

The local authorities, stakeholders and the general public shall have the opportunity to submit their comments on the EIA-report to the licensee. The licensee shall forward the incoming comments to the BMP. Relevant comments shall be discussed and incorporated by the licensee in the final version of the EIA-report, which shall be submitted (together with a list of the changes made) to the BMP for further governmental approval. Incoming comments submitted through the public hearing process may be made

public, as comments, or extracts hereof, may be incorporated in the final version on the EIA.

The EIA-report can only be approved once it has been updated by incorporating relevant comments from the hearing process. When the specific EIA-report has been approved by the Greenland Government (Naalakkersuisut), the report is final and no further changes can be made.

NERI and GINR – acting as BMP's scientific advisors – will on an independent and scientific basis evaluate the EIA-reports submitted, particularly with focus on expected environmental impacts and on the described BAT and BEP solutions. NERI and GINR's evaluation will form part of the basis for Greenland Government's decisions.

3 Strategic Environmental Impact Assessments and databases for environmental data

The National Environmental Research Institute, Denmark (NERI) and Greenland Institute of Natural Resources (GINR) prepare regional Strategic Environmental Impact Assessments (SEIA) before new regions are opened for hydrocarbon exploration. These SEIAs cover the area that potentially could be affected by the activities. To pro-

vide up-to-date knowledge for the SEIA-process (and for subsequent EIA-reports) additional environmental studies are conducted funded by the authorities.

The SEIAs are important sources of information when preparing the EIA-reports. These SEIAs include a number of maps showing different environmental elements and based on GIS layers (Geographic Information System). The layers will be updated as new data are retrieved and they will be available to companies preparing EIA-reports. A further important source of information is the "Environmental Oil Spill

Sensitivity Atlas for the West and South Greenland Coastal Zone" prepared by NERI (is available on the web-page, Link 4).

NERI - which acts as the Greenland Government's scientific independent advisor - will keep and update databases of all environmental data collected in connection with hydrocarbon activities, both from the authorities and the license holding companies. Data must be submitted to NERI in formats agreed to by BMP/NERI, and will be available to BMP/NERI and all companies preparing EIA-reports.



4 Structure and content of the EIA-report

Appendix 1 outlines a proposed structure and table of content of an EIA-report. BMP/NERI indicate, where relevant, issues to be included and environmental standards to be applied. New environmental knowledge or technology may change standards to be met. At any time and during all phases of the hydrocarbon activity the Best Available Technology (BAT) and Best Environmental Practice (BEP) must be applied and used in order to minimize environmental impacts. For definition of these terms, please refer to OSPARs webpage (Link 5 and below¹).

When these guidelines were developed, important EIA-report information was found in guidelines and EIA-reports from other Arctic countries and institutions: for example Canada (Link 6), The Arctic Council's workgroup on Protection of the Arctic Marine Environment (PAME) (Link 7) and the Arctic Council Assessment of Oil and Gas Activities in the Arctic (Link 8).

The following outline is based on the Arctic Council's Arctic Offshore Oil & Gas Guidelines and on the 'OSPAR Guidelines for Monitoring the Environmental Impacts of Offshore Oil and Gas Activities' (Link 9).

¹"...As defined in Appendix 1 of the OSPAR Convention BAT "means the latest stage of development (state of the art) of processes, of facilities or of methods of operation which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste". BEP is defined as "the application of the most appropriate combination of environmental control measures and strategies".

"..It follows that BAT and BEP for a particular source will change with time in the light of technological advances, economic and social factors, as well as changes in scientific knowledge and understanding".

Appendix 1:

Guidelines to the contents of an EIA-report for activities related to hydrocarbon exploration and exploitation

This section gives an overview of the contents of an EIA-report. The number of pages in this shall not exceed approx. 100 pages (A4). Note that the different plans mentioned in section 6 (below), shall be submitted as appendices to the EIA-report.

1. Extended non-technical summary

A non-technical summary which shall describe, in short, the project and a conclusion including preferred options compared to alternative solutions, important potential environmental effects, mitigation, uncertainties and the response from the public hearings. The summary shall be presented in Greenlandic, Danish and English.

2. Introduction shall include:

- A description of the company/ companies.
- The location of the license area.
- The purpose of the project.
- A time schedule of all activities covered in the EIA.

3. Environmental setting shall include concise descriptions of:

- Climate: air temperature, wind, visibility, extreme winds, etc.

- Bathymetry.
- Oceanography: water temperature, salinity, currents, waves, tides, water masses, etc.
- Ice conditions: sea ice and icebergs, concentrations, thickness/draft/mass, drift speed, iceberg scour, etc.
- The biological environment with emphasis on species and how they function and interact in the ecosystem, including:
 - a) The benthic and pelagic communities.
 - b) Commercially important fish and invertebrate species described on a species by species basis (occurrence, spawning, etc.). The importance of the licence area for each species shall be evaluated on a seasonal basis.
 - c) Marine birds on a species by species basis (seasonal abundance, breeding and concentration areas, etc.). The importance of the license area to each species shall be evaluated on a seasonal basis.
 - d) Marine mammals on a species by species basis (seasonal abundance, breeding, concentration areas, etc). The importance of the license area to each species shall be evaluated on a seasonal basis.

- A summary description of threatened species, national responsibility species and species of conservation concern.
- A summary description of important habitats and/or areas of particular ecological importance, e.g. upwelling areas, coral reefs, sponge grounds, ice edge communities and polynyas.
- A summary description of Valued Ecosystem Components (VECs, see definition in the Regional Strategic Impact Assessment of the Eastern Baffin Bay region on NERIs website (Link 10)).
- Baseline chemistry and pollution level (hydrocarbons, heavy metals etc.).
- Present use of natural resources (fishing, hunting, tourism).

4. Activities and emissions, this section shall include:

- A description of proposed activities, including their purpose, location, duration and intensity, including drilling platforms, ships, pipelines, loading facilities, port facilities etc.
- Energy requirements.
- Use of chemicals: It should be noted that all chemicals planned to be used or discharged must have been tested and evaluated for their eco-toxicological properties according to OSPAR Harmonized Offshore Chemical Notification Format (HOCNF). Chemicals that will pose the low-

est risk on the environment shall be selected, in particular those on OSPARs PLONOR list (Link 11) and the chemicals shall also be included in the Danish Product Register PROBAS.

- Drilling muds: It shall be noted that only water based drilling muds will be approved.
- Waste handling (to be described in more details in the Waste Handling Plan).
- Emissions to air shall be described including an estimate of amounts and how emissions are minimized by BAT and BEP. A monitoring plan shall be developed as a separate document describing how emissions are monitored.
- Discharges to water (types, amounts) shall be described and the amounts of polluting substances shall be estimated. It shall be described how discharges are minimized by applying BAT and BEP and how compliance is ensured. A monitoring plan must be developed as a separate document describing how polluting discharges are monitored.
- Decommissioning shall be described if or when the activities do not continue, and if so a separate decommissioning plan shall be submitted.
- Alternative project development options shall be described in order to compare and assess, and arguments for the selected solution shall be presented.

- See Appendix 4 for some important environmental standards and demands to be met.

5. The impact analysis shall include:

- Risk for and impacts of acute oil spills, including trajectory modelling in the marine environment.
- Evaluation of effects of emissions of other contaminants to water and air.
- Impacts of noise, in particular underwater noise on marine mammals and fish.
- Effects on seabirds and marine mammals from disturbances (e.g. helicopters).
- Effects of lights and flaring, in particular attraction of birds.
- Impacts on fishing and hunting.
- Cumulative impacts with other human activities in and near the license area should be considered.
- The risk of introducing new and potential invasive species.
- A description of the predictive methods used to assess effects on the environment and a discussion of limitations in this assessment for example due to lack of data.
- Complete reference list.

6. Separate plans to be submitted as appendices to the EIA-report:

- An Environmental Management Plan describing measures to be taken in order to mitigate impacts on the environment.
- Waste handling plan.
- Plans for monitoring and reporting emissions and discharges.
- A plan for monitoring environmental impacts of routine operations.
- A plan for monitoring environmental impacts of accidents.
- Decommissioning plan.
- Environmental study plan (ESP). See above in section 2.

Appendix 2: Environmental Assessment Flowchart

Phase	Procedure	Activity	Responsible
Opening of new area for petroleum activities	SEIA Hearing Governmental approval Opening	Environmental studies Strategic environmental impact assessment (SEIA) Licence round	Authorities
Exploration	EIA Risk assessment Contingency planning and emergency response	Seismic Baseline survey Drilling	Operator
Development and production	EIA Risk assessment Contingency planning and emergency response	Baseline survey Monitoring Construction activities Drilling Production Transportation	Operator
Decommissioning	EIA-report	Monitoring Demolition Transportation Reuse and waste deposition	Operator

Appendix 3:

Links to web pages quoted above

Link 1:

http://www.bmp.gl/petroleum/SIA_guidelines.pdf

Link 2:

<http://www2.dmu.dk/Pub/FR785.pdf>. http://www.bmp.gl/petroleum/seismic_acquisition.html

Link 3:

www.bmp.gl

Link 4:

<http://environmental-atlas.dmu.dk>.

Link 5:

http://www.ospar.org/content/content.asp?menu=00460109180000_000000_000000

Link 6:

www.cnlopb.nl.ca/

Link 7:

<http://pame.is/offshore-oil-and-gas/iformation-and-links-regarding-eia-from-arctic-states>

Link 8:

<http://www.amap.no/oga>

Link 9:

http://www.ospar.org/documents/dbase/decrecs/agreements/04-11e_OSPAR%20offshore%20guidelines%20monitoring.doc).

Link 10: <http://www2.dmu.dk/Pub/FR720.pdf>

Link 11:

http://www.ospar.org/documents/DBASE/DECRECS/Agreements/04-10_PLONOR%202008%20REVISION.doc

Appendix 4:

Some important environmental standards and demands to be met in Greenland

- Heavy fuel oil and oil with a sulphur content >1.5 % will not be allowed.
- Norwegian standards (Link 1) and the OSPAR convention standards (Link 2) shall as a minimum be applied regarding release of drill cuttings and mud.
- Use of chemicals: A list of chemicals planned to be used or released shall be a part of the drilling application. The expected amounts used shall be estimated and the chemicals must have been tested and evaluated for their eco-toxicological properties according to OSPAR Harmonized Offshore Chemical Notification Format (HOCNF). The operator must select those chemicals that will pose the lowest risk of environmental impact, in particular those on OSPARs PLONOR list. Reference is made to OSPARs homepage (Link 3). Furthermore, the chemicals shall be included in the Danish Product Register PROBAS. The evaluation of the chemicals has to be documented to and approved by BMP.

Link 1:

<http://www.ptil.no/activities/category404.html>

Link 2:

<http://www.regjeringen.no/nb/dep/md/dok/regpubl/stmeld/20052006/stmeld-nr-8-2005-2006-.html?id=199809>

Link 3:

http://www.ospar.org/documents/DBASE/DECRECS/Agreements/04-10_PLONOR%202008%20REVISION.doc

