NIMOS

Environmental Assessment Guidelines
Volume IX : Part 1
Offshore Oil and Gas
Reconnaissance and Exploration Drilling

September 2020

National Institute for Environment and Development in Suriname
(NIMOS)

Environmental Assessment Guidelines

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FOREWORD

After years of planning and preparations for the formulation of the *Environmental Assessment Guidelines Volume IX: Part I Offshore Oil and Gas Reconnaissance and Exploration Drilling*, they are final for our use.

These Guidelines are the first part of a series of Guidelines related to the Offshore Oil and Gas sector in Suriname. A second set of Guidelines will follow that pertain to the Production and Development stage of this sector. We firmly believe that the division of the Guidelines in two parts makes it practical and efficient to deal with the sector in the context of environmental matters. Furthermore, these Guidelines fit in the current legal framework in Suriname, namely the Environmental Framework Act, the National Oil Spill Contingency Plan (NOSCP) and the Production Sharing Contract (PSC) for this industry.

Throughout the document, the *Nationale Milieu Autoriteit* (*NMA*) is mentioned as the entity responsible for the supervision and enforcement of the Guidelines. Currently, NIMOS is transitioning into the NMA and it is certain that this Authority will adopt these Guidelines. Nonetheless, during this transition process NIMOS will be responsible and accountable for the maintenance, supervision and enforcement of the EIA process, including these Guidelines.

Finally, NIMOS wants to express its gratitude to WWF Guianas, the Netherlands Commission for Environmental Assessment (*Commissie voor Milieu Effecten Rapportage Nederland* (*MER-Commissie*) and Heike Phlasterer respectively for their financial support and immensely important technical expertise in formulating and completing these Guidelines. Our appreciation also goes to Staatsolie N.V., the other companies in the Oil and Gas sector as well as the individual consultants and NGOs in this industry for their substantive contribution in finalizing the Guidelines. The knowledge shared with NIMOS by all involved, has laid the basis and provided a path forward for a continued institutional strengthening of our personnel and other relevant stakeholders.

Cedric Nelom
Acting General Director

Table of Content

ABBREVIATIONS

ALARP	As Low As Reasonably Practicable
AOI	Area of Influence
ARPEL	Regional Association of Oil, Gas and Biofuels Sector Companies in Latin America and the Caribbean
BAT	Best Available Technique
CARICOM	The Caribbean Community
CBD	Convention on Biological Diversity
E&P	Exploration and Production
EBS	Environmental Baseline Survey
EFA	Environmental Framework Act
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMMP	Environmental Management and Monitoring Plan
EMS	Environmental Management System
FPIC	Free, Prior, Informed, Consent
GIIP	Good International Industry Practices
IADC	International Association of Drilling Contractors
IFC	International Finance Corporation
ILO	International Labor Organization
IMO	International Maritime Organization
IOGP	International Association of Oil & Gas Producers
IPIECA	The Global Oil and Gas Industry Association for Advancing Environmental and Social Performance
IUCN	International Union for Conservation and Nature
JNCC	Joint Nature Conservation Committee
LVV	Ministry of Agriculture, Animal Husbandry and Fishery
MARPOL	International Convention for the Prevention of Pollution from Ships
MAS	Maritime Authority Suriname
MMO	Marine Mammal Observer
MUMA	Multiple Use Management Area
NCCR	National Coordination Center for Disaster Management
NIMOS	National Institute for Environment and Development in Suriname
NMA	National Environmental Authority
OSPAR	Convention for the Protection of the Marine Environment of the North-East Atlantic
PAM	Passive Acoustic Monitoring
PCA	Principal Component Analysis
PPE	Personal Protective Equipment
PSC	Production Sharing Contract
SEP	Stakeholder Engagement Plan

SHI N.V.	Staatsolie Hydrocarbon Institute N.V.
ToR	Terms of Reference
UNCLOS	United Nations Convention on the Law of the Sea
UN SDG	United Nations Sustainable Development Goals
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNGP	United Nations Guiding Principles on Business and Human Rights
VC	Valued Components
WBG	World Bank Group

DEFINITIONS

Appraisal drilling	Appraisal drilling means drilling (being part of Exploration) carried out following a Discovery for the purpose of delineating a Petroleum Field and determining whether or not such Petroleum Field merits Development.
Area of Influence	The area likely to be affected by: (i) the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent (IFC PS1).
Baseline data	Baseline data comprises all information relevant to describe the state of the environment prior to a project being undertaken. This includes environmental, socio-cultural and socio-economic data.
Calendar days	All days of the week, including Saturdays, Sundays and holidays.
Days	Days, excluding Saturdays, Sundays and holidays.
Environment	The coherence of the living and non-living environment of humans, animals and plants, including the social and economic aspects in the broadest sense.
Environmental Baseline Survey	A multi-disciplinary site survey conducted prior to implementation of the proposed project. The purpose of the survey is to document the environmental conditions in the area of investigation, including sensitive environmental features and contamination levels as a basis for the impact assessment and comparison against any later survey results.
Environmental Impact Assessment	An assessment to predict, anticipate and avoid or, if necessary, reduce the potential impacts of a proposed project and activities, carried out by experts in the field using a variety of methods, both scientific and technical.
Environmental Impact Statement	The result of the Environmental Impact Assessment.
Exploration drilling	Exploration drilling means all drilling activities carried out in the search for Petroleum, Appraisal of Discoveries and subsequent activities leading to the decision of whether or not to submit a Development Plan and any subsequent preparation of a Development Plan. Exploration drilling shall include all plugging, abandonment, and rehabilitation activities associated with Exploration Wells.
Good International Industry Practices	Good International Industry Practice is described as the exercise of professional skill, diligence prudence and foresight that would be reasonably expected from skilled and experienced professionals engaged in the same type of undertaking in the same or similar circumstances globally or regionally (IFC PS 3).

Offshore	Offshore refers to operations undertaken at, or under the, sea in association with an oil, natural gas or condensate field that is under the seabed, or to activities carried out in relation to such a field. Offshore is part of the upstream sector of the oil and gas industry.
Protected areas	A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values (IUCN).
Public hearing	Public hearings are stakeholder meetings which are announced in the media.
Reconnaissance	Reconnaissance is the preliminary examination of the general geological features and characteristics of a region. Seismic surveys are part of reconnaissance.
Seismic survey	The Seismic survey is one form of geophysical survey that aims at identifying the earth's (geo-) properties by using sound waves to evaluate the differing reflective properties of rock strata. It is typically used to determine the hydrocarbon potential of a field or reservoir.

1 INTRODUCTION

Protecting the environment is embedded in Suriname's Constitution. As oil and gas activities can have a negative impact on the environment, it is important to conduct those activities in a manner that meets the highest environmental and socio-economic standards.

This document constitutes the Environmental Assessment Guidelines for the upstream offshore petroleum sector, covering the phases of seismic and other geophysical data acquisition as well as exploration drilling.
The requirements of these Guidelines relate to the need to undertake an Environmental Impact Assessment (EIA) including any associated environmental survey to obtain baseline data and support the evaluation, mitigation and management of project related impacts. All offshore petroleum projects are required to go through the EIA process starting with the Scoping phase. The decision to start from the scoping phase was made, because offshore petroleum projects have been specifically categorized (Table 1). This, is further elaborated on in section 2 of these Guidelines.

As petroleum projects might be located in coastal, nearshore or deeper waters each project may face area specific environmental issues (e.g. coral reefs or fisheries) which would need to be considered.

While these Guidelines aim to promote the use of good practice, each submission for environmental approval must be assessed on its own terms and the proponent remains responsible for the quality and content of the submissions for environmental approval and for complying with all legal requirements. No liability can be placed on these Guidelines and/or the use thereof for application rejections.

During the drafting of these Guidelines the approval of the Environmental Framework Act (EFA) occurred, which means that NIMOS will eventually merge into the National Environmental Authority (NMA). This does not alter the fact that the Guidelines will apply during and after the transition, which means that NIMOS will continue to supervise and enforce the process until the actual transition into the NMA.

These Guidelines derive from the EFA and all the conditions within the Law are part of these Guidelines. Further, if there is a conflict, the Law takes precedence.

1.1 Objectives and Scope

The purpose of these guidelines is to provide a clear and comprehensive guide for Environmental Impact Assessment for offshore[1] Oil and Gas projects in the reconnaissance and exploration drilling phase in accordance with the EFA and the Generic Environmental

[1] Offshore projects could also include onshore facilities (AOI).

Assessment Guidelines (Volume 1, 2009[2], hereafter referred to as the Generic Guidelines). With these Guidelines guidance and instructions are provided on how oil and gas project proponents should follow the environmental permitting process in Suriname.
The Guidelines will only focus on:

- Reconnaissance and Exploration drilling; and
- The requirements and methodologies for offshore environmental baseline surveys (Appendix A).

1.2 Roles and responsibilities

Depending on the circumstances of the submitted project application, the major actors in the EIA process can be divided into:

- The proponent;
- NMA;
- Staatsolie Hydrocarbon Institute N.V. (SHI N.V.) and any other agency or organization as determined through Surinamese laws and regulations;
- Other expert authorities/institutes who will assist NMA;
- The public.

The proponent is responsible for:

- Preparing a Scoping report including the Terms of Reference (ToR) for the EIA;
- Preparing an Environmental Impact Statement (EIS);
- Following up on all Production Sharing Contract (PSC) requirements and other permit conditions, related to the activity;
- Developing and implementing an Environmental Management and Monitoring Program/Plan (EMMP);
- Adequate public participation.

NMA is responsible for:

- Determining whether the level of public participation is appropriate;
- Approving the EIA ToR;
- Reviewing the EIS, taking into account related public comments, and giving its decision to SHI N.V.;
- Ensuring that the EMMP is developed, approved and implemented as part of the EIS;
- Providing an environmental permit to the proponent.

SHI N.V.:

- Includes in its PSC with offshore proponents that an EIA needs to be carried out according to the EIA Guidelines of the NMA.

[2] The Generic Guidelines will be updated periodically, so the year of publication may not be the same.

Expert authorities from other agencies should:

- Provide expert information or knowledge upon request by NMA;
- Review the EIS aiming at scientific and technical accuracy upon request by NMA;

The public:

- Comments on the Scoping report
- Provides input during the preparation of the EIS
- Comments on the draft EIS

1.3 Regulatory context

Exploration in Suriname commenced in the 1930's in the Nickerie district, where the NN1 well reported the presence of oil. In 1965, a water well accidentally discovered oil in the Saramacca district. On 13 December 1980 Staatsolie Maatschappij Suriname N.V. (Staatsolie), the National Oil Company was established to act as the regulator for the PSC that was signed with Gulf Oil. As part of the agreement, Gulf Oil assisted in developing an oil discovery close to the East -West Highway. Staatsolie started its own oil production from the Tambaredjo onshore field in 1982. Through the years Staatsolie developed into an integrated oil company and since it added an electric power plant to its portfolio it is now an established energy company responsible for 75% of Suriname's energy generation.

On January 7th 2020 the first significant oil discovery was made by Total and Apache in Block 58 in deep waters offshore Suriname. Apache and Total have a PSC with Staatsolie concerning this Block. This occasion could mark the beginning of a new chapter in Suriname's petroleum industry.

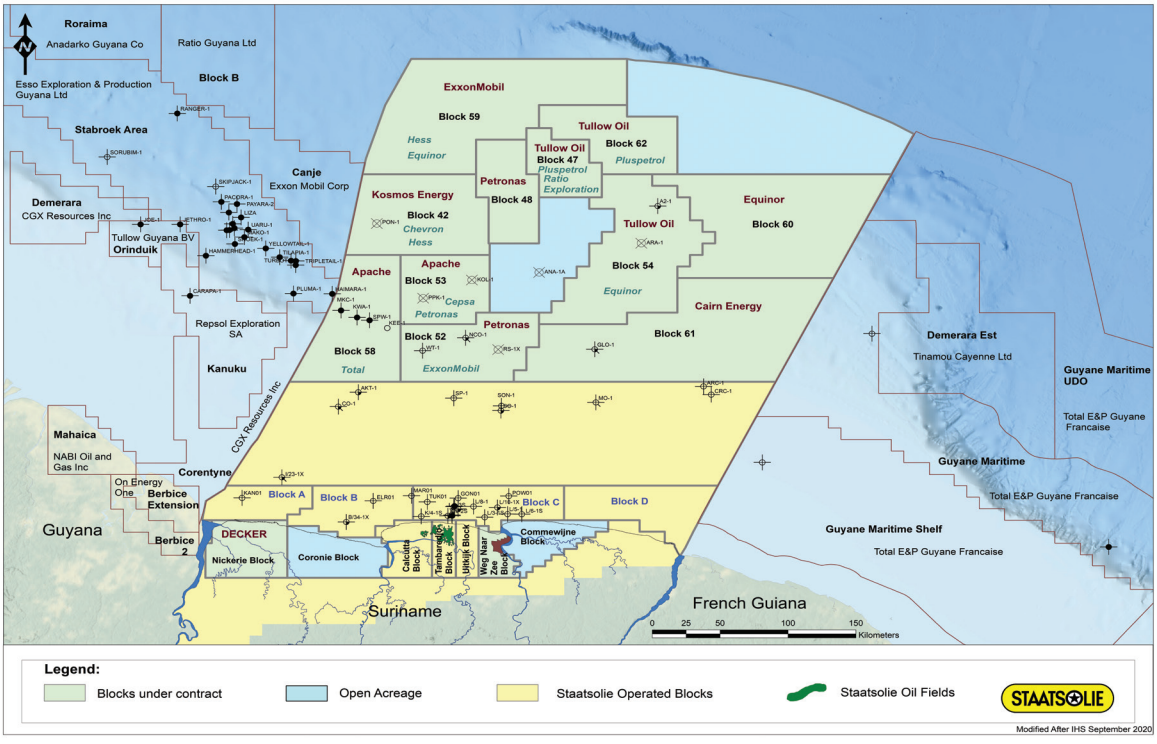

Figure 1: Overview of E&P Blocks Onshore and Offshore Suriname (April 2020)

In an effort to further organize its two functions, on 18 February 2020, Staatsolie's regulator's function was ring-fenced in a limited liability company 100% owned by Staatsolie. This step was taken in an effort to avoid misinterpretation when Staatsolie is executing its two functions:

1. regulator, SHI N.V.;
2. integrated energy company, operator of the onshore fields, operating the refinery, power generation through Staatsolie Power Company N.V. and Staatsolie Afobakka Hydro dam, retail stations via GOW2 and partner in the two gold mines in Suriname.

Institutional responsibilities for the offshore petroleum sector are shared by several governmental institutions such as, but not limited to: MAS, NCCR, LVV. Now, the most relevant national agency with regards to the EIA process is the National Environmental Authority (Nationale Milieu Autoriteit, using the Dutch acronym NMA). As of the 7th of May 2020, with the promulgation of the EFA in the national gazette under S.B. 2020 no. 97, the Environmental Coordination Unit and NIMOS are merged in this newly established statutory body. The NMA is responsible for the implementation of the provisions of the EFA. With the promulgation of the EFA the EIA has now transformed from a voluntary into a mandatory process. In standing with articles 22 and 25 of the EFA implementation regulations on EIA obligatory activities and procedures and criteria are formulated and will be enacted. Also, according to article 28 EFA an environmental permit is needed by public and private organizations and institutes for any activity that will result in the release of a contaminant into the environment. The list of contaminants will be determined by order of the NMA (art. 27.1).

1.3.1 Harmonization with other relevant guidelines

The EIA Guidelines for Offshore Oil and Gas are mostly in sync with the Generic Guidelines related to the EIA process. Mostly because, as explained earlier, NMA has decided to exclude the screening part for Offshore Oil and Gas projects. The guidelines are not a stand-alone document and should be read together with the Generic Guidelines, Guidance Note EIA process and the Social Assessment Guidelines, which are periodically updated. While the Generic Guidelines and the Guidance Note will focus on the process part of the EIA Process, and the Social Assessment Guidelines on the social aspects, the Offshore Oil and Gas Guidelines will provide more details related specifically to the oil and gas sector, including how to acquire baseline information for the EIS.

1.3.2 Good practices on environmental management

Oil and gas projects need to demonstrate compliance with national laws, regulations and environmental standards as the legal minimum. The EIS should include a list of the most relevant ones applicable to the project, including their implications for project execution, see Appendix B.

In case of absence or that national standards are weaker than international performance standards, internationally accepted standards and GIIPs should be adopted as project standards. The Guidelines refer to international standards/guidelines produced by the following organizations such as:

- Regional Association of Oil, Gas and Biofuels Sector Companies in Latin America and the Caribbean (ARPEL);
- International Finance Corporation (IFC) & World Bank Group (WBG);
- International Association of Oil & Gas Producers (IOGP);
- International Union for Conservation and Nature (IUCN);
- Joint Nature Conservation Committee (JNCC);
- The Global Oil and Gas Association for Advancing Environmental and Social Performance (IPIECA);
- International Labor Organization (ILO);
- United Nations Guiding Principles on Business and Human Rights (UNGP);
- United Nations Sustainable Development Goals (SDG);
- International Association of Drilling Contractors (IADC);
- International Maritime Organization (IMO);
- The Caribbean Community (CARICOM).

Guidance can also be found in International Conventions (even if not necessarily ratified by Suriname), for instance the OSPAR Convention, UNCLOS, UNFCCC and MARPOL.

In addition, the following principles should be considered:

- No oil & gas activities in UNESCO, IUCN and Ramsar protected areas (excluding MUMA's);
- No flaring during exploration drilling (unless for emergency reasons). In case of testing during well appraisal, flaring will only be allowed if permitted through the EIA process;
- Avoidance of sensitive habitats (e.g. Deep water coral communities);
- Selection of lowest toxicity chemicals as practicable;
- Reducing risk to As Low as Reasonably Practicable (ALARP);
- Hierarchy of Controls (shown in order of highest to lowest effectiveness):
    - Elimination;
    - Substitution;
    - Engineering;
    - Administration;
- Other, as applicable among others:
    - application of the mitigation hierarchy;
    - polluter pays principle;
    - precautionary principle;
    - application of best available technique (BAT).

Disclaimer: Related to the above the proponent is responsible for ensuring the use of the most suitable documents and latest versions being available at the time of preparing the submission of the EIS for approval.

1.4 Oil and Gas Life Cycle/ Value Chain

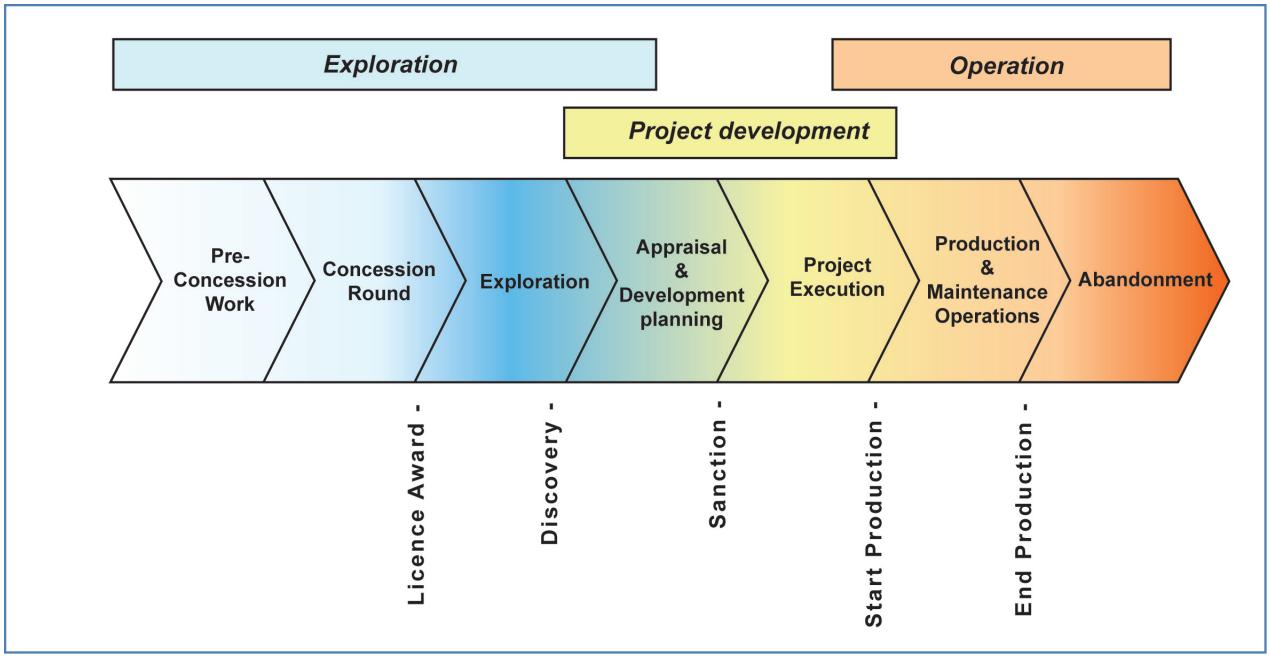

Figure 2: Life cycle of an exploration and production (E&P) venture
Source: O.T Gudmestad et al. (2010)

Figure 2 illustrates the typical life cycle or value chain of an exploration and production (E&P) field. The following text is adapted from Ove Tobias Gudmestad et al. (2010).

- **The pre-concession phase** is managed by the government and focuses on developing knowledge from the national oil and gas potential.
  It is also important at this early stage to build an understanding and gather knowledge on overall environmental and socio-economic risks and opportunities.
  The need for acquisition of reconnaissance surveys, seismic and other data, and different financing options for data acquisition is also discussed during this first phase.
- **Seismic surveys** are conducted to identify potential hydrocarbon reserves (e.g. oil and gas) in geological formations in the subsurface below the seafloor.
- **Exploratory drilling** activities offshore follow the analysis of seismic data to verify and quantify the amount and extent of hydrocarbon resources from potentially productive geological formations. Appraisal drilling is similar to exploration drilling in terms of activities but the purpose however is to delineate and confirm the reservoir extent and hydrocarbon properties. Plugging and abandonment of exploration and appraisal wells is an integral part of this phase.
- **Field development and operation** may occur after exploration/appraisal drilling has located and confirmed economically recoverable hydrocarbon reserves.
- **Decommissioning and abandonment** of offshore facilities takes place once the reservoir is depleted or the hydrocarbon production from that reservoir becomes unprofitable.

1.5 The EIA Guidelines content

Chapter 1 gives an introduction to the offshore Oil and Gas guidelines, the roles and responsibility that each entity will have, the regulatory context and a brief summary of the value chain of the Oil and Gas sector. In chapter 2 the EIA process in Suriname is described for the seismic and drilling operations of the exploration phase, whereas in chapter 3 the scope of the EIA process is included.
The appendices provide additional information to this main document. Appendix A gives guidance for establishing marine baseline and monitoring data. In Appendix B general instructions are included regarding the legal framework and in Appendix C the format of a Scoping application is included. The format of a table of Concordance is provided in Appendix D and Appendix E gives the timeline for the EIA process in Suriname for the Oil and Gas sector.

2 THE EIA PROCESS IN SURINAME

This chapter encompasses general information on the EIA process from project Scoping to the EIS submission for offshore Oil and Gas projects in Suriname and should be read together with the Generic Guidelines. Details on the content of necessary documentation related to the EIA process and associated stakeholder consultation are covered in chapter 3.

2.1 Background

While there was no legislative basis for the assessment of environmental impacts of development proposals in Suriname, in 2009, NIMOS published Environmental Assessment Guidelines Volume I: Generic (Second Edition). The guidelines stipulated in this document are applied by NMA as part of the project permitting process. With the EFA and consequently the legislative basis for the assessment of environmental impact now in place, proponents are expected to comply with the guidelines.

2.2 Overview of EIA process

According to the Generic Guidelines there are three project categories used in the screening of a project application, quoted as following:

Category A: EIA is mandatory
This category includes projects likely to have adverse impacts that may be extensive, irreversible, and diverse. The extent and scale of the environmental impacts can only be determined after thorough environmental assessment. Mitigation measures can only be formulated after the results of the assessment are known.

Category B: EIA will be required or not
This category includes projects whose impact depend on the sensitivity of the location, scale, and predictability. Projects must undergo a checklist after which the decision can be taken whether an EIA is required or not. The necessary environmental information is obtained from the project proponent. For projects that fall under category B, it is necessary to further assess whether:

- The adverse impacts are minor and can be managed with good industry practices. These projects are categorized as Category B, path 1, which means that no EIA is required.
- The adverse impacts are not complex, easy to assess and therefore mitigation measures can be designed without the need for a full EIA. Projects that fall under this sub-category will be required to present partial subjects of the recommended structure of a full EIA or some other form of environmental statement. These projects are categorized as Category B, path 2, which means that a limited EIA is required. This limited EIA can include the following, but not limited to: EMMP/Social Impact Assessment/Waste Management Plans/Environmental Impact Statement/Ecological Impact Study, etc.

- The adverse impacts are likely to be relevant, significant and complex and therefore an EIA will be required. These projects are categorized as Category B, path 3, which means that a full EIA is required.

Category C: No EIA is required
This category includes projects whose impacts are well known, predictable, minuscule in scale and can be mitigated.

With regards to all oil and gas projects in the offshore area, these are categorized according to Table 1, i.e. different to the Generic Guidelines.

Table 1. Categorization Matrix for Oil and Gas projects

Project type	**EIA Category**
Seismic[3]	B2
Exploration	A
Development	A

The EIA flow diagram (figure 3) follows the same path as the EIA flow diagram in the Generic Guidelines with the exception that for the offshore oil and gas sector guidelines, the screening phase is not applicable. The EIA process for the offshore O&G sector therefore begins with the submission of a Scoping application[4] including a Scoping report by the proponent, and is as follows:

- The proponent submits a Scoping application (incl. Scoping report) to NMA;
- NMA reviews and approves the Scoping report if the quality meets NMA requirements[5];
- During the Scoping phase, the proponent has to conduct a stakeholder meeting. As the Screening phase is left out for the offshore projects, the stakeholder meeting should be conducted after the Scoping application is submitted to NMA. One on one meetings with individuals can take place on a voluntary basis in addition to the obligatory stakeholder meeting. See chapter 3.3 for more information regarding the Stakeholder Engagement Plan (SEP);
- After approval of the Scoping report, the EIA will be conducted according to the approved Scoping report. Public participation will also be part of the EIA process;
- After completion of the EIA, the proponent will submit a draft EIS to NMA for stakeholder commenting. The following should be included when submitting the draft EIS:
    - A non-technical summary of the EIS (in Dutch and English);

[3] For the Seismic projects (Category B2) a pre-meeting should be requested by the proponent before submission of their Scoping application. This is to determine if the project will be located in a sensitive area.

[4] See appendix C that provides the content of the Scoping application i.e. the Scoping report.

[5] See chapter 3.1 for the content of the Scoping report.

  - Three (3) hard copies and a digital copy (in Dutch and English).
  - For certain projects, for example in areas of indigenous and tribal people, it may be necessary to also publish the EIS in the local language and also consider the principle of FPIC.
- During the review of the draft EIS by NMA, the proponent has to conduct a public hearing(s) to present the results of the EIA.
- Review of the draft EIS and commenting is open for the public for 30 till 90 calendar days, depending on the complexity of the project.
- After review of the draft EIS, and having met the requirements of NMA, the final EIS (2 hard copies and a digital copy) should be submitted for approval to NMA.
- NMA provides requirements on the final EIS and notifies SHI N.V. of it. Based on the requirements the proponent will also get an environmental permit from NMA.

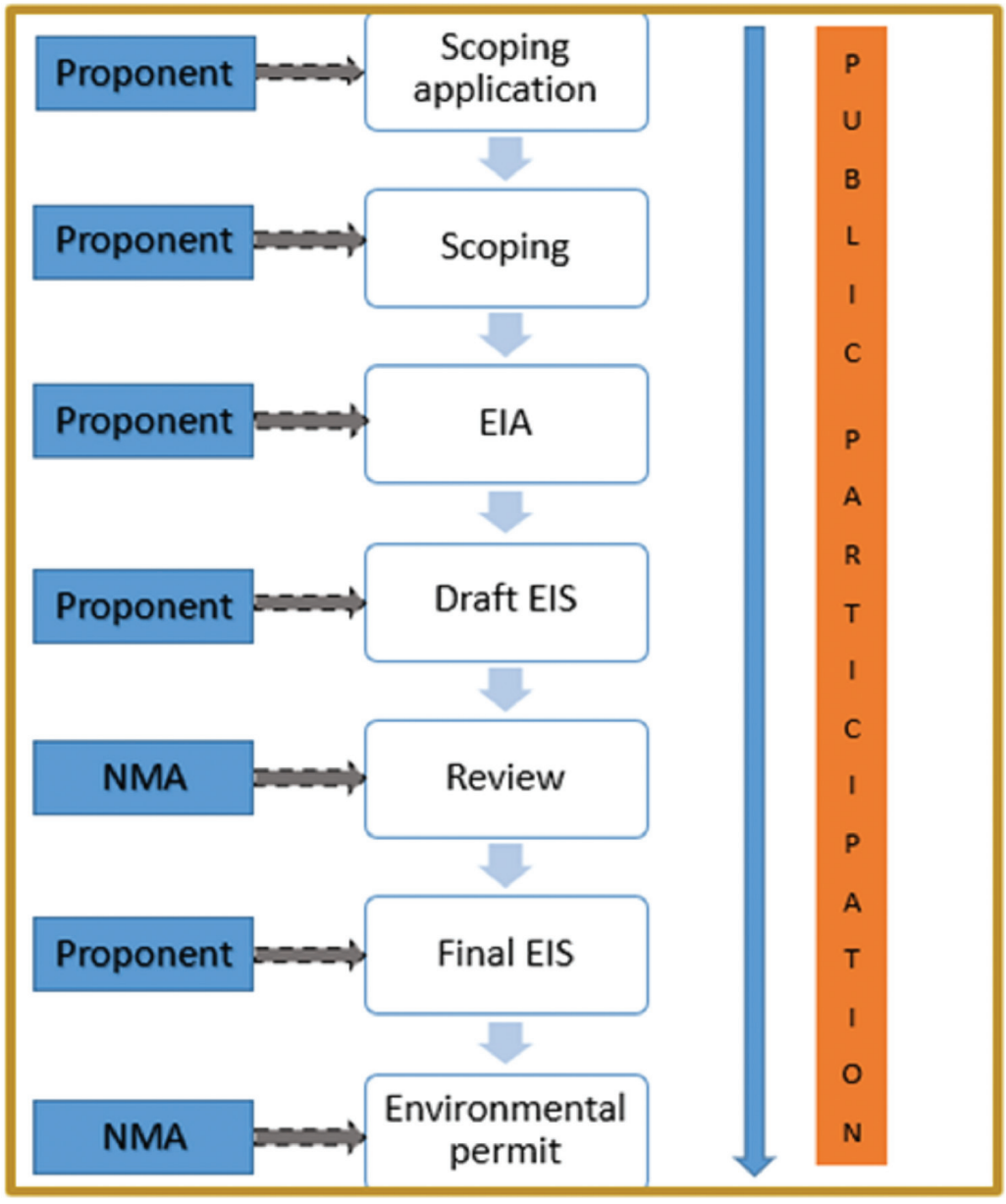

Figure 3: EIA flow diagram for the Oil and Gas sector

[6] The appendices/annexes (excluding the EMMP) do not necessarily have to be submitted in Dutch.

2.2.1 The Scoping phase

The scoping phase (figure 4) includes the following steps:

- The proponent submits a scoping application to NMA (see Appendix C for the format/template of the Scoping application) together with a scoping report. The proponent should consider the need of a consultant to conduct the Scoping for the EIA. If the proponent has the expertise in house, they can perform the Scoping themselves, but for the smoothness of the process it is recommended that a consultant is already in place. Local content must be considered when selecting the consultant (Guidance Note EIA process);
- NMA determines if site-specific issues are involved. For the Seismic projects (Category B2) a pre-meeting should be requested by the proponent before submission of their Scoping application. This is to determine if, for example, the project will be located in a sensitive area. If affirmative, NMA will notify the proponent that a revision of the project category is required and that the proponent should submit the Scoping application as a Category A;
- If negative, NMA will review the scoping application in a regular way;
- The proponent has to conduct stakeholder meetings related to the draft scoping report; these meetings should be held **within 10 days** after submitting the scoping application. This because comments and advice from NMA will only follow after the stakeholder meeting. See chapter 3.3 for more information regarding the stakeholder engagement plan;
- The proponent updates the scoping report; this will be resubmitted to NMA in digital copy. If the scoping report meets the requirement of NMA, the proponent has to submit two (2) hard copies and a digital copy of the final Scoping report to NMA (in Dutch and English)[7], after which approval will be given.

[7] For certain projects, for example in areas of indigenous and tribal people, it may be necessary to also publish the Scoping report in the local language and also consider the principle of FPIC.

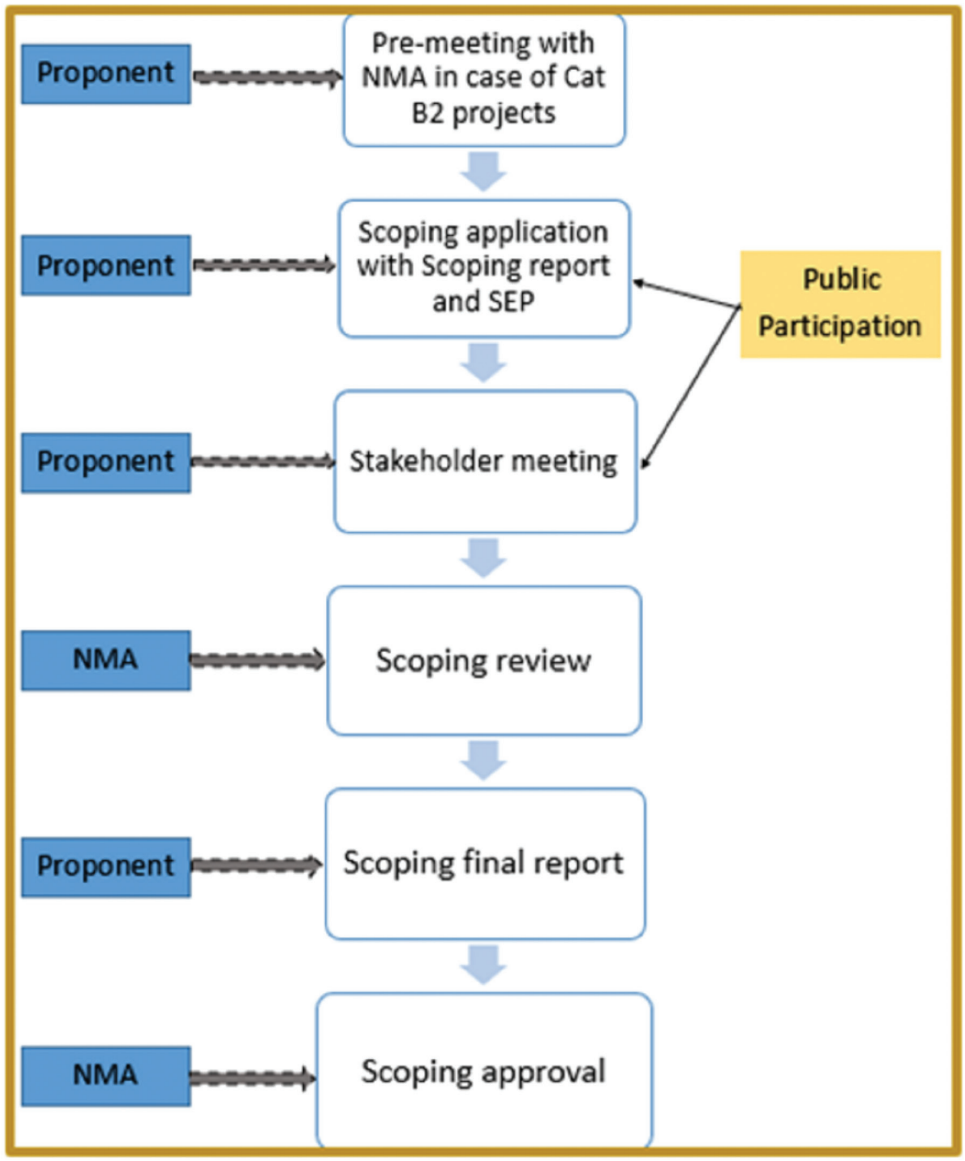

Figure 4: Scoping phase flow diagram for the Oil and Gas sector

2.2.2 The EIA phase

The EIA phase (figure 5) is as follows:

- The EIA consultant of the proponent conducts the EIA which may include third party studies such as an environmental baseline survey and modelling (as defined in the approved Scoping report). The impact assessment to be undertaken should be according to a predefined and transparent assessment methodology supported by field data, with appropriate scientific data and the results of modelling exercises.
- Regarding the baseline data, NMA has no objection if existing data is used, provided that the most recent dataset is not older than 5 years and that it is project location-specific.

8 This does not apply to metocean data. Regarding metocean data the proponent should contact NMA for specific instructions.

- The proponent submits the draft EIS in hard copy (3x) and digital copy to NMA for review. All raw data, (e.g. of the environmental baseline survey) should also be submitted to NMA as long as it is not commercially sensitive or confidential. This should be done in a usable format e.g. in an Excel sheet format or CSV format. Also, shapefiles (and/or geodatabases with a Coordinate reference of EPSG:32621, WGS 84/UTM zone 21N), videos, pictures, etc. are required to be included;
- NMA reviews the draft EIS within the timeframe given in Appendix E; in case of assistance required due to lack of in-house expertise and/or different mandates of the various competent agencies (e.g. cultural heritage), other institutions/experts will be involved in the review. A stakeholder process is conducted by the proponent giving the stakeholders the opportunity to review the draft EIS. See chapter 3.3 for the SEP;
- NMA compiles a review report with the stakeholder comments incorporated for the proponent. All the comments sent to the proponent/consultant during the 30-90-day stakeholder review period should also be sent to NMA at the end of that review period.
- The proponent revises and resubmits the EIS in electronic form to NMA;
- After additional comments by NMA, final revision of the EIS is done if necessary;
- The proponent submits the final EIS in hard copy (2x) and digital copy to NMA;
- NMA issues an environmental permit to the proponent. The environmental permit has a validity date. The duration of this date depends on the project. The validity of an environmental permit for seismic and exploration drilling projects is three (3) months after the **stated project completion**.

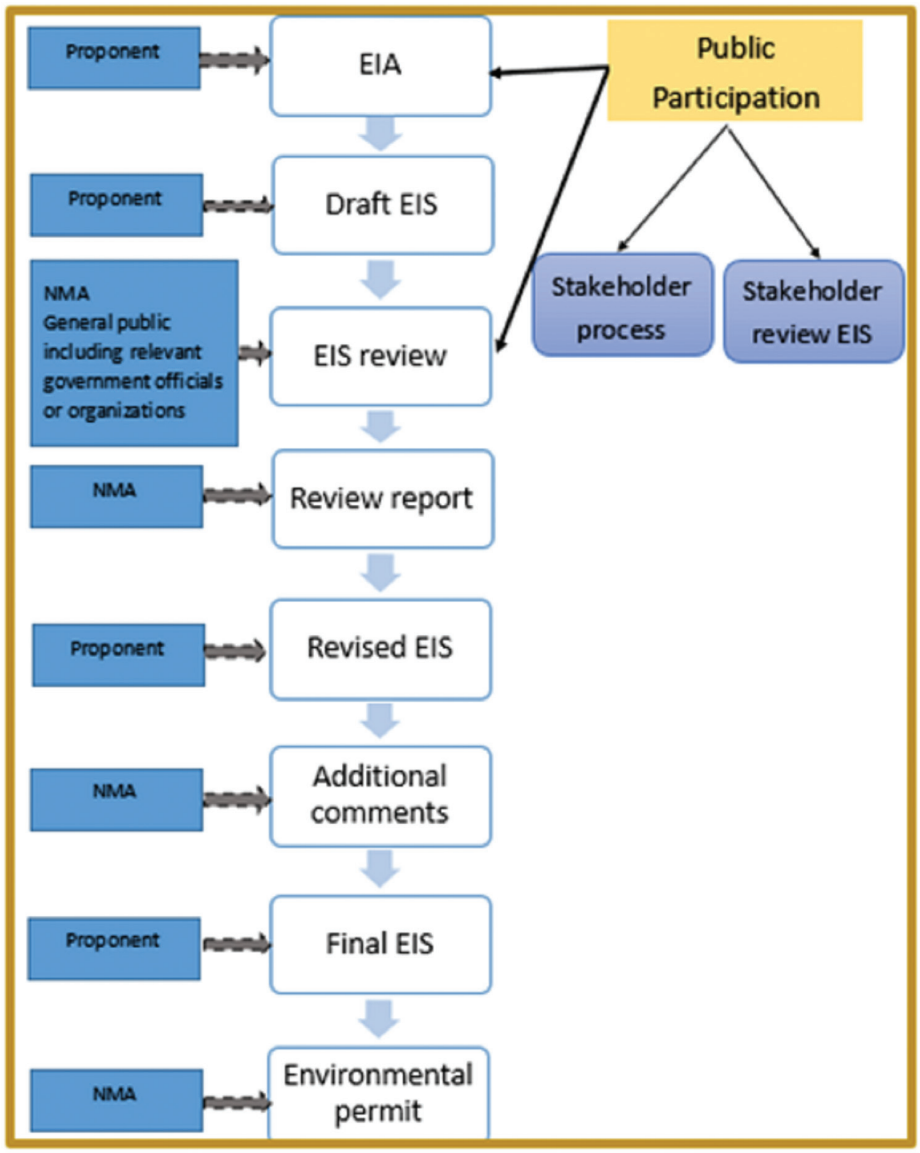

Figure 5: Assessment and review phases flow diagram of the Oil and Gas sector

2.3 Seismic acquisition

This section provides relevant specific guidance for the seismic acquisition phase.

2.3.1 Seismic acquisition EIAs

Seismic projects are categorized as Category B, path 2 projects, which means that a limited EIA is required. However, if there are sensitive environments (e.g. coral reefs, sea grass meadows, whale migration season and routes, spawning grounds, etc.) seismic projects could become Category A. Guidance on this category is to be followed as per the Generic Guidelines. Seismic surveys include 2D and 3D surveys. These types of projects require stakeholder engagement (e.g. with the fishery sector, tourism, shipping, etc.) which should be conducted prior to commencement of any physical activities of the project.

2.4 Exploration Drilling

This section provides relevant specific guidance for the exploration (and appraisal) drilling phase.

All projects are categorized as Category A projects which means that a full EIA is required. One EIS would normally be sufficient for NMA to cover an entire exploration drilling program including the drilling of several wells over a certain period of time in various defined locations of the block. But this will not always be the case e.g.:

- Uncertainties might occur after drilling of the first well including e.g. types of mud, well location, drilling unit type, drilling season, metocean data, reservoir conditions, habitat & species of concern, etc.;
- There is also high probability that a proponent will not know all the drilling locations of an exploration program when preparing the EIA. The proponent probably has an idea of the first location but not all.

In such cases NMA could decide that an addendum EIS together with an updated EMMP should be submitted for review. In such case it is important that the addendum EIS is linked to the original EIS with differences being clearly stated.

Appraisal drilling can be part of the exploration drilling program. However, as the technical details for appraisal drilling are unlikely already available during the time of writing the EIS, approval with conditions for appraisal drilling can be given. The conditions could include submitting an addendum EIS to cover appraisal drilling at a later stage while the current EIS would include more high-level impacts and mitigation measures related to the anticipated appraisal activities based on available data.

Addendum EIA and Updated EIA

An addendum EIA is required if there will be an extension of a project that has already taken place. Example: A proponent had already carried out activities in 2015 in their block for which an EIA had been conducted. In 2019 they want to perform additional activities which would require an EIA. In this case an addendum EIA could be sufficient, where aspects of the baseline data should be updated and significance of potential impacts and mitigation measures for negative and positive impacts are re-assessed where applicable. Other criteria to consider in case of an addendum are seasonality, well location, sensitive areas, change of technical or operational aspects, etc.

An updated EIA is required to restart a project that never took off though an EIA was conducted.

With regards to the addendum and updated EIA: there needs to be a link with the previous EIA to avoid any disconnectivity.

3 SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

As is shown in table 1, there are 2 types of categorization of projects, executed in the offshore area of Suriname, namely:

- For Category B projects (seismic projects) a limited EIA is required. For addendum or updated EIAs regarding seismic projects the categorization will remain the same;
- For Category A projects (drilling projects) a full EIA is required. For addendum or updated EIAs regarding drilling projects the categorization will remain the same.

A pre-meeting can be requested to NMA to discuss the Scope of the addendum and updated EIAs.

For seismic projects only certain aspects of the environment are considered such as, but not limited to: social aspects, noise, turtles and mammals. NMA mostly suffices with a desktop study, in case data is already available. However, if there is no data or lack of data of the area, then it needs to be collected.
For drilling projects all aspects of the environment should be considered, such as: biophysical, socioeconomic, air, benthic fauna, etc. The execution of an Environmental Baseline Survey (EBS) is one of the main aspects for drilling projects. Post monitoring is another aspect which should be executed for these projects if required (see appendix A for the EBS and post monitoring).

Below a more general description is given for the content of the Scoping report and the EIS, which is applicable to both types of projects. Nevertheless, for seismic projects generally contents can be generated through a desktop study, looking at certain environmental aspects. For drilling projects there is more collection of quantitative data involved, whereby an EBS is carried out to gain a better understanding of the environment of the project area. Gathering of metocean[9] data and modelling of the fate and behaviour of oil spill and dispersion of drill cuttings are also a part of an exploration drilling EIA.

3.1 Content of the Scoping report

The proponent shall undertake a scoping process and prepare a Scoping report according to Chapter 3 and Annex 6 of the Generic Guidelines (Volume I) and submit it to NMA for review. In table 2, the minimum table of content of a Scoping report is given for seismic acquisition and exploration drilling projects.

[9] Abbreviation of meteorology and oceanography

Table 2: Table of content of a Scoping report for seismic acquisition and drilling projects

- Introduction, background and objectives
- Policy, legal and regulatory framework
- Project description (as far as known during scoping) including AOI
- Baseline environment description (as far as known during scoping) including identification of VCs/receptors
- Alternatives proposed to be assessed
- Impact assessment (routine and accidental events)
- Public participation (for the scoping phase, see chapter 3.3)
- Terms of Reference or Scope of Work for the subsequent EIA including any modelling or surveys to fill data gaps identified during scoping.

The following should be done as part of the Scoping and the outcome should be included in the Scoping report:

- Definition of the Area of Influence (AOI) and identification of potentially affected stakeholders considering not only the project itself but also related facilities and associated developments. The AOI will differ for routine activities and potential unplanned events; it can also differ for different receptors/VCs;
- The need for a gap analysis of available information against the information needed to identify, describe and assess important and/or sensitive receptors and potentially significant impacts. The robustness of secondary baseline data should also be assessed. The review of secondary data and the results of the gap analysis should be linked to the recommendations for the scope of baseline studies and investigations required as part of the ToR for the EIA;
- A transparent and documented scoping exercise where issues/receptors/VCs are either scoped in (for consideration in the EIA) or scoped out (not to be considered further due to limited or no impacts) including the associated rationale;
- Identification of potentially significant impacts (positive and negative, planned and unplanned, direct and indirect);
- Cumulative and transboundary impacts should be scoped;
- Stakeholder consultation as per Guidance Note EIA process and relevant international guidelines for stakeholder consultation e.g. IFC Performance Standards, IFC Stakeholder engagement: A good practice handbook for companies doing business in emerging markets (2007), IDB Meaningful Stakeholder Consultation (2017) and IDB Meaningful Stakeholder Engagement (2019) and chapter 3.3 of these guidelines;
- The Terms of Reference (ToR) for the subsequent EIA - see below.

3.1.1 Terms of Reference for the EIA

The ToR is an integral component/section of the scoping report that needs to identify and describe all relevant topics in detail necessary to allow judgement whether the scope for the EIA is appropriate.

Elements should include, but not be limited to:

- **Executive summary;**
- **Introduction;**
- **Legal and institutional framework:** including consideration of applicable project standards to be applied;
- **Project description:** including need for undertaking, key project components and activities plus any potentially related and associated facilities, technical and organizational aspects, timelines, spatial information, inventories/estimates of discharges/emissions, chemicals use and waste. Consideration of respective project phases (mobilization, construction, project implementation, demobilization/abandonment depending on the project). Normal operating conditions and potential upset conditions, incl. measures such as start-up and shut-down operations, leaks, malfunctions, momentary stoppages, etc.;
- **Evaluation of alternatives:** Alternatives assessed (technically and economically feasible alternatives) including timing of impact-critical activities, routing/siting, technical alternatives, etc. including a rationale for the chosen solution. Also consider the zero alternative;
- **Description of the environment:** Physical, chemical, biological, social/socio-economic environment and associated definition of the area of influence for each scoped in VC (or group of VCs as appropriate) plus possible addition of VCs formerly not identified;
- Definition of the AOI (for each project phase) to include:
    - consideration of permanent and temporary footprints;
    - area outside the potentially affected footprint by direct impacts (e.g. noise);
    - area potentially affected by indirect impacts (e.g. on ecosystem services upon which affected communities' livelihoods are dependent);
    - area potentially affected by unplanned events.

  The study areas may be larger to understand the context in which the VC exists (incl. trends and pressures on the condition of the VC).

  Use of various sources for baseline data (publications, data obtained from state agencies or research organizations, field surveys) and other data collection means (e.g. analysis of aerial photography, interviews).

  A gap analysis forms the basis for the development of the Scope of Work for any environmental or social survey necessary to provide relevant primary data for the EIA, to be supplemented with secondary data as applicable to enable a complete description of the relevant environmental and social baseline conditions. Data quality and/or reliability and limitations/uncertainties must be described including assessment of how these could affect the reliability of the EIA findings.
- **Assessment of environmental impacts, including:**
    - Transparent description of its methodology and assessment parameters plus any modelling undertaken to support the EIA and associated management plans (e.g. oil spill response planning). Clear definition of significance and its thresholds as well as definition of other assessment parameters (e.g. magnitude, extent,

duration, receptor sensitivity, etc.) feeding into the significance assessment. Consideration of pre-mitigation and residual impacts after identification of mitigation measures, direct and indirect, cumulative and transboundary impacts for routine operations and accidental events;
    - Impact assessment findings (and rankings) from routine events as well as accidental events for each project phase (e.g. mobilization, construction, operation).
- **Proposed mitigation measures:** Describing applicable mitigation measures by design, management options or technical requirements. A project impact management summary table (register of commitments) should be compiled (Appendix to EIS) to contain a listing of all described mitigation measures throughout the EIS using a unique ID for each mitigation measure (which would then also be used for the EMMP). Consider differentiation for mitigation by design during planning (e.g. BAT or siting/routing) or additional measures/controls to be made during these implementations;
- **Public consultation (for the EIA phase and beyond, ref. chapter 3.3.1);**
- **Follow-up programs such as the EMMP** to ensure implementation of mitigation measures stated in the EIS and monitoring of their effectiveness to minimize impacts or enhance benefits in line with corporate management systems. Definition of monitoring requirements, frequencies, (financial) means and responsibilities as well as any reporting needs to relevant stakeholders.
    - rehabilitation plan;
    - remediation plan, etc.
- **Demobilization or abandonment plan.**

3.2 Content of the EIS

An EIS should be prepared according to NMA guidelines, international standards of good practice and following the Scope of Work/ToR approved as part of the scoping report (see section 3.1). A good quality[10] non-technical summary should be included.

The EIS should demonstrate integration of environmental and socio-economic issues into project management, planning, design, mobilization, project implementation and demobilization linked to the proponent's health, safety and environment (HSE) management system. The results should be presented in the EIS, including the EMMP, submitted to NMA.

The objective is to demonstrate that specific actions have been taken to avoid, by choice of locations/routes/technologies, and mitigate potential negative impacts as far as possible and that unavoidable residual impacts are properly taken care of. This process should also focus on how to strengthen positive impacts on the society. Proponents should ensure that the requirements for an EIA for all parts of the project and all project phases are identified and understood. The following sections should be considered in the EIS (see box 1).

[10] https://www.iaia.org/uploads/pdf/Fastips_9NonTechnicalSummary.pdf

- Executive summary
- Introduction, background and objectives
- Policy, legal and regulatory framework
- Project description and need for the undertaking (including any related or associated facilities)
- Assessment of alternatives
- Description of the baseline conditions
- Impact assessment of routine and accidental events (including definition of AOI)
- Proposed mitigation measures including project impact management summary table
- Description and significance of residual impacts
- Public participation (update from scoping, for the EIA phase and beyond, see chapter 3)
- EMMP
- Abandonment/enhancing/remediation plan
- References

Box 1: Sections to be included in the EIS

3.2.1 Compliance monitoring and reporting

An Environmental Management System (EMS) is part of an enterprise's overall management system. It includes the organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for implementing and maintaining sound environmental management in a company.
The EMMP is a project-specific series of plans developed to ensure that the project is implemented in an environmentally sustainable manner. While overall responsibility for the environmental performance during project implementation remains with the project proponent, all contractors and subcontractors are required to understand the potential environmental impacts and risks arising from the project and ensure the implementation of mitigation measures to manage those in an adequate manner. These series of plans include e.g.:

- Overall EMS manual (structure and management, interfaces, etc.);
- Waste management plan;
- Pollution prevention plan;
- Oil spill contingency plan;
- Social impact management plan (or similar);
- SEP including grievance mechanism;
- Compliance monitoring.

The EMMP also ensures that the project implementation is carried out in accordance with the EIA and its defined mitigation actions to reduce adverse environmental impacts and enhance positive impacts during the project life cycle. Also, the plan outlines roles and responsibility of the key personnel and contractors who will be in-charge to manage activities at the project site. The EMMP is an integral part of the EIA process and needs to be submitted as part of the EIS. The EMMP particularly depicts how the mitigation measures will be implemented during project implementation and by whom.

EIA follow-up takes place during and after project implementation. This means that compliance monitoring of the project activities take place. Self-monitoring is the responsibility of the project proponent itself. The proponent should submit monitoring reports on a regular basis, which depends on the duration of the project. There are two phases of monitoring, namely:

1. During the project activities:
    a. For seismic activities: MMO/PAM reports should be submitted to NMA on a weekly basis;
    b. For drilling activities:
        i. pre-drill seafloor ROV video and survey reports should be submitted to NMA as soon as they are completed;
        ii. reports of effluent discharges, toxicity tests, waste logs should be submitted on a frequent basis, depending on the environmental permit requirements.

2. After completion of the activities:
    a. For seismic activities:
        i. post-survey environmental performance report should be submitted;
        ii. final report detailing marine organisms including marine mammals and turtles sighted should be submitted.
    b. For drilling activities should be submitted:
        i. post-drill seafloor ROV video and survey reports;
        ii. summary report that will consist of actual environmental management performance with reference to the Environmental Management and Monitoring plan objectives and targets;
        iii. Post-monitoring report (this will be requested on a case by case basis by NMA).

The details of compliance monitoring (frequency and parameters of reporting, KPIs, etc.) will be defined in the respective management plan as part of the EMMP.

3.3 Stakeholder engagement

Stakeholder engagement is an integral part of the EIA process that starts during scoping and continues throughout the EIA process and project implementation and beyond. It is the process by which companies communicate and exchange information with their stakeholders. Stakeholder engagement allows companies to better understand the needs and the concerns of the stakeholders, how engaged they are and how the plans and actions of the companies will affect their goals. Stakeholder engagement is of great importance because on the one hand it gives the project proponent an idea of what takes place in the affected communities and among other stakeholders and on the other hand it is the right for the general public to know what a project comprehends and how it can have an impact on them.

3.3.1 Stakeholder Engagement Plan (SEP)

For the SEP the following is important to consider:

- objectives of stakeholder engagement, what is intended to be achieved during which phases of the EIA? Who should be engaged? When and how? When should information be made available? To whom;
- type of engagement per stakeholder group (public meeting, workshop, bilateral meetings, focus groups, key informant interviews, etc.), depending on the objectives of SEP;
- types of materials required (Power Point Presentations, brochures, non-technical summaries of the EIS etc.);
- languages used;
- type of information to be conveyed;
- lists of stakeholders, categorization according to influence and interests;
- roles and responsibilities for e.g. coordinating and leading public meetings;
- formal grievance mechanisms enabling stakeholders to voice concerns and get them addressed in a timely and effective manner;
- data recording and data management (consultation logs, data bases, etc.);
- budgets, timelines and organizational logistics;
- means of dissemination of the draft scoping report or EIS for consultation (electronic and/or paper copies, etc.) and advertising (newspaper, broadcasting, etc.);
- ensure sufficient feedback to stakeholders and provide adequate response to concerns raised and observations made;
- what to do in conflict situations, mediation techniques as appropriate.

A SEP should be submitted as part of the scoping application and should be updated during the scoping process. The updated SEP needs to be available for the EIA phase to include stakeholder engagement during baseline data collection and review of the draft EIS. A third update of the SEP should be provided as part of the EIS regarding post-EIS stakeholder engagement, i.e. during project implementation and beyond.
Requirements for stakeholder identification and analysis should include consideration of vulnerable groups.

3.3.2 Stakeholder engagement process

Consultations on the draft scoping report and the draft EIS should focus on ensuring that participants understand the content of the report and generally accept the validity of the findings of the process so far, e.g. results regarding the selection of receptors, approach to baseline data collection, the resulting impact assessment and the identification of mitigation and management measures. Although stakeholder engagement is a continuous process in the EIA, three phases are of great importance during this process:

- The Scoping phase: During this phase, the public can give their opinion and express their concern about what can be of importance to include in the final Scoping report. The meeting(s) should be held within 10 days after submitting the scoping application.

This because comments and approval from NMA will only follow after the stakeholder meeting(s);

- The Assessment phase: during this phase, the social baseline survey, if necessary, will be conducted, in which contribution of important stakeholders (e.g. fishermen) is relevant for the research team. Local stakeholders can also supply important information on other research areas;
- The Review phase: it is important that the public is aware of the outcome of the EIS, so they can also give their views on this. During the review phase, the project proponent is responsible for the following:
    - The Organizing of public hearings or stakeholder meetings. Here the results must be presented in an understandable manner. The public hearings should be organized after the draft EIS has officially been submitted to NMA. The announcement for public hearings and availability of the EIS for public review should be done simultaneously and at least 14 calendar days before the scheduled meetings. The time period for the public to review the draft EIS is between 30 and 90 calendar days, depending on the complexity of the project. This is also included in the Guidance Note EIA process;
    - Distribution of copies of the Non-Technical Summary to the affected groups, local government authorities, other relevant government authorities, NGO's and other interested parties;
    - Comments by stakeholders must be addressed in the final EIS in a register (table of concordance), which clearly shows which and how comments were addressed and a justification why others were not. NMA's comments should be addressed also but in a separate table of concordance. The format of the table of concordance is included in Appendix D.

As part of the stakeholder engagement process it is also important to take pictures of the stakeholder meetings/public hearings, make audio recordings of the meetings and make attendance lists (which includes name, organization, function, telephone# and e-mail address). This information should also be submitted to the NMA (consideration needs to be given to issues related to privacy rights and data protection).

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APPENDIX A. GUIDANCE ON ESTABLISHING OFFSHORE ENVIRONMENTAL BASELINE AND MONITORING DATA

1 Introduction and Purpose

Environmental monitoring should be undertaken throughout the different phases of offshore oil and gas activities. The scope and frequency of the monitoring program should relate to the expected risk, and hence the program will be less extensive for a single exploration drilling well than for a full field development and production.

Environmental monitoring programs usually consist of baseline surveys prior to any petroleum activities and subsequent follow-up surveys.

Baseline surveys are undertaken to establish the conditions of the existing environment prior to the project being undertaken. The survey findings will support the impact assessment and include potentially existing pollution levels to allow a forecast of the effects and the extent of the effects of envisaged discharges during project implementation. Baseline surveys also assist the design of future monitoring programs.

Follow-up surveys are undertaken to provide information on the nature and direction of any changes and evaluate whether the predictions of the impact assessment have been adequate. The overall purpose is to provide documented evidence to assess the effectiveness of the measures adopted to prevent pollution in the maritime area under consideration.

Key guidance is provided by the OSPAR Guidelines for monitoring environmental impact of offshore oil and gas activities (Agreement 2017-2), hereafter referred to as the OSPAR Guidelines (2017).

In this appendix guidance is provided on the overall monitoring program design and undertaking to ensure consistency between the various surveys with the purpose to:

a) build knowledge on the marine environmental conditions in Suriname;
b) assess potential impacts from discharges of a specific project by comparing the baseline conditions with the monitoring results;
c) compare the results of the various surveys over time;
d) enable a holistic evaluation of potential impacts from the oil and gas developments across the maritime territory of Suriname over time with a focus on spatial and temporal changes of sediment, biological communities and habitats;
e) allow for appropriate measures to be taken in case of unpredicted development of planned and unplanned activities in the long-term.

This appendix refers solely to requirements for offshore environmental surveys related to the reconnaissance and exploration phase, where discharges are limited and temporary. It therefore concerns predominantly baseline surveys and the focus is placed on bottom habitats, which is where the potential effects of exploration drilling might occur. NMA may, however, also request a post-monitoring survey in particular cases.

The Generic Guidelines should be used for other assessments, e.g. associated with onshore ancillary facilities.

To enable a comparison of the survey results, consistency in the design of survey parameters such as sampling station layout, reference station selection, sampling methods and analysis, overall quality control, data interpretation and reporting is vital. Key criteria and requirements for the design and undertaking of monitoring programs are provided below.

2 Quality assurance and quality control (QA/QC)

Quality assurance and control are an essential part of any environmental monitoring program. Environmental monitoring should only be undertaken by contractors accredited for the relevant works. Survey contractors should document that they, or any subcontractor (supplier), are accredited according to internationally accepted standards, such as ISO standards, as accreditation is a means of assessing the competence and integrity of the survey contractor.
All suppliers of services should have a standard QA system implemented, e.g. ISO 9001/9002 or CEMP guidelines on quality assurance for biological monitoring in the OSPAR area (Agreement 2002-15). Overall quality assurance is the responsibility of the proponent, who delegates relevant parts to its contractors. For all areas the survey contractor and all its suppliers should demonstrate that they have established quality control to at least ISO 9001/9002 and follow the relevant guidelines for the relevant type of sampling, sample analysis and reporting. The description should include how and how often QA will occur. This should include participation in relevant inter-laboratory (preferably international) comparison exercises, proficiency testing schemes, procedures to ensure the long-term performance stability, the use of reference materials and appropriate documentation (OSPAR Guidelines, 2017).
Accreditation shall include all aspects of the work from sample collection and analysis to presentation and reporting of the results. All service suppliers for monitoring programs (analysis, fieldwork) should have ISO/IEC 17025:2005 accreditation or an equivalent for the methods they use, whenever an accreditation scheme is available. Suppliers should also document their own quality assurance and control routines. The latest and valid version of the method standards and guidelines should be used, and reference should be made to the year when these standards were established during survey reporting.
Only internationally accredited laboratories should be used for sample analysis. The chemical analysis should be in accordance with international standards and the contractor performing the analysis should participate in proficiency tests. Reference samples should be analyzed together with the samples from the monitoring.
An overview of analytical methods and standards for the various samples, sample methods and analysis is provided in IOGP (2012). NMA requires adherence to OSPAR for sampling and US-EPA methods for sample analysis. In case US-EPA does not cover a particular parameter guidance from OSPAR should be used.
The supplier's quality system should consider a) how the samples will be verified as representative and of good quality, b) planning for reference sample material (reference samples to be run in the same analytical series as the actual samples), c) planning for revision of analytical methods, d) planning for revision of results and e) how will QC of reporting be achieved.
Relevant scopes for accreditations related to environmental surveys (both laboratories and sampling organizations) are within a range of technical fields, these include e.g. acoustics;

geology; chemical analysis; environment; biology; sampling of seabed sediments; sampling seawater (and brackish water).
In general sampling, testing and assessing/interpreting analyses, but also calibration of measuring equipment is covered in two ISO standards, namely ISO / IEC 17025 (accreditation standard for all types of testing and calibration laboratories including sampling and interpretation of analysis responses) and ISO /IEC 17043 (requirements for the accreditation of organizers of comparative laboratory testing).

3 Baseline for seismic surveys

Offshore seismic acquisition takes place over a large area and has an even larger area of influence. Available data on fish stock in the area, fisheries, occurrence of marine mammals and turtles should be compiled and will constitute the baseline.
For seismic acquisition projects a desktop study regarding the EIS is sufficient with the understanding that the most recent data is used for the compilation of the report. The area potentially affected by underwater noise from seismic acquisition should be identified by acoustic modelling to provide input for the impact assessment.
During the seismic operations monitoring should be undertaken consisting of the following:

- Trained MMOs (Marine Mammal Observers) onboard the vessel to monitor marine mammals, turtles and sea birds during day time;
- PAM (Passive Acoustic Monitoring) operators onboard the vessel to complement the MMO observations during night time and periods of poor visibility;
- Reporting of findings and observations (including GPS tracks of the survey vessel, MMO observations, PAM recordings and any mitigation measures implemented during the previous week) to NMA during the survey is required on a weekly basis for review.

See also Chapter 5 for further information.

4 Baseline for exploration drilling

Exploration drilling has the potential for physical, chemical and biological impacts on the marine environment, predominantly due to discharges to sea and physical impacts at the sea floor from e.g. spudding, anchoring and cement works during routine activities.
Currents and other physical parameters may result in a wider distribution of contamination. Exploration is temporary with durations up to 120 days depending on drilling depth and strategy. The magnitude of the impacts depends on the number of wells to be drilled in a particular region, discharge types and volumes, timing issues and other factors.

In the planning phase of exploration drilling there is often limited knowledge of the environmental conditions of the area. The baseline survey therefore needs to be designed in such a way that it provides relevant information on the existing environment in the predicted area of influence and a basis for any post-project monitoring to ensure comparability between

the survey results. Methods for baseline surveys for the exploration (and appraisal) drilling phase include sediment sampling and visual surveys.
The purpose of the visual surveys is to assess if the area is made of hard-bottom substrate or vulnerable bottom habitats (e.g. coral reefs).
Sediment sampling will establish background data for relevant parameters and provide input on the average value of various chemical parameters (i.e. the basis for the Limit of Significant Contamination, LSC).
Furthermore, during the exploration drilling the deployment of MMOs and PAM should be considered, particularly in case of vertical seismic profiling (VSP) being planned as part of the exploration drilling program. See Chapter 5 for further details.
Exploration drilling includes a risk for unplanned events such as a blow-out, which would have much wider impacts. Compilation of primary data during baseline surveys will, however, normally not extend beyond the area of influence of routine activities.

4.1 Sampling program design

The design for a baseline survey related to an exploration drilling program should be part of the Scoping report.
The program must contain a plan for gathering sediment samples from relevant stations at relevant seasons (e.g. to avoid capturing juveniles) including how these samples will be sampled, analyzed for heavy metals and oil compounds (minimum) and analyzed for bottom fauna parameters and indices.
In addition to soft-bottom sampling a plan should be provided on how areas with vulnerable bottom habitats (e.g. coral reefs) and hard bottom substrate will be surveyed visually, as these areas are not suitable for conventional grab sampling investigations. In such case visual surveys may be required in addition, e.g. by the use of ROV (see section 5.1).

Selection of stations

Stations should be selected in a way which allows for the spatial impact of offshore activity to be detected. The station pattern for site specific baseline and follow-up surveys should be identical. They should be determined on the basis of bottom topography, sediment characteristics, current conditions (surface, mid and bottom currents) and other relevant parameters such as anticipated discharge plumes possibly established through dispersion modelling, if available. Areas with a high fraction of silt/clay sediments, where contaminants are likely to accumulate, deserve particular attention.
For the survey design of an exploration drilling program the following should be considered:

- If the spud location is known and the environment is homogenous with respect to sediment type, depth and currents, and where the aim is to assess possible impacts radiating from a source point, a radial transect station design should be chosen. If available, bathymetry and metocean data as well as dispersion modelling results should be used to select stations;

Bottom stations are selected to detect the extent of impact from activity at the fields. These stations should be placed surrounding the spud location as an axis where one of the arms points in the direction of the main current.

- If the spud location is unknown at the time of the first survey, a grid of stations around the expected location may be used. The stations are placed in an axis with increasing distance, typically at 250m, 500m, 1000m and if necessary 2000m. If possible, the nearest station should be closer than 250 m, however due to safety and practicality, this may not be possible. The outermost stations are meant to detect the outer limits of the impact area. Therefore, if the outer station in any direction is contaminated/affected a new station should be established further out in the next round of monitoring (if any);
- For blockwide sampling with drilling locations being unknown at the time of the baseline survey design, a stratified random sampling approach is recommended, particularly for areas of expected homogeneity such as abyssal or alluvial plains. The approach should consider subdividing the block into relatively equal-sized and similarly shaped sub-areas with a subsequent allocation of sampling stations using random x and y coordinates within each sub-area to obtain a relatively even coverage of the block. Minimum separation distances should be considered to negate bias and ensure that stations are not clustered within one stratum.

  Particular attention needs to be given to areas of expected inhomogeneity or known or expected environmental features such as reef or hard ground bottom structures. Existing data on bottom types should be considered during survey design, including literature, geophysical, sonar or other surveys undertaken in the wider area. Efforts should be made to sample a representative number of samples of all expected bottom type strata (e.g. soft mud, low relief hard ground or high relief hard ground bottom) relative to their expected occurrence.

  The various bottom types may require different sampling techniques. Sampling efforts including visual survey techniques may need to be increased to capture areas of inhomogeneity adequately.

Once a drilling location is confirmed, the geohazard survey undertaken prior to drilling should confirm that the drilling activities avoid reef structures or other sensitive features such as sponge communities.

Each station should be given a unique designation to be consistently used over time. The same designation must be used on maps, in tables and text.

Statistical tools (power analysis) should be used to allow an estimation of the number of stations required to detect a predefined change in a measured parameter with a certain confidence over a certain number of consecutive surveys. It is highly recommended that such analysis should be considered in the planning of the surveys.

In order to be able to select representative monitoring and reference stations, the number of stations established for a baseline survey should be higher than that expected for monitoring surveys.

Reference stations

The baseline survey should include the identification of an area that is not expected to be affected by future oil & gas activities, but with similar conditions as the area investigated in the baseline survey. Stations in such areas are termed reference stations. Reference stations are often also called regional stations, particularly in countries with established offshore monitoring.
It is recommended to establish at least one reference station (representative of the region/area, but not to be influenced by oil and gas activities) which shall be used from year to year both in the baseline survey and for later monitoring surveys of the (expected) field. Results from the reference stations are to be used as reference values for assessing possible effects observed at nearby field-specific stations, once fields are in production.

Survey timing

In order to facilitate comparison between the state of the environment prior and after an activity, fieldwork for baseline and follow-up surveys should ideally be carried out in the same season of the year.
Sediment surveys should preferably be performed in the appropriate season to avoid problems related to newly settled juveniles of e.g. benthic fauna. These may, at times, dominate the fauna numerically and thus distort the results while their occurrence would only be transitory as natural mortality after settling may be very high. In case of a survey taking place when juveniles are expected, it is important to consider the issue of juveniles adequately when reporting.

Hydrocarbon development projects may take place in various locations with environments from shallow water with mobile sediments to deep, more stable waters with fine sediment. Monitoring needs to be fit for purpose by taking into account local and regional environmental differences and knowledge of predicted impacts.

Sample storage and preservation

Sampling plans should specify the type of container, storage conditions and maximum holding times for each type of analysis. Sample containers should be clean and properly stored to avoid contamination.

Survey vessel criteria

As certain survey types may be influenced by the vessel and equipment used, it is vital that the suitability of the vessel used is properly assessed during survey design. The survey vessel should comply with descriptions given in ISO 16665:2014. The potential for noise interference with PAM should be assessed as appropriate.

4.2 Sediment sampling

Coherent procedures need to be applied to assess the nature and spatial extent of substances discharged including the assessment of patterns of contamination, the rate and direction of any changes to those patterns, and any effects on macro-benthic community structure. The objective is the verification of predicted impacts at individual locations, therefore similar standards and methods have to be applied for baseline and follow-up surveys to obtain comparable data.
Sampling and sample processing in the field should comply with ISO 16665:2014.
Sampling equipment, sample collection as well as treatment and storage of the samples should be in accordance with the CEMP Guidelines for monitoring contaminants in sediments (Agreement 2002-16) and the JAMP Eutrophication Monitoring Guidelines: Benthos (Agreement 2012-12). The JAMP Guidelines for monitoring contaminants in sediments (1997) should also be considered.
In greater water depths (> 500m) or areas with seabed heterogeneity (mixture of rock, stones, gravel and soft sediment) a box corer might be required to achieve the necessary sampling success.
Particular attention needs to be paid to the list of relevant chemicals used in the respective drilling campaign, e.g. the OSPAR lists of relevant chemicals (OSPAR Convention, Annex 2, OSPAR Strategy with regard to Hazardous Substances, OSPAR List of Chemicals for Priority Action, and OSPAR Candidates for Substitution).

Parameters to be analyzed should include those below and follow the procedures/standards as outlined in the OSPAR Guidelines (2017):

Grain size distribution
Including weight of each sediment fraction and reporting on cumulative weight percent distribution for each station, median particle diameter, standard deviation, skewness and kurtosis of the grain size distribution.

Total organic carbon (TOC)
Hydrocarbons and organic-phase drilling fluids following the CEMP Guideline Agreement 2002-16 and specifying the extraction procedure so that the results are comparable, use of appropriate certified reference materials (e.g. CRM 103-100 for PAH contaminated soil) and the detection and quantification limits should be calculated according to the guidelines issued by the ACS Committee on Environmental Improvement (1980).

Chemistry
- Total Hydrocarbon Content (THC);
- PAHs;
- NPDs;
- Selected components of organic phase drilling fluids (if used);

- Metals including Ba, Cd, Cr, Pb, Cu Hg and Zn while following the JAMP Guideline Agreement 2002-16.

Biology

Benthic macrofauna with sampling, sample handling and analysis following the JAMP Agreement 2012-2, Technical annex 2 (soft bottom macro zoobenthos), identification of taxonomic name and number of individuals for all species including taxonomic resolution to species level as a rule as far as feasible. The nomenclature should follow the latest international revisions, e.g. the World Register of Marine Species (WoRMS). Biomass of each species may have to be determined depending on purpose. As the term macrofauna is used inconsistently across countries, it is recommended to analyze and report on two fractions separately per station (one fraction > 1mm and one with 0.5 – 1mm).

An overview over the number of sediment samples and sub-samples recommended to be taken at different types of stations and for different types of surveys is provided below (source: adapted after NEA 2015, as amended in 2020).

Table 2: Overview of the recommended number of sediment samples and sub-samples to be taken at different types of stations for different types of surveys

Analysis parameter	Baseline (and first follow-up) survey	Subsequent follow-up survey	Sample depth	Conservation / sample quantity
TOC/TN	3 samples mixed (a)	3 samples (mixed) from stations where also fauna is sampled	0-5 cm	≤ -20°C (b) 100 g
Grain Size	3 samples mixed (a)	3 samples (mixed) from stations where also fauna is sampled	0-5 cm	300 g
Total Hydrocarbons (THC)	3 samples 1 sample 1 sample	3 samples 1 sample 1 sample	0-1 cm 1-3 cm 3-6 cm	≤-20°C (b) 300 g
PAH, NPD	1-2 samples	1-2 samples	0-1 cm	
Organic-phase Drilling Fluids			0-1 cm	≤-20°C(b) 300 g
Metals: Ba (c), Cd, Cr, Cu, Pb, Zn, As, Hg	3 samples	3 samples	0-1 cm	≤-20°C (b) 50 g
Benthic fauna	10 samples	10 samples		10 % formalind) Rose Bengal / Eosin

[a] Mixed sample from three grab samples collected at each station.
[b] As described in EN ISO 5667-19:2004 and EN ISO 16665:2013
[c] And/or similar main component in weighting agent (i.e. ilmenite contains Ti)
[d] Formalin may be replaced by less harmful fixative fluids when testing of these has been undertaken.

The sampling should be undertaken using an appropriate grab type, e.g. box corer with a predefined sample area and sampling depths as outlined in the table above and including an appropriate number of replicates (e.g. 3 replicates for chemical analysis and 3 for benthos analysis).
Documented procedures should be implemented to record successful and unsuccessful grabs for sampling in a log submitted as part of the baseline report as this may be relevant for future sampling design.

Statistical analysis

The statistical analyses of the monitoring data will depend on the type and purpose of the investigation.
A minimum requirement for the general description of individual parameters and stations should be that average values are adjoined by summary statistics such as min., max. and SD or SE. The analysis should follow the OSPAR Guidelines (2017). Consideration should also be given to whether the data consists of different sub-sets, indicating the presence of sub-region. This can be done by undertaking a principal component analysis (PCA).
Numerical analysis of bottom fauna data should comprise both univariate and multivariate methods. Statistical analyses should be performed on the entire set of benthos data. Newly settled juveniles of benthic species may at times dominate the macro-fauna numerically, but due to heavy natural post-settlement mortality, such dominance must in many cases be regarded as transitory and not as an indicator of the prevailing conditions. Should juveniles appear among the ten most dominant organisms in the data set, the statistical analysis should be conducted both with and without these in order to evaluate their importance. Differences in fauna structure between reference stations and field specific stations should be assessed by researchers skilled in statistical interpretation of benthic community data, and with emphasis on the multivariate analyses. All results should be standardized to a sediment surface area of 0.5 m². A general overview of suitable statistical methods is given by e.g. Gray et al. (1988).

Research cruise report

During all sampling surveys, a log should be established of the number of successful and unsuccessful sampling attempts at each sampling station, as this may be relevant for future sampling design.
The following conditions of the sediment should be monitored during the survey:

- Visual description of the sediment surface (e.g. empty shells, debris, etc.);
- Sediment description and stratification of layers;

- Presence of large and/or conspicuous fauna;
- Sediment color (e.g. using the Munsell Soil Color Chart System);
- Smell (e.g. H_2S or oil).

During the cruise a thorough report should be kept containing all relevant information on the survey. The cruise report should be written by hand with a pencil, and the use of an eraser prohibited. Any errors should be marked with date and initials and corrected on the side of the erroneous text.
The journal should contain the names and roles of participants, start/end of cruise and vessel name. For each day the weather conditions (including wave height, tidal conditions, wind direction & strength) should be noted. The start time of a new station, coordinates, equipment used, number of times grab samples were attempted and how many (and why) were unsuccessful and dismissed. Guidelines for approval or rejection of samples are provided in ISO 16665:2014.

5 Additional investigations

In addition to sediment sampling other investigations should be considered depending on project location, sea floor characteristics and expected habitats and project specifics. It is the proponent's responsibility to assess the need for additional studies such as metocean data collection or visual surveys. Particular focus should be given to nearshore waters or areas of expected or known vulnerable species or habitats e.g. nature reserves and Multiple Use Management Areas (MUMAs).

5.1 Visual survey

The deployment of visual observation equipment (ROV or towed observation gear) to obtain real time video and still picture footage should follow internationally accepted best practices, e.g. EN16260-2012.
Visual surveys are considered helpful for e.g. supervising sediment sample retrieval, documenting pre-defined transects across areas of expected deposition or areas of heterogeneity in sea floor conditions and biological communities, areas including vulnerable habitats such as corals, sponge communities or spawning areas, or assessing the potential for cultural heritage along sampling stations or transects chosen.

5.2 Marine Mammal Observers (MMO)

MMOs should monitor the survey area visually during daytime, and record any sighting of marine mammals, turtles and other species such as sea birds (i.e. marine fauna observations), while using caution in the interpretation of results.
MMOs should be trained in accordance with the JNCC guideline (2017).

5.3 Passive acoustic monitoring (PAM)

Passive acoustic monitoring should be considered in conjunction with MMO observations to monitor underwater vocalizations of cetaceans. PAM is increasingly used as a tool for monitoring marine mammals during nighttime and poor visibility conditions but PAM and MMO recordings are complementary and simultaneous recording could also be considered.
Specialist PAM operatives are needed to set-up and deploy the equipment and to interpret the detected sounds. The restrictions of current PAM systems regarding seals and some cetaceans (e.g. high frequency cetaceans or baleen whales) should be considered. PAM should be undertaken in line with JNCC (2017).
Caution needs to be taken during the interpretation of the PAM recordings to ensure that noise generated by the survey activities has not masked the results.

5.4 Data interpretation and reporting

It is important that the monitoring data and results are reported in a uniform way and are interpreted in a consistent manner. Reporting should be part of the survey contractor's accreditation and reports should be part of the overall quality control described by the accreditation (e.g. ISO/IEC 17025).
Data reporting should be in accordance with reporting standards such as OSPAR and should be accompanied by information on the methods used, the detection limits, the results of analysis of certified reference materials and any other comments or information relevant to the assessment of the data. In order to establish acceptability of the data, participation in any relevant intercalibration exercises should be reported, where appropriate, together with the dates and results of such exercises, as well as summary information relating to recent control charts, including dates, sample sizes, means and standard deviations.
In addition to internal routines to ensure quality and control regarding data interpretation and reporting, the contractor should have a QA system that complies with the standards described in section 2 of appendix A.
The overall QA system including quality assurance of the various analyses, both in terms of type and frequency, should be presented as part of the method description in the report. The report should include a description on how reference samples were handled. The analyses of station samples should be verified against reference samples run in the same test series, and the results from the reference samples should be part of result interpretation in the report. In reporting the results of replicate samples, it is important to fully describe the replication procedure.
The visualization of exceedances in the reporting of analysis should be undertaken using consistent color coding.
In case of the presence of invasive species these should be clearly identified and reported as such.
The full environmental survey report as well as all raw data collated as part of the survey program (e.g. laboratory analysis, video transects and still pictures, GPS tracks, MMO observations, PAM recordings, etc.) shall be submitted to NMA in electronic format.

APPENDIX B. GENERAL INSTRUCTIONS CONCERNING LEGAL AND REGULATORY FRAMEWORK IN THE EIS

The goal of the chapter concerning legal and regulatory framework in the EIS is to ensure that the project proponent is fully aware of the applicable regulatory framework in which the activities will be implemented and how national laws and regulations will impact their activities. By analyzing national laws and regulations and identifying relevant obligations the project proponent can ensure the project is in compliance. Compliance within NMA EIA process has become increasingly important and can be seen as the way in which the project proponent in an EIA process can minimize the risk that its activities can be linked to violations of- or non-conformance with national environmental laws and regulations. The applicable laws, rules and standards are likely to have various sources, including: - primary legislation; - rules and standards issued by regulators; - conventions; - codes of practices promoted by industry associations; - internal codes of conduct. They can go beyond what is legally binding and embrace broader norms that exist within the framework of environmental integrity.

The chapter concerning legal and regulatory framework must consist of the following parts:

- **Part 1 - Listing of relevant national legislation:** It is important that the legislation and conventions are cited correctly in the EIS. To make sure this happens the following instructions have been developed. There must be consistency in the use of the following: - The correct publication references and the most recent amendments of the legislation. - The official name and the correct translation of the name of the acts in the Report. For example: 'Besluit Mijnbouwinstallaties S.B. 1989 No.38 (State Decision on Mining Installations S.B. 1989 No.38). - The official citation method for Surinamese legislation: (e.g. [Name of Act], [original publication reference], if there is an amendment [z.l.g. bij] [as amended by] [publication reference]. The official publication reference for Surinamese legislation is: S.B. or G.B. [year of publication], [no. of publication]. For example: 'Grondwet van de Republiek Suriname S.B. 1987 no.116 z.l.g bij S.B. 1992 no.38 (The Constitution of the Republic of Suriname S.B. 1987 no. 116 as amended by S.B. 1992 no. 38)'.

- **Part 2 - Listing of relevant international conventions ratified by Suriname:** It is important to list the official name of the conventions and also if and when Suriname ratified/acceded to this convention. Furthermore, the listing of conventions should include possible obligations that could be of relevance to the projected activities.

- **Part 3 - Identifications of obligations that derive out of the first two parts and the identification of steps:** the identification of steps can be through an obligation table if available. With support of this last part the project proponent can ensure that the activities which will be listed in the EMMP have also adhered to the regulatory requirements and obligations in regard to the activities to be considered.

APPENDIX C. FORMAT SCOPING APPLICATION

SCOPING APPLICATION

Date	
Name of the project	
Name project proponent	
Contact person	
Name	
Phone number	
Email address	
Location, site characteristics, design, scope and duration of the project (GPS coordinates)	
Non-technical explanation and purpose of the project	
Need and justification of the project	
Detailed site plan and a map of the project	
Annex 1	**Scoping report**
Annex 2	**Stakeholder Engagement plan (SEP)**

APPENDIX D. FORMAT TABLE OF CONCORDANCE

NO.	PAGE	SUBJECT	NMA COMMENTS	CONSULTANTS/ PROPONENT RESPONSE	REPORT REFERENCE[11]

NO.	PAGE	SUBJECT	STAKEHOLDER COMMENTS	CONSULTANTS/ PROPONENT RESPONSE	REPORT REFERENCE

[11] Reference to the revised section of the report.

APPENDIX E. TIMELINE EIA PROCESS

Phase	Time ([working] days)	Remarks
Scoping phase		
NMA Review Scoping Report (ToR)	14	
Revisions by Project Proponent for the Scoping Report	n.a.	The allocated time is the responsibility of the project proponent
NMA decision on Scoping Report	7	
Assessment phase		
EIS Assessment and Compilation	n.a.	Depending on the scope of the project. (responsibility project proponent)
Revisions Draft EIS	n.a.	Time depends on project proponent
Review Final EIS	30	- This can take up to 30 days - Firstly, a softcopy of the revised document (Final Draft EIS) can be sent to NMA - In case there are still uncertainties they will be discussed with the consultant/project proponent - After this the FINAL EIS (hardcopy and softcopy) can be sent to NMA - The conditions for the Final EIS are compiled
Decision-making		
Decision regarding Final EIS	n.a.	- The conditions for the Final EIS are sent to SHI N.V. - The environmental permit for the project is sent to the proponent
Total processing time within NMA for the different phases	81-141	- Maximum of 81 days for regular projects - Maximum of 141 days for complex - Projects

Disclaimer:

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