



الدليل الإرشادي الفني لمتطلبات دراسة تقييم الأثر البيئي ووثيقة الشروط المرجعية ونطاق العمل للدراسة لمشاريع التطوير الساحلية والبحرية

Technical Guidance on the Requirements for
Environmental Impact Assessment Study (EIA) and its
Terms of References & Scope of Works (ToR & SoW) For
Costal and Marine Developments Projects



It's important to clarify that this Technical Guidance (TG) does not aim to offer specific, detailed instructions for recommended methodologies. Instead, it presents overarching concepts and considerations applicable to the diverse surveys typically employed in environmental impact assessment studies. The methods outlined herein are not exhaustive. Consequently, the competent authority, MECC, retains the right to supplement or revise this TG as deemed necessary.

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List of Abbreviation

Abbreviation	Definition
CEMP	Construction Environmental Management Plan
DEMP	Decommissioning Environmental Management Plan
EC	Environmental Consultant
ECP	Environmental Compensation Plan
EIA	Environmental Impact Assessment
EP	Environmental Permit
EPA	Environmental Permit Application
MECC	Ministry of Environment and Climate Change
NOC	No Objection Certificate
OEMP	Operation Environmental Management Plan
PP	Project Proponent
SEA	Strategic Environmental Assessment
TG	Technical Guidance
ToR & SoW	Term of Reference and scope of Work

1. Introduction

This set of technical guidance, denoted as TG, represents a pivotal component within a comprehensive compilation carefully crafted by Qatar Ministry of Environmental and Climate Change (MECC). The overarching purpose of this compilation is to provide invaluable assistance to a diverse audience, including both government entities and non-governmental project proponents (PP) and consultants which is responsible on conducting Environmental Impact Assessment (EIA) on Coastal and Marine project. At its core, the compilation serves as a guiding framework, offering a meticulously structured set of guidelines specifically tailored to facilitate the particular and effective execution of Environmental Impact Assessments (EIAs).

Designed with a focus on large-scale Coastal and Marine projects, the TG encapsulates a wealth of knowledge and best practices essential for navigating the complexities inherent in Coastal and Marine environmental impact evaluations. The primary objective of TG is to institute a consistent, transparent, and standardized approach to the EIA on Coastal and Marine projects. By doing so, it establishes guidance that promotes uniformity and clarity, essential elements for ensuring the reliability and credibility of the assessment process.

While the nature and details of projects may inherently vary, TG emphasizes the paramount importance of adherence to these guidelines across the spectrum of Coastal and Marine EIAs.

This emphasis on conformity ensures that the assessment process maintains a uniform and rigorous standard irrespective of project specifics. In essence, TG sets forth a blueprint for conducting EIAs that

transcends the diversity of projects, providing a reliable and robust foundation for evaluating environmental impacts associated with large-scale infrastructure endeavors. Through the adherence to this guideline, the compilation strives to foster a culture of environmental responsibility and sustainable development, informing decision-makers within the broader landscape of project planning and implementation.

2. Objective of this TG

This guide is fundamentally aimed to ensure the preservation of the environment through the active promotion of thoughtful consideration for designs, options, and alternatives that are environmentally friendly. Its overarching objective is to anticipate and prevent any adverse environmental consequences that may arise during the various stages of the designated project's entire life cycle. By encouraging a proactive approach, the guide endeavors to shape pivotal decision-making processes, fostering a sustainable and ecologically responsible trajectory for the project. It places a strong emphasis on adopting sustainable practices that not only mitigate potential environmental impact but also contribute positively to the overall well-being of the public health. Through its comprehensive perspective, the guide aims to instill a sense of environmental stewardship, guiding decision-makers in making choices that align with long-term ecological sustainability.

3. Definitions of an EIA report

3.1. Environmental Impact Assessment (EIA):

The Environmental Impact Assessment (EIA) process serves as a systematic and comprehensive tool employed to scrutinize the potential environmental consequences of a proposed project or development. The overarching objective is to accurately identify and evaluate both the favorable and adverse impacts on the environment that may ensue if the project moves forward. By conducting this assessment before the actual initiation of the project, the primary aim is to gain a thorough understanding of the implications the development may have on the surrounding ecosystem.

The EIA process involves a rigorous examination of various factors, ranging from air, noise and marine water quality, marine flora and fauna, water circulation and flushing, chemical, physical and biological component of marine environment, hydrodynamic modelling, marine habitat and socio-economic considerations. Through this in-depth analysis, the goal is to provide decision-makers and stakeholders with a holistic view of the potential consequences associated with the project. This includes not only the immediate and direct impacts but also those that may manifest over the long term.

Furthermore, the proactive nature of the Coastal and Marine EIA stresses its significance in guiding project planners and developers toward adopting strategies that mitigate, alleviate, or even eliminate identified adverse environmental effects. Simultaneously, it offers an opportunity to explore and enhance positive impacts, fostering a

balance between the project's objectives and the preservation of the environment.

The core of the Coastal and Marine EIA lies in its commitment to informed decision-making, environmental protection, and the promotion of sustainable development. By providing a comprehensive overview of the potential impacts, EIA ensures that project proponents, regulatory bodies, and the public are equipped with the necessary information to make choices that align with environmental regulation, conservation, and the broader goals of sustainable growth.

3.2. Term of Reference and Scope of Work (ToR & SoW) For EIA:

The ToR & SoW serves as a comprehensive guide, outlining the scope and context of the EIA. This includes a clear definition of the study area, both geographically and thematically, establishing the boundaries within which the assessment will take place. The ToR and SOW also specifies the goals and expectations of the assessment, providing a roadmap for the entire evaluation process. It outlines the methodologies to be employed, data requirements, and criteria for determining the significance of environmental impacts.

The Term of Reference and Scope of Work (ToR & SoW) represent a foundational document serving as a contractual agreement between the project proponent and the ministry (MECC), outlining the specific aspects to be scrutinized in the Environmental Impact Assessment (EIA). This document delineates the precise components and parameters to be addressed in the EIA, encompassing details such as

the methodology, duration, and frequency of surveys and samples. Additionally, it establishes the regulations governing the assessment process. The ToR & SoW functions as a comprehensive guide, providing a detailed framework for the EIA's scope and context. This involves a clear definition of the study area, both in geographical and thematic dimensions, setting explicit boundaries for the assessment. Furthermore, these documents articulate the goals and expectations of the assessment, essentially crafting a roadmap that directs the entire evaluation process. In essence, this foundational document ensures a systematic and standardized approach to the EIA, offering a robust framework aligned with established regulations and expectations.

4. General Requirements

- a. All communications, correspondences, reports, etc. with/to MECC- ENVIRONMENTAL AFFAIRS shall be through the Competent Authority.
- b. The Project Proponent (PP) shall submit an application for Environmental Permit (completion of Form with all the required information and documents and submission of Form to MECC- ENVIRONMENTAL AFFAIRS via the Competent Authority).
- c. The EC visit the project site and surrounding area to understand the type of sensitive receptors.
- d. The EC shall prepare a detailed ToR & SoW document for the EIA study satisfying the requirements of MECC- Environmental Affairs. The PP shall obtain approval of the prepared Scope of Work for the EIA from MECC- Environmental Affairs.

- e. The detailed ToR & SoW for the EIA shall be prepared and submitted as one document comprising all the related environmental aspects and issues.
- f. The EIA report shall be prepared and submitted as one document comprising all the required environmental aspects and issues.
- g. The detailed ToR & SoW for the EIA study should include, but not limited, and define to the greatest extent the relevant elements stated below:
 - i. Contain early description of the environment likely to be affected by the project / activity, including the natural, social, historical, cultural and economic elements of that environment, as much as applicable. A detailed map/drawing, minimum A3 size, shall be provided.
 - ii. Specify and discuss the types / range of alternatives and mitigation measures in carrying out the EIA and justify selecting these alternatives and measures. The ToR & SoW for the EIA should cover both alternatives to the proposed project / activity (including no development option), and alternative methods of carrying it. The range and types of alternatives and mitigation measures should reflect potential environmental impacts, possibilities for mitigation, and results of consultation (e.g. drainage alternatives (connect to an existing sewer network, evaporation pond, discharge to the sea, soakaway, etc.)).
 - iii. Identify all the regulations, bilateral and international agreements, protocols and conventions and the guidelines, standards and limits that need to be taken in consideration within all project's phases and seeking the MECC-

ENVIRONMENTAL AFFAIRS approval on it. These should be elaborated in detail in the EIA study.

- iv. Provide project's completion plan summary from start through construction. The plan shall identify all concerned/interested parties that required consultation with and/or approval from.
- v. All submissions to MECC- ENVIRONMENTAL AFFAIRS shall be provided in hard and soft copy. The soft copy shall be an editable and unprotected digital copy (word, excel, power point, etc.) of the report and all its attachments. Copy from the used regulation/ limits/ standards/ etc. used as references (other than locals) should be provide to MECC- ENVIRONMENTAL AFFAIRS as a part of the EIA report. All studies, report, action plans, etc. shall be conducted according to MECC- ENVIRONMENTAL AFFAIRS's regulations & guidelines. Other regulations & guidelines shall be approved by MECC- ENVIRONMENTAL AFFAIRS prior to using them.
- vi. Identify additional regulatory approvals that may be required to complete the proposed project / activity.
- vii. Identify any government policies that may need to be addressed while carrying the EIA.
- viii. Outline the plan for completing the EIA, including sources of data collection, summary and brief description of any baseline and other studies that are needed, and other information and issues that considered relevant.

- ix. Detailed Scope of Works (SOW) for all the environmental information needed/ required to conduct the EIA study should be developed and included in the submitted (EIA's ToR & SoW) document.
 - x. Describe the methodology to assess the impact generated from/ by the project on the surrounding environment (e.g., modeling, simulation, etc)
 - xi. Identify / describe key decision-making milestones during the preparation of the EIA.
 - xii. Provide program for carrying out the EIA, including an estimated start date, and dates for any milestones or decisions.
 - xiii. Identify reports to be submitted to MECC-ENVIRONMENTAL AFFAIRS, which shall include both hard and soft copies of the reports and the data collected.
 - xiv. Identify any future environmental plan to be prepared and submitted, when and by whom, including the methodology, time frame and the responsible party and the concerned party(s).
 - xv. Address Construction Environmental Management Plan (CEMP)'s including all the related plan and program (e.g. monitoring program).
 - xvi. Address Operation Environmental Management Plan (OEMP)'s including all the related plan and program (e.g. monitoring program).
- h. The EC shall prepare the Environmental Impact Assessment (EIA) study upon approval of the detailed ToR & SoW by



MECC- ENVIRONMENTAL AFFAIRS. The exact format of the reports shall be submitted as a part of the EIA's ToR & SoW.

- i. The detailed ToR & SoW of the EIA study shall include, investigate, collect data, analyze, assess and identify quantitatively the impact of the project to the all, but is not limited to, the following environmental aspects. These aspects shall be integrated into the design options and geotechnical investigations, where applicable.
 - i. Atmospheric air quality
 - ii. Ambient air quality (include modeling the impacts).
 - iii. Noise and vibration (include modeling the impacts).
 - iv. Terrestrial Ecology (flora and fauna) walkover surveys of the project area. The survey shall be extended to a minimum of 150m beyond the project area.
 - v. Topography, geology, soils and contamination, including the soil sampling, testing and analysis, as per Clause 2
 - vi. Surface and Groundwater, hydrology/ hydrogeology and contamination
 - vii. Socio-Economics.
 - viii. Cultural heritage and archeology.
 - ix. Marine environment ecology and water quality (as applicable).
 - x. Waste Management.
 - xi. Landscape and visual impact.
 - xii. Accident and incident.
 - xiii. Effect on sensitive receptor including human and fauna.

- xiv. Social Impact Assessment.
- j. The EIA report shall include all, but is not limited to, the following:
- i. Recommendation of options and measures to be taken for the design project.
 - ii. Recommendations for mitigation measures and environmental option solutions such as noise barrier, fauna crossing, relocation of ecosystem, etc. outlining the integration of different sectors and included in the construction environmental management plans.
 - iii. The evaluation of environmental monitoring data and analyses shall be presented in Graphical and Interpretative format within the submitted report.
 - iv. The data collected and analyzed from the approved monitoring program.
 - v. CEMP's and OEMP's framework, all the related environmental and occupational health and safety aspects and issues, mitigation measures, conclusion, recommendations, table of content, responsibilities for each party, etc. should be developed in detailed within the EIA's report.
- k. The proposed environmental studies shall be prepared to comply with the requirements of the Environmental Assessment process of Qatar as laid down in the Decreed Law No 30, 2002 for the protection of the environment and its executive Bylaw and the MECC- ENVIRONMENTAL AFFAIRS requirements.



- l. The EC shall carry out technical investigations for air quality, and noise impact, soil and ground water as per TG, in order to propose concept and undertake quantitative modeling. This shall be included in all design options indicating the source of pollution, type of impact, the receptors and location of impact including land use and different peak time periods.
- m. If the assessment of the impact to the coastal/marine environment is required (e.g., drainage (discharge to the sea)), it shall be identified and added as an addendum to the approved detailed ToR & SoW of the EIA and addressed in detail in the EIA study. The following steps shall be followed:
 - i. Detailed assessment based on available related information shall be conducted and mitigations and recommendations be set.
 - ii. If the related information is not available or not sufficient, then the assessment shall be conducted based on what is available (as much as quantitatively possible) and a detailed ToR & SoW for the collection of the required data/ investigation and the impact study on the marine environment shall be prepared and submitted as an appendix to the EIA study report. Approval on this ToR & SoW shall be obtained from MECC- ENVIRONMENTAL AFFAIRS.
- n. All environmental investigation site works, monitoring, sampling, testing, laboratory testing and factual reporting shall be undertaken by EC(s) and sub-contractor(s) approved by Qatar General Organization for Standards & Metrology (QGSOM) and engaged by the EC subject to Client's approval.
- o. Deliverables:



- i. All technical submittals shall be in English language. The abstract of the EIA should be submitted in both Arabic & English language.
- ii. All submissions shall be provided in hard and soft copy. The soft copy shall be an editable and unprotected digital copy (word, excel, power point, etc.) of the report and all its appendixes and attachments.
- iii. The EC shall submit One (1) original hardcopy and One (1) softcopy, in PDF format, of the DRAFT EIA's ToR & SoW document (including all the appendixes and attachments).
- iv. The EC shall submit One (1) original hardcopy and One (1) softcopy in PDF, and One (1) softcopy in an editable and unprotected digital copy (word, excel, power point, etc.) formats, of the FINAL EIA's ToR & SoW document (including all the appendixes and attachments).
- v. The EC shall submit One (1) original hardcopy and Six (6) softcopies in PDF format, and One (1) softcopy in an editable and unprotected digital copy (word, excel, power point, etc.) formats of the DRAFT EIA document (including all the appendixes and attachments).
- vi. The EC shall submit One (1) original hardcopy and Six (6) softcopies in PDF and One (1) softcopy in an editable and unprotected digital copy (word, excel, power point, etc.) formats, of the FINAL EIA document (including all the appendixes and attachments).

5. Specific environmental Aspects

All the specified surveys mentioned below necessitate the use of updated methodology, comprehensive consideration of parameters/aspects, justifiable types, and durations (accounting for seasonality variation), and adherence to site section criteria and representative sampling.

5.1. Marine Ecology baseline

This section provides the minimum requirements for marine ecology that shall be addressed within the ToR & SoW report and subsequently assessed in detail in the EIA. The scope shall include flora and fauna composed of bacterial phytoplankton, zooplankton, benthic organism coral, seagrass, shellfish, fish, mangrove, wetland, and other aquatic biotas: The following are minimum vital surveys for SOW/TOR to be considered but not limited to.

- i. Habitat Identification and Classification: Drop-down Video shall be conducted from the survey vessel in multiple locations (via a representative transect) across the larger marine area to record spot videos. These spot videos with sufficient duration, shall be used to identify the marine habitat at each location as well as any fauna and flora encountered during recording.
- ii. Sensitive Habitats (Coral, Seagrass, and Macroalgae): Wet Self-Contained Underwater Breathing Apparatus (SCUBA) videography surveys to be conducted at sensitive habitat locations to assess each component (coral formation or seagrass bed) along with identification of all benthic flora and fauna to species level where possible.



- iii. Seagrass Biomass Survey: A photo-quadrat survey to be undertaken at each of the seagrass biomass sample sites and each site, representative numbers of 20m x 20m quadrats shall be photographed as well as gather qualitative information such as sediment type and any disease present.
- iv. Fish and Shellfish Population: Underwater Visual Census (UVC) for fish and shellfish to be conducted across a 50 m section of each transect corridor to 5m above the benthos or to the surface, whichever was most distant.
- v. Marine (Benthic) Infauna: Marine (benthic) infauna samples to be collected in duplicate from each of the locations (same as those used for the sediment quality analysis)
- vi. Marine Mammals and Reptiles: Underwater diver observations, video analysis and incidental observations of marine mammals and reptiles were recorded throughout the duration of the marine ecology baseline survey from the survey vessel and by diver.

5.2. Marine Water Survey.

The ToR & SOW shall provide a comprehensive survey methodology to collect representative marine water quality data to characterize the Marine Water Baseline. The parameters shall at minimum cover those listed in Annex 3/4 of the Bylaw No.4 of 2005. The survey methodology, sampling, and analysis shall include but not be limited to the following areas:

- a. In-situ water quality measurements using calibrated equipment.
- b. Ex-situ water quality samples for chemical characteristics at justified representative locations, and
- c. Water clarity (transparency) measurements, undertaken using a Secchi disc, were also recorded at each location during sample/reading collection.

5.3. Bottom Sediment.

This section shall also characterize bottom sediment in terms of physical, chemical, and microbiological properties and constituents including but not limited to parameters such as particle size, pH, organic contents, nutrients, sulfide, and toxic substances such as heavy metals pesticides and antifouling paints (Parameters analysis shall be conducted to internationally recognized standards for sediment characterization (e.g., New Dutch, USEPA...etc.), where relevant). The scope will not only propose number of sediment samples that should be collected but it will also elaborate their representativeness, number, location, depth, duration and frequency among other aspects. The scope will also laydown how the EIA examining these project influence on established physical, chemical, and microbiological attributes. This section shall provide a holistic baseline to aid understanding of the sediment composition and characterization (particle size, contaminant measures, geotechnical testing) allowing for a nuanced analysis that considers both the physical, chemical, and biological aspects. This multifaceted approach ensures a comprehensive scope, contributing valuable insights into the



environmental characteristics and facilitating informed decision-making based on a robust dataset. The scope shall also encompass maps of adequate size, not less than A3, to delineate selected locations.

6. Soil, Groundwater, and Geology.

This section provides the minimum requirements that need to be addressed for the soil and groundwater within the ToR & SoW of the EIA study.

1. Internationally accepted code of practices shall be defined within the ToR & SoW for the following activity:
 - a. Site assessments/ investigation.
 - b. Soil and groundwater sampling.
2. Parameters analysis shall be conducted to internationally recognized standards for both soils and groundwater (e.g., New Dutch, USEPA), where relevant. Where these standards do not provide limits for certain parameters, other appropriate internationally standards shall be suggested and adopted for comparison upon MECC-ENVIRONMENTAL AFFAIRS's approval.
3. The following shall also be provided:
 - a. Sampling locations for soil and groundwater.
 - b. Parameters to be analyzed.
 - c. Samples' depths.
 - d. The total depth of the boreholes.
4. A3 size colored map showing the suggested sampling locations and a list of GPS coordinates shall be provided.

5. Analyzing methodology to be followed (device/ method, detection limit, etc) should be provided.
6. Reference points used for comparison.
7. The EC should make an integrated testing program to plan the environmental soil & and groundwater investigation by obtaining soil and water samples for environmental tests (one location per hectare of the project/ package's area (five (5) locations as a minimum)) while conducting geotechnical investigation including boreholes and test pits from geotechnical investigation works. The EC shall undertake the required tests for each package including, but not limited, the following items:

For Soil:

- i. Organic compounds
- ii. pH
- iii. Major nutrients - nitrogen (N)
- iv. Phosphorus (P)
- v. Potassium (K)
- vi. Secondary nutrients – e.g. sulphur
- vii. Calcium
- viii. Magnesium,
- ix. Minor nutrients – e.g. iron, manganese
- x. Heavy Metals: Copper, Chromium, Cadmium, etc
- xi. Zinc
- xii. Boron

- xiii. Aluminum
- xiv. Mercury
- xv. Lead
- xvi. Soil organic matter
- xvii. Moisture content
- xviii. TPH (DRO, GRO and Heavy Fraction, etc)
- xix. VOC and BETX
- xx. Total Coliform, Fecal Coliform and Egg Parasites.

For Groundwater:

- xxi. Organic compounds
- xxii. pH
- xxiii. Major nutrients - nitrogen (N)
- xxiv. Phosphorus (P)
- xxv. Potassium (K)
- xxvi. Secondary nutrients – e.g., sulphur
- xxvii. Calcium
- xxviii. Magnesium,
- xxix. Minor nutrients – e.g., iron, manganese
- xxx. Heavy Metals: Copper, Chromium, Cadmium, etc.
- xxxi. Zinc
- xxxii. Boron

xxxiii. Aluminum

xxxiv. Mercury

xxxv. Lead

xxxvi. Electrical conductivity

xxxvii. TPH (DRO, GRO and Heavy Fraction, etc)

xxxviii. VOC and BETX

xxxix. BOD5-20

xl. COD

xli. Total Coliform, Fecal Coliform and Egg Parasites.

8. The assessment of all types of impact on the soil and groundwater generated from the project (all phases) shall be identified within the ToR & SoW and addressed in detail in the EIA study (e.g. drainage options).
9. Where contamination is suspected at any site the EC shall address the following minimum requirements within the ToR & SoW for the EIA:
 - i. The assessment in this/ such case will examine the size, extent and severity of the soil & groundwater contamination, which shall be undertaken by:
 - Desktop study.
 - Site walkover.
 - Soil and groundwater investigation. The SOW for the investigation of the soil & groundwater shall be prepared according to the requirements stipulated above.



- ii. Five (5) groundwater monitoring wells shall be drilled, collecting soil samples from the boreholes during drilling. Visual and olfactory evidence of soil contamination will be recorded. Collection and analysis of the groundwater shall be sampled from each well. Wells shall be drilled, developed, and left to stand for a few days before sampling to allow conditions in the well to equilibrate with those in the surrounding aquifer.
- iii. The EC shall identify the parameter(s) (physical, chemical and biological characteristics/ contaminants) related to the source/ type of contamination for soil and groundwater to be analyzed accordingly.
- iv. The depth of the boreholes and the number/depth of soil samples per borehole shall be defined.
- v. The groundwater movement (horizontal direction) and the fluctuation (vertical direction) shall be identified, and contour maps shall be presented.
- vi. Results of the soil and groundwater analysis will be compared to applicable local and/or international standards (as per the requirements stated previously). The exceedances in pollutants' concentration, level and extent of contamination shall be discussed and a contour map shall be plotted.
- vii. The findings, a discussion of the level and extent of contamination and recommendations for remediation/ rehabilitation and/or follow-up work shall be included in the EIA.



- viii. Where contamination is identified/ indicated, the EC shall advice in the EIA report on the key indicators and additional requirements to identify contaminants, the extent of contamination and provide recommendations and solutions to remediate or/and rehabilitate the area and the affected/effected elements. For that a separate detailed SOW shall be prepared as an appendix to the EIA report for future work to be done, which shall include but not limited to the following.
- ix. Adequate/ suitable grid of boreholes shall be established in the contamination area, for comprehensive investigation. Detailed SOW for that should be developed and submitted to MECC- ENVIRONMENTAL AFFAIRS for reviewing and approval prior to any execution of work in the field.
- x. Colored contour maps shall be developed for the contaminates in the soil & groundwater.
- xi. An appropriate dispersion model for groundwater contamination shall be used. This will be used to aid identification of potential mitigation and remediation options for any contamination found.
- xii. Quantitative Risk Assessment (QRA) study shall be conducted to identify the need of site (soil/ groundwater) clean-up/ remediation/ rehabilitation.
- xiii. Upon the result (conclusion and recommendation) of the QRA, different options of site (soil/ groundwater) clean-up/ remediation/ rehabilitation shall be discussed and assessed and then ranked based on all the related aspects (cost, efficiency, time, etc.)

- xiv. Checking for the presence of a floating layer of oil on the water surface (groundwater) using an interface probe.
- xv. The groundwater movement (horizontal direction) and the fluctuation (vertical direction) should be identified, and cantor maps should be drawn.

7. Air Pollutions and Ambient Air Quality

- a. This section provides the minimum requirements that need to be addressed for the ambient air quality within the ToR & SoW of the EIA study.
- b. The EC shall provide assessments of the project and identify the sensitive receptors including air quality investigation to reduce negative impacts from the project. The air quality monitoring shall measure air pollutants, including but not limited to the following, over a period based on the potential health effects of air pollutants and MECC- ENVIRONMENTAL AFFAIRS requirements:
 - suspended particulates (PM10)
 - carbon monoxide (CO)
 - ozone (O3)
 - nitrogen oxides (NOx)
- c. The EC shall provide baseline data with acceptable international standards (by MECC- ENVIRONMENTAL AFFAIRS) to interpret and justify the outcome of the assessment with the environmental report(s) that complies with the Qatar Decreed

Environmental Law 30, 2002, and its Executive Law according to the following:

- d. Collecting data from the nearest continuous monitoring station, which should be:
- Real-time (continues reading)
 - QA/QC
 - Recently recorded (no more than 12 months)
 - Obtained from no less than a continuous 3-months campaign.
 - For that a briefing should be represented in table form that includes but is not limited to:
 - source of data
 - the monitored pollutant(s)
 - monitoring starting and ending date (dd/mm/yyyy)
 - duration (d)

An A3-size colored map showing the location of the source data with respect to the project site should also be provided.

The data in (b) above should be verified by using passive sampler technique, which should be justified technically (the technique and the verification) by the EC. The sampling shall be in 4 locations and for a continuous period no less than 30 days. The collection of samples shall be in a frequent bass, which define and the monitoring location by the EC (with detailed technical justifications) and approved by the MECC-ENVIRONMENTAL AFFAIRS.

- a. The impact of the project (after completion of construction) and all the related activities (e.g. future traffic) shall be

quantitatively modeled according but not limited to the following:

- I. USEPA-AIRMOD (last version) shall be used. If the EC is proposing to use a different modeling program, the program shall be approved by a recognized national competent authority in UK, Germany, etc. and shall be accepted by MECC- ENVIRONMENTAL AFFAIRS.
 - II. All the existing, under construction, permitted, proposed and planned projects within the Project's and the surrounding areas should be taken in consideration with the air quality inventory and modeling.
 - III. The metrological data intend to be used in the model should be QA/QC, from a local station (in Qatar), for the period 10~15 years and not old than 1 year from the study starting date (e.g. 2005-2019).
 - IV. QA/QC Real Vertical Metrological data should be used. Assumptions are not accepted. The missing height in Qatar should also be defined both in summer and winter.
 - V. The time-averaged should be specified based on the adopted national, regional and international regulations; the priority should be for Qatar National Environmental Regulations.
- b. If a monitoring campaign is required by using an Air Quality Monitoring Station/Unit (real-time continues reading) in addition to/replacing of passive sampler technique, the following shall be addressed in addition to the above-related requirements:
- I. The EC shall submit separately for the monitoring campaign which shall be conducted based on continuous recording (real-

time) and by using the approved method for the above parameters. Furthermore, meteorological conditions measuring equipment (wind speed, wind direction, temperature, humidity, etc.) should be included in the same station. The campaign duration should be no less than continuous three months.

II. A comprehensive report for the site(s) selection of the AQMS should be submitted to MECC- ENVIRONMENTAL AFFAIRS for approval prior to any execution of the related fieldwork (the starting time shall be set according to this report). The report shall be developed according to and including, but not limited to:

- Wind-rose diagram showing the predominant wind direction in the area, which should split in months (separate diagram for each month). For that, 10~15 years of metrological data should be used and not old than 1 year from the study starting date. The wind-rose diagram should split in months (separate diagram for each month)
- Sources of pollution in the area including, but not limited to power plants, traffic, industries...etc.
- Ranking criteria for the selection of AQMS
- Detailed technical justification for the selected AQMS techniques.
- The Pollutants' Max Ground Level Concentration (Max GLC) contour line should be drawn and the concentration on the sensitive recaptures shall be indicated separately for the:
 - Current situation.



- Current situation, and all the existing, under construction, permitted, proposed, and planned projects with the affected and affected area.
- The Project impact in addition to the above.

8. Noise and Vibration

- a. This section provides the minimum requirements that need to be addressed for the noise and vibration within the ToR & SoW of the EIA study.
- b. The EC shall provide the noise baseline condition, identify the sensitive receptors and assess (quantitatively) the impact of the project and set the mitigation measures to prevent/ minimize to the acceptable level the noise impacts of the project. The assessment shall be supported by appropriate modeling works as approved by MECC- ENVIRONMENTAL AFFAIRS. The SOW shall include but not limited to the following:
- c. Internationally accepted code of practices shall be defined for the investigation, data collection and analysis, in addition to Qatari national guidance and standards, where appropriate.
- d. The baseline noise levels shall be obtained using precision integrating sound level meters conforming to Type 1 specification and related standards.
- e. The monitoring (measurements) shall be conducting day and night, during a working day and weekend (Friday and Saturday). The day, time and duration should be stated.
- f. A3 size colored map showing the suggested monitoring locations, the location of the sensitive receptors and list of GPS coordinates should be provided.

- g. The noise and vibration contribution from the project activities shall be added to the existing ambient noise levels in order to determine the cumulative impact on all recipients. Quantitative assessment of noise emissions from the project's activities shall be undertaken, and sound levels at the sensitive receptors will be predicted using an advance modeling technique. The result shall be compared with applicable noise limits.
- h. Noise and vibration impacts generated from construction activities shall be assessed quantitatively in accordance to adopted standards.
- i. Operational noise levels shall be calculated, modeled and simulated by a computer model related to the type of the project/ source of impact. A 3-dimensional model shall be used with digitized inputs that related to the project type/ source of impact (e.g., barriers, buildings).
- j. As per the Law 30/ 2002 and its Executive Order, the noise level should be calculated as an average of 10 min readings (Leq 10min).
- k. The monitoring period at any station (spot) should be continued for no less than 30 min.
- l. The exact GPS coordinate and the description of the Spot should be identified.

9. Coastal and Marine Modelling

Models are essential components in the environmental assessment process as they predict the changes brought about by the planned works and the construction process. Coastal and Marine Models may include but are not limited to Hydrodynamic Modeling (HM), Water Quality Modelling (WQM), Wave Modeling (WM), and Sediment dispersion Modeling (SDM)...etc. For all models, a number of golden rules apply for their use:

9.1. Modelling Scope

- All models shall be based on demonstrated scientific theory or empirically derived relationship.
- Brief overview of each model: Hydrodynamic, Water Quality, Wave, and Sedimentation shall be provided (Arabic/English) to be provided.
- Step-by-step scope of 3D hydrodynamic model: flushing (water exchange/circulation) by the use of conservative tracer and assessment of Water Quality by modeling. Flushing study for the analysis of blockage of the flow of water from temporary and permanent structures compared to present conditions
- Wave Model for the analysis of changes in current patterns.
- Sediment Transport and dispersion modeling and considering realistic transport scenarios.
- Analysis of transport/dispersion levels compared to background sediment concentrations. (Excess concentrations and depositions from spill)

- Summary of key findings and conclusions.
- Recommendations based on the model's results and outcomes.

9.2. Introduction:

- Background information on each model and the problem that should be studied via the models.
- The intent and goals of each chosen model type, along with the technical rationale behind why the selected model is deemed paramount for this undertaking.
- Detailed description of the study area.
- The Boundary Conditions of the study area.
- The geographical boundaries of the study area.
- The boundary conditions for the modeling.

9.3. Data Collection:

- There shall be a comprehensive characterization of the environmental baseline to gain a thorough understanding of the environmental setting and to quantify changes arising from the proposed project.
- The data sources (both secondary and primary) used for the modeling.
- Information on bathymetry data, meteorological data, mesh size justification, etc.
- Pre-processing steps undertaken for the data.
- Evidence on QA/QC checks of all data water, sediment, bathymetry, Metocean and all other input data.

- Evidence of seasonality and worse case/s
- Evidence of representative (water and sediment) sampling numbers and locations.
- Evidence of representative Tide gauge and Acoustic Doppler Current Profiler (ADCP) numbers, locations, and duration.

9.4. Model Spatial Dimension:

- outlined a rationale for selecting a specific model dimension.
- Outline the key features, capabilities, and gaps of the chosen model.
- Among the various model dimensions (1D, 2D, 3D), MECC mandates the use of 3D unless pre-agreed upon during the scoping stage.

9.5. Model Setup:

- The scope shall include a detail setup of the models (hydrodynamic, water quality, wave...etc.), including input parameters.
- All models shall be calibrated using prototype field data and evidence data in terms of representativity and seasonality with QA/QC shall be demonstrated.
- All models shall be validated using totally different data from that used for the calibrated process.
- Any restriction or limitation on the use of the model must be stated when the results of the modeling are given.
- Evidence of simulating both seasonality and worse cases.

- Evidence of simulating before and after the development/the proposed project.

9.6. Results:

- Adequately showcased the models (hydrodynamic, water, dispersion, waves...etc.) results.
- Use tables, graphs, figures, and video simulations to enhance clarity.
- Video simulation of all models visually demonstrating
- Discuss any unexpected findings or limitations.
- Discuss gaps, uncertainties, and assumptions of each model.

9.7. Discussion:

- Interpret the results in the context of the study objectives.
- Address any uncertainties or limitations in the modeling approach.
- Compare model results with available field data, if applicable with evidence of complete statistics data.

9.8. Conclusions:

- Summarize the key findings of the models including but not limited to hydrodynamic, wave water, dispersion ...etc. models. This shall clarify the changes that the project implementation may have on the environment.
- Highlight the implications of the results the environmental, social, and economic perspective.

9.9. Recommendations:

- Recommendations for any further studies, monitoring or actions based on the modeling results.

9.10. References:

- All sources, including relevant literature and data used for the modeling.

9.11. Appendices:

- Include detailed technical information, all model input files, additional figures, or any supplementary material.

9.12. Formatting and Style:

- Ensure the report follows a consistent formatting style.
- Use clear and concise language.
- Include a table of contents for easy navigation.

10. Template for ToR & SoW Table Of Contents:

1. Executive Summary
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 - 2.1. History of Environmental Submissions
 - 2.2. Objectives of the ToR & SoW
 - 2.3. Report Layout
 - 2.4. Contacts
3. Project Description
 - 3.1. Introduction
 - 3.2. Project Proponent
 - 3.3. Project Location
 - 3.4. Existing Site
 - 3.5. Policy Plan, Land Ownership Plan and Road Corridor Plan
 - 3.6. Need for the Project
 - 3.7. Project Components
 - 3.8. Construction
4. Legislative and Regulatory Framework
 - 4.1. National Policies and Legislation
 - 4.2. Environmental Permitting Procedures
 - 4.3. International Commitments
 - 4.4. Local Policies and Plans
 - 4.5. Regulatory Framework for Environmental Topics

5. EIA Process and Methodology
 - 5.1. Spatial Scope
 - 5.2. Temporal Scope
 - 5.3. Consultation
 - 5.4. Assessment Methodology
 - 5.5. EIA Report
 - 5.6. Project Milestones and Program
6. Baseline Conditions, Impact Assessment and Mitigation Measures
 - 6.1. Environmental Issues Scoped-in and Scoped-Out
 - 6.2. Hydrology and Hydrogeology
 - 6.3. Geology and Soils
 - 6.4. Transport and Access
 - 6.5. Air Quality
 - 6.6. Landscape and Visual Impact
 - 6.7. Noise and Vibration
 - 6.8. Waste Management
 - 6.9. Terrestrial Ecology
 - 6.10. Marine Environment
 - 6.11. Marine ecology baseline
 - 6.12. Marine water Quality
 - 6.13. Sediment chemical and physical survey
 - 6.14. Marine modelling
 - 6.15. Socio-Economics

6.16. Archaeology, Culture and Heritage

7. EIA Conducting Timeline.
8. Stakeholder Consultations
9. Framework Environmental Management Plans
 - 9.1. Framework Construction Environmental Management Plan
 - 9.2. Framework Operational Environmental Management Plan
10. Conclusion
11. Reference

11. Template for EIA Table Of Contents:

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 - 3.4. Report Layout
 - 3.5. The EIA Project Team
 - 3.6. Contacts
4. Project Description
 - 4.1. Introduction
 - 4.2. Project Proponent
 - 4.3. Project Location
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 - 4.5. Project Schedule
 - 4.6. Stakeholder Management and Consultation
 - 4.7. Adjacent Projects
 - 4.8. Baseline Conditions
5. Project Alternatives Considered
 - 5.1. Introduction
 - 5.2. No Action (Without Project)
 - 5.3. Location Options

- 5.4. Design Options
- 5.5. Construction Options
- 6. Legislative Requirements
 - 6.1. Introduction
 - 6.2. Authorities
 - 6.3. National Policies and Legislation
 - 6.4. National Guidelines
 - 6.5. International Conventions and Agreements
 - 6.6. EIA Procedures
 - 6.7. Local Policies and Plans
 - 6.8. Other Applicable Standards and Specifications
- 7. Approach and Methodology in the EIA
 - 7.1. Introduction
 - 7.2. EIA process
 - 7.3. Approach and Methodology to Impact Assessment
 - 7.4. Approach to Mitigation and Monitoring
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- 8. Air Quality
 - 8.1. Baseline Assessment
 - 8.2. Impact Assessment Methodology
 - 8.3. Baseline Conditions
 - 8.4. Sensitive Receptors
 - 8.5. Impact Assessment

- 8.6. Impact Significance
- 8.7. Mitigation Measures
- 8.8. Residual Impacts
- 9. Noise and Vibration
 - 9.1. Baseline Assessment
 - 9.2. Impact Assessment Methodology
 - 9.3. Baseline Conditions
 - 9.4. Sensitive Receptors
 - 9.5. Impact Assessment
 - 9.6. Impact Significance
 - 9.7. Mitigation Measures
 - 9.8. Residual Impacts
- 10. Geology and Soil
 - 10.1. Baseline Geology
 - 10.2. Assessment Methodology
 - 10.3. Soil Quality Results
 - 10.4. Impact assessment
 - 10.5. Mitigation Measures
 - 10.6. Residual Impacts
- 11. Hydrology And Hydrogeology
 - 11.1. Baseline Conditions
 - 11.2. Assessment Methodology
 - 11.3. Water Quality Results

- 11.4. Impact assessment
- 11.5. Mitigation Measures
- 11.6. Residual Impacts
- 12. Marine Environment
- 13. Marine Environment
- 14. Marine ecology baseline
- 15. Marine water Quality
- 16. Sediment chemical and physical survey
- 17. Marine modelling
 - 17.1. Assessment methodology
 - 17.2. Baseline conditions
 - 17.3. Impact Assessment
 - 17.4. Impact Significance
 - 17.5. Mitigation Measures
 - 17.6. Residual Impacts
- 18. Terrestrial Ecology
 - 18.1. Assessment methodology
 - 18.2. Baseline conditions
 - 18.3. Impact Assessment
 - 18.4. Impact Significance
 - 18.5. Mitigation Measures
 - 18.6. Residual Impacts
- 19. Transport And Access

- 19.1. Assessment methodology
- 19.2. Baseline conditions
- 19.3. Impact Assessment
- 19.4. Impact Significance
- 19.5. Mitigation Measures
- 19.6. Residual Impacts
- 20. Socio-Economics
 - 20.1. Assessment methodology
 - 20.2. Baseline Conditions
 - 20.3. Assessment of Impacts
 - 20.4. Impact Significance
 - 20.5. Mitigation Measures
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- 21. Waste Management
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 - 21.2. Baseline Conditions
 - 21.3. Regional Waste Management Infrastructure
 - 21.4. Identification of Waste Streams
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- 22. Landscape And Visual

- 22.1. Assessment methodology
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- 22.6. Residual impacts
- 23. Archaeology and Culture Heritage
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 - 23.5. Impact Significance
 - 23.6. Mitigation measures
 - 23.7. Residual impacts
- 24. Cumulative Impact Assessment
 - 24.1. Introduction
 - 24.2. Impact Interaction
 - 24.2.1.1. Development Interaction
- 25. Framework Environmental Management Plans
 - 25.1. Construction Environmental Management Plan (CEMP)
 - 25.2. Operational Environmental Management Plan (OEMP)
- 26. Monitoring Program
 - 26.1. Introduction

26.2. Construction Phase Monitoring

26.3. Operation Phase Monitoring

27. Conclusion

28. Reference