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15 June 2016

CLP Power Hong Kong Limited

**Environmental Impact Assessment (EIA) Ordinance, Cap.499
Application for EIA Study Brief**

**Project Title: Hong Kong Offshore LNG Terminal
(Application No. ESB-292/2016)**

I refer to your above application received on 6 May 2016 for an EIA Study Brief under Section 5(1)(a) of the EIA Ordinance.

In accordance with Section 5(7)(a) of the EIA Ordinance and after public inspection of the project profile, I issue the attached EIA Study Brief (No. ESB-292/2016) for your preparation of an EIA report.

Under Section 15 of the EIA Ordinance, the EIA Study Brief will be placed on the EIA Ordinance Register. It will also be placed on the EIA Ordinance website (<http://www.epd.gov.hk/eia/>).

You may submit an application for approval of the EIA report in accordance with Section 6(2) of the EIA Ordinance after its completion. Upon receipt of your application, this department will decide under Section 6(3) of the EIA Ordinance whether the EIA report meets the requirements of the EIA Study Brief and Technical Memorandum on EIA Process, and accordingly advise you under Section 6(4) of the EIA Ordinance whether a submission to the Advisory Council on the Environment (ACE) or its subcommittee is required. In this connection, you are required to provide sufficient copies of the Executive Summary of the EIA report to the Secretariat of the EIA Subcommittee of the Council for selection for submission when you submit the EIA report to this department for approval. Please liaise with Ms. Becky LAM (Tel: 2594 6323) regarding the details in due course.

If the EIA report is selected by ACE for submission and presentation, you are expected to provide ACE with an account of the environmental issues arising from the project, major conclusions and recommendations of the EIA study. In particular, the main environmental concerns of the general public and interest groups who may be affected by the Project should be identified and addressed in the EIA study. As such, you are strongly advised to engage the public and interest groups during the course of the EIA study. Please find attached a copy of the "*Modus Operandi of the EIA Subcommittee of the Advisory Council on the Environment*" for your reference.

Please note that if you are aggrieved by any of the content of this EIA Study Brief, you may appeal under Section 17 of the EIA Ordinance within 30 days of receipt of this EIA Study Brief.

Should you have any queries on the above application, please contact my colleague Mr. Matthew CHAN at 2835 1155.

Yours sincerely,



(Terence TSANG)

Acting Principal Environmental Protection Officer
for Director of Environmental Protection

Encl.

c.c. (w/o encl.)

Secretary of ACE EIA Subcommittee

(Attn : Ms. Becky LAM)

Fax: 2872 0603

Environmental Impact Assessment Ordinance (Cap. 499), Section 5 (7)**Environmental Impact Assessment Study Brief No. ESB-292/2016**

**Project Title : Hong Kong Offshore LNG Terminal
(hereinafter known as the "Project")**

**Name of Applicant : CLP Power Hong Kong Limited
(hereinafter known as the "Applicant")**

1. BACKGROUND

- 1.1 An application (No. ESB-292/2016) for an Environmental Impact Assessment (EIA) study brief under section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by the Applicant on 6 May 2016 with a project profile (No. PP-537/2016) (the Project Profile).
- 1.2 The Project is to construct and operate an offshore liquefied natural gas (LNG) terminal and associated facilities to enable LNG carriers to deliver cargoes of LNG for transferring to and storing in a Floating Storage and Regasification Unit (FSRU) vessel and then supplying LNG to the power stations in Hong Kong. The Project will comprise the following key infrastructural components :-
- a) a FSRU vessel equipped with LNG storage tanks and regasification equipment;
 - b) a double berth jetty with mooring facilities for the FSRU vessel and LNG carriers;
 - c) two subsea gas pipelines connecting the FSRU vessel with the Black Point Power Station (BPPS) and the Lamma Power Station (LPS) respectively; and
 - d) gas receiving stations (GRSs) located entirely within the BPPS and LPS respectively.

The offshore LNG terminal is proposed to be located in the southern waters of Hong Kong. The location plan of the Project is shown in Figure 1 of this study brief.

- 1.3 Based on the information provided in the Project Profile, the Project will comprise the following designated projects :-
- a) Item C.12, Part 1, Schedule 2 of the EIAO : *a dredging operation exceeding 500,000m³*;
 - b) Item H.2, Part 1, Schedule 2 of the EIAO : *a submarine gas pipeline*; and
 - c) Item L.2, Part 1, Schedule 2 of the EIAO : *a storage, transfer and trans-shipment of liquefied natural gas facility with a storage capacity of not less than 200 tonnes*.
- 1.4 Pursuant to section 5(7)(a) of the EIAO, the Director of Environmental Protection (the Director) issues this Environmental Impact Assessment (EIA) study brief to the Applicant to carry out an EIA study.

1.5 The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the Project and associated works that will take place concurrently. This information will contribute to decisions by the Director on:

- (i) the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project and associated works;
- (ii) the conditions and requirements for the detailed design, construction and operation of the Project and associated works to mitigate against adverse environmental consequences wherever practicable; and
- (iii) the acceptability of residual impacts after the proposed mitigation measures are implemented.

2. OBJECTIVES OF THE EIA STUDY

2.1 The objectives of the EIA study are as follows:

- (i) to describe the Project and associated works together with the requirements and environmental benefits for carrying out the Project;
- (ii) to identify and describe the elements of the community and environment likely to be affected by the Project and associated works and/or likely to cause adverse impacts to the Project, including both the natural and man-made environment and the associated environmental constraints;
- (iii) to identify and quantify the potential hazard to life due to the Project and associated works and activities;
- (iv) to identify and quantify emission sources and determine the significance of impacts on sensitive receivers and potential affected uses;
- (v) to identify and quantify any potential losses or damage to flora, fauna and natural habitats;
- (vi) to identify any potential visual and glare impacts and to propose measures to mitigate these impacts;
- (vii) to identify any negative impacts on archaeological resources and to propose measures to mitigate these impacts;
- (viii) to propose the provision of infrastructure or mitigation measures so as to prevent or minimize hazard to life, pollution, environmental disturbance and nuisance during construction and operation of the Project;
- (ix) to investigate the feasibility, effectiveness and implications of the proposed mitigation measures;
- (x) to identify, predict and evaluate the residual (i.e. after practicable mitigation) environmental impacts and the cumulative effects expected to arise during the construction and operation phases of the Project in relation to the sensitive

receivers and potential affected uses;

- (xi) to identify, assesses and specify methods, measures and standards, to be included in the detailed design, construction and operation of the Project which are necessary to mitigate these residual environmental impacts and cumulative effects and reduce them to acceptable levels;
- (xii) to design and specify the environmental monitoring and audit requirements; and
- (xiii) to identify any additional studies necessary to implement the mitigation measures or monitoring and proposals recommended in the EIA report.

3. DETAILED REQUIREMENTS OF THE EIA STUDY

3.1 The Purpose

- 3.1.1 The purpose of this study brief is to set out the purposes and objectives of the EIA study, the scope of environmental issues which shall be addressed, the requirements that the EIA study shall need to fulfil, and the necessary procedural and reporting requirements. The Applicant shall demonstrate in the EIA report whether the criteria in the relevant sections of the Technical Memorandum on the Environmental Impact Assessment Process of the Environmental Impact Assessment Ordinance (hereinafter referred to as the "TM") are complied with.

3.2 The Scope

- 3.2.1 The scope of this EIA study shall cover the Project and associated works mentioned in sub-section 1.2 above. For the purpose of assessing whether the environmental impacts shall comply with the criteria of the TM, the EIA study shall address the key issues described below, together with any other key issues identified during the course of the EIA study:

- (i) environmental benefits and dis-benefits of different development sitings and alignments, construction methods, system design and operational mode of the Project with a view to deriving option(s) for siting, aligning, constructing and operating the Project that will avoid or minimise adverse environmental impact;
- (ii) potential hazard to life on the general public due to the construction and operation of the Project, including the risks associated with storage, transfer, handling and use of natural gas and other dangerous goods, marine transport and activities of LNG carriers and FSRU vessel within Hong Kong waters in normal and adverse weather or tidal situations, and accidental spillage or leakage of natural gas;
- (iii) potential hydrodynamic and water quality impact due to the construction and operation of the Project and associated works, including impacts arising from the capital and maintenance dredging for the Project, construction of the jetty, laying, maintenance and repairing of the subsea gas pipelines, discharge of cooled seawater with or without added or concentrated chemical (e.g. toxic antifouling chemical) including change in water temperature or salinity due to the discharge, marine transport and activities of LNG carriers and FSRU vessel and accidental spillage or leakage of natural gas, dangerous goods and/or other chemicals, and impact due to ballast water of LNG carriers e.g. release of toxic substances, etc.;

- (iv) potential ecological impact due to the construction and operation of the Project and associated works, including impacts arising from capital and maintenance dredging for the Project, construction of the jetty, laying, maintenance and repair of the subsea gas pipelines, intake of seawater, discharge of cooled seawater containing antifoulants, marine transport and activities of LNG carriers and FSRU vessel, operational lightings and glare effect of the Project and accidental spillage or leakage of natural gas, dangerous goods and/or other chemicals, and impacts on ecological sensitive areas and species such as existing, planned or potential Marine Parks, horseshoe crab breeding and nursery grounds, mangroves, coral communities, marine benthos of conservation interest, Chinese White Dolphins, Finless Porpoises, Green Turtles, Whale Sharks, White-bellied Sea Eagle, Horseshoe Crabs, *Amphioxus* sp., seabirds and migratory birds;
- (v) potential fisheries impacts due to the construction and operation of the Project and associated works, including impacts arising from capital and maintenance dredging for the Project, construction of the jetty, laying, maintenance and repair of the subsea gas pipelines, intake of seawater, discharge of cooled seawater containing antifoulants, marine transport and activities of LNG carriers and FSRU vessel and accidental spillage or leakage of natural gas, dangerous goods and/or other chemicals, and impacts on fisheries sensitive areas and fisheries resources such as fishing grounds, fish culture zones, spawning and nursery grounds, adult and fry fish, eggs, and larvae;
- (vi) potential waste management implications arising from the construction and operation of the Project, including handling and disposal of dredged sediments, construction and demolition materials, chemical waste and general refuse;
- (vii) potential air quality impact on air sensitive receivers (ASRs) due to the operation of the Project, associated works and marine activities;
- (viii) potential noise impact on noise sensitive receivers (NSRs) due to the operation of the Project, associated works and marine activities;
- (ix) potential visual impacts and glare effect due to the construction and operation of the Project and associated works;
- (x) potential marine archaeological impact due to the construction of the Project; and
- (xi) potential cumulative environmental impacts of the Project, through interaction or in combination with other existing, committed and planned projects in the vicinity of the Project, and that those impacts may have a bearing on the environmental acceptability of the Project.

3.3 Description of the Project

3.3.1 Purpose(s) and Objectives of the Project

The Applicant shall provide information on the purpose(s) and objectives of the Project, and describe the benefit of the Project and scenarios with and without the Project.

3.3.2 Details of the Project

The Applicant shall indicate the nature and status of the project decision(s) for which the EIA study is undertaken. The Applicant shall describe the design, size, construction methods, nature and methods of production or other major activities involved in the construction and operation of the Project, using diagrams, plans and/or maps as necessary. The estimated duration of the construction phase and operational phase of the Project together with the programme within these phases shall be given. The land taken by the Project site(s), construction sites and associated access arrangements, auxiliary facilities and landscaping areas shall be shown on a scaled map. The uses of the Project shall be described and the different land use areas shall be demarcated as appropriate.

3.3.3 Background and History of the Project

The Applicant shall provide information on the site location and site history of the Project, any related projects, and consideration of different practicable siting, layout and alignment options of the jetty and subsea gas pipelines of the Project at available locations. The key reasons for selecting the proposed siting, layout and alignment of the Project and the construction methods and associated access arrangements for the Project, and the part environmental factors played in the selection shall be described. The main environmental impacts of different practicable siting, layout and alignment options shall be compared with those of the Project and with the likely future environmental conditions in absence of the Project.

3.4 **Technical Requirements**

3.4.1 The Applicant shall conduct the EIA study to address the environmental aspects of the activities as described in the scope set out above. The assessment shall be based on the best and latest information available during the course of the EIA study.

3.4.2 The EIA report shall include the construction and operational programmes as well as approaches and methodologies for assessing environmental impacts of the Project. The EIA report shall provide the time frame, staged implementation programme, and works programmes of the Project and other concurrent projects, for assessing the cumulative environmental impacts from the Project and interacting projects as identified in the EIA study.

3.4.3 The EIA study shall follow the technical requirements specified below and in the Appendices of this EIA study brief.

3.4.4 **Air Quality Impact**

3.4.4.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing air quality impact as stated in Section 1 of Annex 4 and Annex 12 of the TM respectively.

3.4.4.2 The study area for air quality impact assessment shall be defined by a distance of 500 meters from the boundary of the Project site or other project locations as identified in the EIA, which shall be extended to include major existing, planned and committed air pollutant emission sources that may have a bearing on the environmental acceptability of the Project. The assessment shall include the existing, planned and committed sensitive receivers within the study area as well as areas where air quality may be potentially affected by the Project. The assessment shall also take into account the impacts of emission sources from nearby concurrent projects, if any.

3.4.4.3 The air quality impact assessment shall follow the detailed technical requirements given in Appendix A.

3.4.5 Hazard to Life

3.4.5.1 The Applicant shall follow the criteria for evaluating hazard to life impact as stated in Section 2 of Annex 4 of the TM.

3.4.5.2 The hazard to life assessment shall include the risks associated with storage, transfer, handling and use of natural gas and other dangerous goods, marine transport and activities of LNG carriers and FSRU vessel and natural gas submarine pipeline within Hong Kong waters in normal and adverse weather or tidal situations, and accidental spillage or leakage of natural gas. The hazard to life assessment for the construction and operation of the Project shall follow the detailed technical requirements given in Appendix B.

3.4.5.3 The Applicant shall consider other potential contributors to the risk, which may include BPPS, LPS and their GRS facilities, the operation of helicopters, high speed ferries and helipads in proximity, and the operation of other existing, planned and committed potentially hazardous installations (PHIs), liquefied petroleum gas installations and dangerous goods installations in the vicinity.

3.4.6 Noise Impact

3.4.6.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing noise impact as stated in Annex 5 and Annex 13 of the TM respectively.

3.4.6.2 Assessment shall include the construction and operational noise impact assessment of the existing, committed and planned NSRs earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans, Layout Plans and other relevant published land use plans, including plans and drawings published by the Lands Department and any land use and development applications approved by the Town Planning Board, in the vicinity of the Project.

3.4.6.3 The Applicant shall propose the assessment area for agreement of the Director before commencing the assessment. The assessment area for the noise impact assessment shall generally include areas within 300 meters from the boundary of the Project and the works of the Project. For construction, if NSRs are identified within the assessment area, quantitative noise impact assessment shall be carried out. The Applicant shall propose methodology for agreement of the Director, with reference to Section 4.4.2 of the TM, prior to the commencement of the assessment.

3.4.6.4 For operation, the noise impact assessment for the operation of the Project shall follow the detailed technical requirements given in Appendix C.

3.4.7 Water Quality Impact

3.4.7.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing water pollution as stated in Annexes 6 and 14 of the TM respectively.

3.4.7.2 The study area for the water quality impact assessment shall cover the Southern Water Control Zone, Second Southern Supplementary Water Control Zone, North Western

Water Control Zone and North Western Supplementary Water Control Zone as designated under the Water Pollution Control Ordinance (Cap. 358). The study area shall be extended to include other areas if they are found also being impacted during the course of the EIA study and have a bearing on the environmental acceptability of the Project. The assessment shall include water sensitive receivers in the vicinity of the Project.

3.4.7.3 The water quality impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in Appendix D.

3.4.8 Waste Management Implication

3.4.8.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing waste management implication as stated in Annexes 7 and 15 of the TM respectively.

3.4.8.2 The assessment of the waste management implication arising from the construction and operation of the Project shall follow the detailed technical requirements given in Appendix E.

3.4.9 Ecological Impact

3.4.9.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing ecological impact as stated in Annexes 8 and 16 of the TM respectively.

3.4.9.2 The assessment area for the purpose of the terrestrial ecological impact assessment shall include areas within 500 meters distance from the boundary of the Project and any other areas likely to be impacted by the Project. For marine ecological impact assessment, the assessment area shall be the same as the water quality impact assessment described in section 3.4.7.2. The assessment shall include ecological sensitive receivers in the vicinity of the Project, including but not limited to existing, planned and potential Marine Parks, horseshoe crab breeding and nursery grounds, mangroves, coral communities, marine benthos of conservation interest, and ecological important species including but not limited to Chinese White Dolphins, Finless Porpoises, Green Turtles, Whale Sharks, *Amphioxus* sp., Horseshoe Crabs, White-bellied Sea Eagle, seabirds and migratory birds.

3.4.9.3 The ecological impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in Appendix F.

3.4.10 Fisheries Impact

3.4.10.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing fisheries impact as stated in Annexes 9 and 17 of the TM respectively.

3.4.10.2 The study area shall be the same as the water quality impact assessment as stipulated in Section 3.4.7.2. The study area shall be extended to include other areas if they are also found likely to be impacted by the construction or operation of the Project during the course of the EIA study. Special attention shall be given to potential loss or disturbance of fishing grounds, fisheries resources and habitats, spawning or nursery grounds, adverse impacts on the fish spawning and nursery area in the southern waters including the fish fry area at Tai A Chau, and water quality deterioration at sensitive receivers such as fishing grounds in the southern waters, spawning or nursery grounds, fish culture zones and artificial reefs.

3.4.10.3 The fisheries impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in Appendix G.

3.4.11 Visual Impact

3.4.11.1 The Applicant shall follow the criteria and guidelines as stated in Annexes 10 and 18 of the TM respectively, and the EIAO Guidance Note No. 8/2010 on "Preparation of Landscape and Visual Impact Assessment under the Environmental Impact Assessment Ordinance" for evaluating and assessing visual impact and glare effect.

3.4.11.2 The assessment area for the visual impact assessment shall be defined by the visual envelope of the Project.

3.4.11.3 The visual impact assessment for the construction and operation of the Project shall follow the detailed technical requirements given in Appendix H.

3.4.12 Impact on Cultural Heritage

3.4.12.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing the cultural heritage impact as stated in Annexes 10 and 19 of the TM respectively.

3.4.12.2 A marine archaeological investigation (MAI) shall be conducted. It shall include area to be affected by the marine and dredging works of the Project. The MAI shall follow the detailed technical requirements given in Appendix I.

3.5 Environmental Monitoring and Audit (EM&A) Requirements

3.5.1 The Applicant shall identify and justify in the EIA study whether there is any need for EM&A activities during the construction and operation phases of the Project and, if affirmative, to define the scope of the EM&A requirements for the Project in the EIA study.

3.5.2 Subject to the confirmation of the EIA study findings, the Applicant shall comply with the requirements as stipulated in Annex 21 of the TM.

3.5.3 The Applicant shall prepare a project implementation schedule (in the form of a checklist as shown in Appendix J) containing the EIA study recommendations and mitigation measures with reference to the implementation programme.

4. DURATION OF VALIDITY

4.1 The Applicant shall notify the Director of the commencement of the EIA study. If the EIA study does not commence within 36 months after the date of issue of this EIA study brief, the Applicant shall apply to the Director for a fresh EIA study brief before commencement of the EIA study.

5. REPORTING REQUIREMENTS

5.1 In preparing the EIA report, the Applicant shall refer to Annex 11 of the TM for the contents of an EIA report. The Applicant shall also refer to Annex 20 of the TM, which

stipulates the guidelines for the review of an EIA report.

5.2 The Applicant shall present the following summary information in the EIA report :

(i) Summary of Environmental Outcomes

The EIA report shall contain a summary of key environmental outcomes arising from the EIA study, including estimated population protected from various environmental impacts, environmentally sensitive areas protected, environmentally friendly options considered and incorporated in the preferred option, environmental designs recommended, key environmental problems avoided, compensation areas included and the environmental benefits of environmental protection measures recommended.

(ii) Summary of Environmental Impacts

To facilitate effective retrieval of pertinent key information, the EIA report shall contain a summary table of environmental impacts showing the assessment points, results of impact predictions, relevant standards or criteria, extents of exceedances predicted, impact avoidance measures considered, mitigation measures proposed and residual impacts (after mitigation). This summary shall cover each individual impact and shall also form an essential part of the executive summary of the EIA report.

(iii) Summary of Alternative Options and Mitigation Measures

The EIA report shall contain a summary of alternative development options and mitigation measures considered during the course of the EIA study, including the alternative sitings and alignments, construction methods and associated access arrangements, system design and operational mode of the Project with a view to avoiding or minimizing adverse environmental impacts. A comparison of the environmental benefits and dis-benefits of applying different development options and/or mitigation measures shall be made.

(iv) Documentation of Key Assessment Assumptions, Limitation of Assessment Methodologies and related Prior Agreement(s) with the Director

The EIA report shall contain a summary including the assessment methodologies and key assessment assumptions adopted in the EIA study, the limitations of these assessment(s) methodologies/assumptions, if any, plus relevant prior agreement(s) with the Director or other Authorities on individual environmental media assessment components. The proposed use of any alternative assessment tool(s) or assumption(s) have to be justified by the Applicant, with supporting documents based on cogent, scientific and objectively derived reason(s) before seeking the Director's agreement. The supporting documents shall be provided in the EIA report.

(v) Documentation of Public Concerns

The EIA report shall contain a summary of key concerns of the general public, interested parties and relevant statutory or advisory bodies identified or received by the Applicant during the course of the EIA study, and describe how the relevant concerns have been taken into account and addressed in the EIA study.

5.3 The Applicant shall supply the Director with hard and electronic copies of the EIA report and the executive summary in accordance with the requirements given in Appendix K of this EIA study brief. The Applicant shall, upon request, make additional copies of the above documents available to the public, subject to payment by the interested parties of

full costs of printing.

6. OTHER PROCEDURAL REQUIREMENTS

- 6.1 If there is any change in the name of the Applicant for this EIA study brief during the course of EIA study, the Applicant must notify the Director immediately.
- 6.2 If there is any key change in the scope of the Project mentioned in section 1.2 of this EIA study brief and in Project Profile (No. PP-537/2016), the Applicant must seek confirmation from the Director in writing on whether or not the scope of issues covered by this EIA study brief can still cover the key changes, and any additional issues must also be addressed in the EIA study. If the changes to the Project fundamentally alter the key scope of the EIA study brief, the Applicant shall apply to the Director for a fresh EIA study brief.

7. LIST OF FIGURES AND APPENDICES

- 7.1 This EIA study brief includes the following figure and appendices:

Figure 1 – Location Plan of the Project

Appendix A - Requirements for Air Quality Impact Assessment

Appendix A1 - Air Quality Modelling Guidelines

Appendix B - Requirements for Hazard to Life Assessment

Appendix C - Requirements for Noise Impact Assessment

Appendix D - Requirements for Water Quality Impact Assessment

Appendix D1 - Hydrodynamic and Water Quality Modelling Requirements

Appendix E - Requirements for Assessment of Waste Management Implications

Appendix F - Requirements for Ecological Impact Assessment

Appendix G - Requirements for Fisheries Impact Assessment

Appendix H - Requirements for Visual Impact Assessment

Appendix I - Requirements for Cultural Heritage Impact Assessment
(Marine Archaeological Investigation)

Appendix II - Guidelines for Marine Archaeological Investigation (MAI)

Appendix J - Implementation Schedule

Appendix K - Requirements for EIA Report Documents

END of EIA STUDY BRIEF

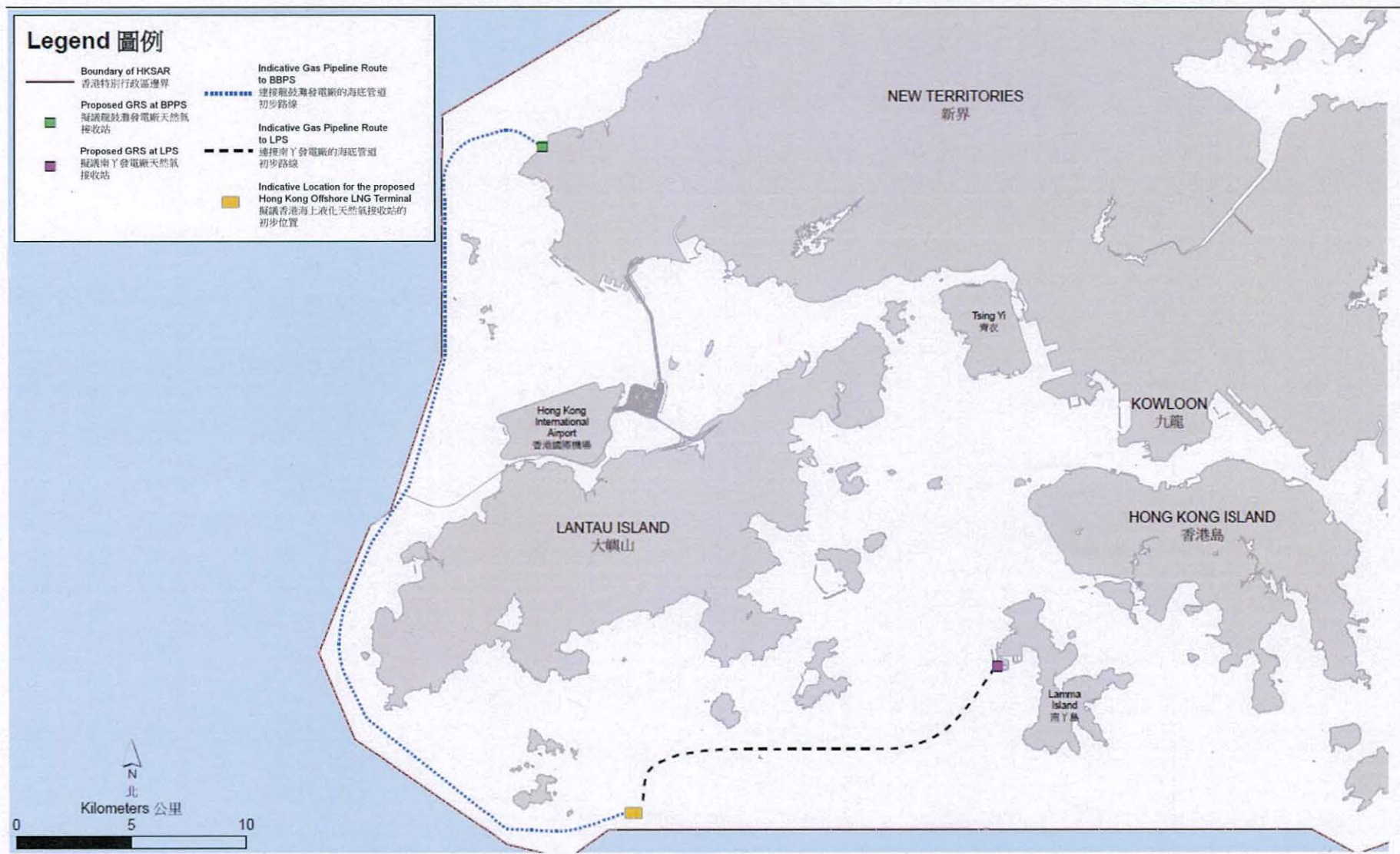
June 2016

Environmental Assessment Division

Environmental Protection Department

Legend 圖例

- Boundary of HKSAR
香港特別行政區邊界
- Proposed GRS at BBPS
擬議龍鼓灘發電廠天然氣接收站
- Proposed GRS at LPS
擬議南丫發電廠天然氣接收站
- Indicative Gas Pipeline Route to BBPS
連接龍鼓灘發電廠的海底管道初步路線
- Indicative Gas Pipeline Route to LPS
連接南丫發電廠的海底管道初步路線
- Indicative Location for the proposed Hong Kong Offshore LNG Terminal
擬議香港海上液化天然氣接收站的初步位置



Project Title : Hong Kong Offshore LNG Terminal
 (This figure is prepared based on Figure 2.4 of Project Profile No.: PP-537/2016)
 工程項目名稱：香港海上液化天然氣接收站
 (本圖是根據工程項目簡介 PP-537/2016 圖則編號 2.4 編製)

EIA Study Brief No. : ESB-292/2016
 環評研究概要編號：

Figure 1: Location Plan of the Project
 圖 1: 工程項目位置圖



Requirements for Air Quality Impact Assessment

The air quality impact assessment shall include the following:

1. Background and Analysis of Activities

- (i) Provision of background information relating to air quality issues relevant to the Project, e.g. description of the types of activities of the Project that may affect air quality during construction and operational stages of the Project.
- (ii) Given an account, where appropriate, of the consideration/measures that have been taken into consideration in the planning of the Project to abate the air pollution impact. The Applicant shall consider alternative operation modes to minimize the air quality impact during operation stage of the Project.
- (iii) Presentation of background air quality levels in the study area for the purpose of evaluating cumulative air quality impacts of the Project. If PATH (Pollutants in the Atmosphere and their Transport over Hong Kong) model is used to estimate the background air quality, details for the estimation of the emission sources to be adopted in the model runs should be clearly presented.

2. Identification of Air Sensitive Receivers (ASRs) and Examination of Emission/Dispersion Characteristics

- (i) Identification and description of existing, planned and committed ASRs that would likely be affected by the Project, including those earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans, Layout Plans and other relevant published land use plans, including plans and drawings published by Lands Department and any land use and development applications approved by the Town Planning Board. The Applicant shall select the assessment points of the identified ASRs that represent the worst impact point of these ASRs. A map clearly showing the location and description such as name of buildings, their uses and height of the selected assessment points shall be given. The separation distances of these ASRs from the nearest emission sources of the project shall also be given.
- (ii) Provision of a list of air pollutant emission sources, including any nearby emission sources which are likely to have impact related to the Project based on the analysis of the activities during the construction and operational stage of the Project in section 1 above. Confirmation regarding the validity of the assumptions adopted and the magnitude of the activities shall be obtained from the relevant government departments /authorities and documented.
- (iii) The emissions from any concurrent projects identified as relevant during the course of the EIA study shall be taken into account as contributing towards the overall cumulative air quality impact. The impact at the existing, committed and planned ASRs within the assessment area shall be assessed, based on the best information available at the time of assessment.

3. Construction Phase Air Quality Impact

- (i) The Applicant shall follow the requirements stipulated under the Air Pollution Control (Construction Dust) Regulation to ensure that construction dust impacts are controlled within the relevant standards as stipulated in section 1 of Annex 4 of the TM.
- (ii) If the Applicant anticipates that the Project will give rise to significant construction dust impacts likely to exceed recommended limits in the TM at the ASRs despite the incorporation of the dust control measures proposed, a quantitative assessment shall be carried out to evaluate the construction dust impact at the identified ASRs. The Applicant shall follow the methodology set out in section 5 below when carrying out the quantitative assessment.
- (iii) A monitoring and audit programme for the construction phase of the Project shall be devised to verify the effectiveness of the proposed control measures so as to ensure proper control of fugitive dust emission.

4. Operational Phase Air Quality Impact

- (i) The Applicant shall assess the expected air pollutant impacts at the identified ASRs arising from the operation of the Project (e.g. emissions at the FSRU vessel, LNG carriers and gas receiving stations, and marine traffic emissions induced by the operation of the Project, etc.) based on an assumed reasonably worst-case scenario under normal operating conditions of the Project. If the Applicant anticipates that the Project and associated works will give rise to significant air quality impacts likely to exceed the recommended limits in the TM at the ASRs despite the incorporation of proposed mitigation measures, a quantitative assessment shall be carried out to evaluate the operational phase air quality impacts at the identified ASRs. The Applicant shall follow the methodology set out in section 5 below when carrying out the quantitative assessment.
- (ii) A monitoring and audit programme for the operational phase of the Project shall be devised to verify the effectiveness of the control measures proposed so as to ensure proper control of operational air quality impacts.

5. Quantitative Assessment Methodology

If quantitative assessment is required, the Applicant should follow the relevant methodology set out below when carrying out the assessment:

- (i) The Applicant shall conduct the quantitative assessment by applying the general principles enunciated in the modelling guidelines in Appendix A-1 while making allowance for the specific characteristic of the Project. In case of doubt, prior agreement between the Applicant and the Director on specific modelling details shall be sought.
- (ii) The Applicant shall identify the key/representative air pollutant parameters (types of pollutants and the averaging time concentrations) to be evaluated and provide explanation for selecting such parameters for assessing the impact from the Project and associated works.
- (iii) Calculation of the relevant pollutant emission rates for input to the model and a

map showing the emission sources shall be presented in the EIA report. A summary table of the emission rates shall be presented in the EIA report. The Applicant shall ensure consistency between the text description and the model files at every stage of submission for review.

- (iv) The Applicant shall calculate the overall cumulative air quality impact at the ASRs identified under Section 2 above and compare these results against the criteria set out in Section 1 of Annex 4 in the TM. The predicted air quality impacts (both unmitigated and mitigated) shall be presented in the form of summary table(s) and pollution contours, to be evaluated against the relevant air quality standards and on any effect they may have on the land use implications. Plans of a suitable scale should be used to present pollution contours to allow buffer distance requirements to be determined properly.

6. Mitigation Measures for Non-compliance

The Applicant shall propose remedies and mitigating measures where the predicted air quality impact exceeds the criteria set in section 1 of Annex 4 in the TM. These measures and other associated constraints on future land use planning shall be agreed with the relevant government departments/authorities and documented. The Applicant shall demonstrate quantitatively whether the residual impacts after incorporation of the proposed mitigating measures will comply with the criteria stipulated in section 1 of Annex 4 in the TM.

7. Submission of Model Files

Input and output file(s) of the model run(s), including those files for generating the pollution contours and emission calculation work sheets, shall be submitted to the Director in electronic format together with the submission of the EIA report.

Appendix A-1

Air Quality Modelling Guidelines

[The information contained in this Appendix is meant to assist the Applicant in performing the air quality assessment. The Applicant must exercise professional judgment in applying this general information.]

The air quality modelling guidelines shall include the following guidelines as published on the website of the Environmental Protection Department (http://www.epd.gov.hk/epd/english/environmentinhk/air/guide_ref/guide_aqa_model.html):

- i) Guidelines on Choice of Models and Model Parameters;
- ii) Guidelines on Assessing the "Total" Air Quality Impact ;
- iii) Guidelines on the Use of Alternative Computer Models in Air Quality Assessment;
- iv) Guidelines on the Estimation of PM_{2.5} for Air Quality Assessment in Hong Kong; and
- v) Guidelines on the Estimation of 10-minute Average SO₂ Concentration for Air Quality Assessment in Hong Kong.

Requirements for Hazard to Life Assessment**1. Natural Gas**

The Applicant shall carry out hazard assessment to evaluate the risk to off-site population during construction and operation stages of the Project due to the transport; transfer, storage, handling and use of natural gas. The hazard assessment shall include:

- (i) identify hazardous scenarios associated with the transport, transfer, storage, handling and use of natural gas with a view to determining a set of relevant scenarios to be included in a Quantitative Risk Assessment (QRA);
- (ii) execute a QRA of the set of hazardous scenarios determined in item 1(i) above, expressing population risks in both individual and societal terms;
- (iii) compare individual and societal risks with the criteria for evaluating hazard to life stipulated in Section 2 of Annex 4 of the TM; and
- (iv) identify and assess practicable and cost-effective risk mitigation measures.

The Applicant shall address and assess the risk to off-site population during operation stage of the Project due to the transport, transfer, storage, handling and use of natural gas in the conditions of adverse weather, extreme tide and accidental spillage or leakage of natural gas, and formulate the contingency or emergency plans for handling the adverse conditions during operation stage of the Project.

2. Other Dangerous Goods

The Applicant shall carry out hazard assessment to evaluate the risk to off-site population during construction and operation stages of the Project due to the transport, storage and use of other dangerous goods defined in Dangerous Goods Ordinance (Cap. 295) but not covered by the Gas Safety Ordinance (Cap. 51). The hazard assessment shall include:

- (i) identify hazardous scenarios associated with the transport, storage and use of other dangerous goods for the Project, and then determine a set of relevant scenarios to be included in a QRA;
- (ii) execute a QRA of the set of hazardous scenarios determined in item 2(i), expressing population risks in both individual and societal terms;
- (iii) compare individual and societal risks with the criteria for evaluating hazard to life stipulated in section 2 of Annex 4 of the TM; and
- (iv) identify and assess practicable and cost-effective risk mitigation measures.

The Applicant shall address and assess the risk to off-site population during operation stage of the Project due to the transport, storage and use of other dangerous goods in the conditions of adverse weather, extreme tide and accidental spillage or leakage of other dangerous goods, and formulate the contingency or emergency plans for handling in the adverse conditions during operation stage of the Project.

3. **Methodology**

The hazard assessment methodology shall be consistent with previous studies having similar issues and be agreed with the Director.

Requirements for Noise Impact Assessment

The noise impact assessment shall include the following:

1. Description of the Noise Environment

The Applicant shall describe the prevailing noise environment in the EIA report.

2. Operational Noise Impact Assessment

2.1 Fixed Noise Sources Impact Assessment Methodology

2.1.1 The Applicant shall carry out fixed noise sources impact assessment from the Project in accordance with the methodology in paragraph 5.2 of Annex 13 of the TM.

2.2 Identification of Fixed Noise Sources Impact

2.2.1 Identification of Assessment Area and Noise Sensitive Receivers (NSRs)

- (a) The Applicant shall propose the assessment area for agreement of the Director before commencing the assessment. The assessment area for the fixed noise sources impact shall generally include areas within 300 meters from the boundary of the Project and the works of the Project.
- (b) The Applicant shall identify all existing, committed and planned NSRs in the assessment area and select assessment points to represent identified NSRs for carrying out quantitative fixed noise sources impact assessment described below.
- (c) The assessment points shall be confirmed with the Director prior to the commencement of the quantitative fixed noise sources impact assessment and may be varied subject to the best and latest information available during the course of the EIA study.
- (d) A map showing the location and description such as name of building, use, and floor of each and every selected assessment point shall be given. Photographs of existing NSRs shall be appended to the EIA report.
- (e) For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant land use and planning parameters and conditions to work out representative site layouts for fixed noise sources impact assessment purpose. However, such parameters and conditions together with any constraints identified shall be confirmed with the relevant responsible parties including Planning Department and Lands Department.

2.2.2 Inventory of Noise Sources

- (a) The Applicant shall analyse and quantify an inventory of noise sources for fixed noise sources impact assessment. The inventory of noise sources shall include, but not limited to, noise associated with any permanent and temporary industrial noise sources.

- (b) The Applicant shall provide document or certificate, accepted by recognized national/international organisation, for the sound power level of each type of fixed noise sources.
- (c) Validity of the inventory shall be confirmed with the relevant government departments/authorities and documented in the EIA report.

2.3 Prediction and Evaluation of Fixed Noise Sources Impact

2.3.1 Scenarios

- (a) The Applicant shall quantitatively assess the fixed noise sources impact of the Project, with respect to the criteria set in Annex 5 of the TM, of unmitigated scenario and mitigated scenario at assessment year of various operation modes including but not limited to
 - i) the worst operation mode which represents the maximum noise emission in connection of identified noise sources of the Project; and
 - ii) any other operation modes as confirmed with the Director.
- (b) Validity of the above operation modes shall be confirmed with relevant departments/authorities and documented in the EIA report.

2.3.2 Prediction of Noise Impact

- (a) The Applicant shall present the predicted noise levels in Leq (30 min) dB(A) at the selected assessment points at various representative floor levels (in m P.D.) on tables and plans of suitable scale.
- (b) The assessment shall cover the cumulative fixed noise sources impact resulting from the fixed noise sources due to the Project and on existing, committed and planned NSRs within the assessment area.
- (c) The potential fixed noise sources impact under different scenarios shall be quantified and other noise sensitive receivers that will be exposed to noise impact exceeding the criteria set in Annex 5 of the TM.

2.4 Mitigation of Fixed Noise Sources Impact

Direct Mitigation Measures - Where the predicted fixed noise sources impact exceeds the criteria set in Table 1A of Annex 5 of the TM, the Applicant shall consider and evaluate direct mitigation measures including but not limited to noise barrier/enclosure, etc. The feasibility, practicability, programming and effectiveness of the recommended mitigation measures shall be assessed. Any direct mitigation measures recommended shall be well documented in the report. Specific reasons for not adopting certain direct mitigation measures to reduce the noise to a level meeting the criteria in the TM or to maximize the protection for the NSRs as far as possible should be clearly quantified and documented in the EIA report.

2.5 Evaluation of Residual Fixed Noise Sources Impact

Upon exhaust of direct mitigation measures, if the mitigated noise impact still exceeds the relevant criteria in Annex 5 of the TM, the Applicant shall identify, predict and evaluate the residual fixed noise sources impact in accordance with Section 4.4.3 of the TM that will be exposed to residual noise impact exceeding the criteria set in Annex 5 in the TM.

Requirements for Water Quality Impact Assessment

1. The Applicant shall identify and analyse physical, chemical and biological disruptions of the water system(s) arising from the construction and operation of the Project.
2. The Applicant shall predict, quantify and assess any water quality impacts arising from the construction and operation of the Project by appropriate mathematical modelling and/or other techniques proposed by the Applicant and agreed with the Director. The mathematical modelling requirements are set out in Appendix D1 -1. Possible impacts due to, including but not limited to, dredging, fill extraction, backfilling, transportation and disposal of dredged materials, other marine works activities, effluent discharges, thermal/cooling water with or without toxic antifoulant (e.g. biocide) discharge and site runoff, and shall include changes in hydrology, flow and thermal regime, sediment erosion and deposition patterns, morphological change of seabed or coastal profile, water and sediment quality and marine organisms/community. The prediction shall include possible different construction stages or sequences of the Project. Affected sensitive receivers shall be identified by the assessment tool with indications of degree of severity.
3. The assessment shall include, but not limited to the following:
 - (i) water quality impacts of the site runoff generated during the construction stage such as the effluents generated from dewatering associated with piling activities, grouting and concrete washing and those specified in the ProPECC PN 1/94;
 - (ii) water quality impacts arising from marine dredging works including change in suspended solids and dissolved oxygen concentration, sediment plume dispersion, contaminant and nutrient release and any impacts which may be resulted in changing of water quality, impact from jetting works and any future maintenance dredging should also be included;
 - (iii) water quality impacts arising from cooled seawater discharges with or without added/concentrated chemicals such as toxic antifoulant, including but not limited to change in water temperature and salinity, and discharge of ballast water from LNG carriers ; and
 - (iv) water quality impacts on existing, planned or potential Marine Parks, designated area for secondary contact recreation, corals, potential water sports activities, beaches, marine mammal habitat, horseshoe crab breeding ground, amphiosus, green turtle and seawater intake points, etc.
4. The Applicant shall address water quality impacts due to the construction and operation of the Project. Essentially, the assessment shall address the following :
 - (i) collect and review background information on affected existing and planned water systems, their respective catchments and sensitive receivers which may be affected by the Project;
 - (ii) characterize water quality of the water systems and sensitive receivers, which may be affected by the Project based on existing best available information or through appropriate site survey and tests;

- (iii) identify and analyse relevant existing and planned future activities, beneficial uses and water sensitive receivers related to the affected water system(s). The Applicant should refer to, inter alia, those developments and uses earmarked on the relevant Outline Zoning Plans, Development Permission Area Plans, Outline Development Plans and Layout Plans, and any other relevant published land use plans;
- (iv) identify pertinent Water Quality Objectives and establish other appropriate water quality criteria or standards for the water system(s) and the sensitive receivers identified in (i), (ii) & (iii) above;
- (v) review the specific construction methods (e.g. consideration of possible alternative dredging methods) and configurations, and operation of the Project to identify and predict the likely water quality impacts arising from the Project;
- (vi) identify any alternation of any water courses, natural streams, ponds, wetlands, change of water holding/flow regimes, change of catchment types or areas, erosion or sedimentation due to the Project and any other hydrological changes in the assessment area;
- (vii) identify and quantify existing and likely future water pollution sources, including point discharges and non-point sources to surface water runoff, sewage from workforce and polluted discharge generated from the Project, contaminant release from works on marine sediment and sediment release or re-suspension from works into water bodies;
- (viii) provide an emission inventory on the quantities and characteristics of these existing and future pollution sources in the assessment area. Field investigation and laboratory test, shall be conducted as appropriate to fill relevant information gaps;
- (ix) predict and quantify the impacts on the water system(s) and their sensitive receivers due to those alternations and changes identified in (vi) above and the pollution sources identified in (vii) above. The prediction shall take into account and include possible different construction and operation stages of the Project;
- (x) assess the cumulative impacts due to other related concurrent and planned projects, activities or pollution sources in the vicinity of the assessment area (e.g. marine dumping ground, waste receiving and treatment facility) that may have a bearing on the environmental acceptability of the Project;
- (xi) analyse the provision and adequacy of existing and planned future facilities to reduce pollution arising from the point and non-point sources identified in (vii) above;
- (xii) develop effective construction methods (e.g. dredging methods and piling methods), infrastructure upgrading or provision, contingency plan, water pollution prevention and mitigation measures to be implemented during construction and operation stages, including sewage handling arrangement, emergency discharge (if any), so as to handle any wastewater discharge from the Project and to reduce the water quality impacts to within standards ;

- (xiii) investigate and develop best management practices to reduce storm water and non-point source pollution as appropriate; and
- (xiv) evaluate and quantify residual impacts on water system(s) and the sensitive receivers with regard to the appropriate water quality objectives, criteria, standards or guidelines. If the mitigated water quality impact still exceeds the relevant criteria in Annex 6 of TM, the Applicant shall identify, predict and evaluate the residual water quality impact in accordance with Section 4.4.3 of the TM and estimate the significance of the residual impact to the water system(s) and the water sensitive receivers.

5. Fuel Spillage

The Applicant shall assess the risk to environmental sensitive receivers due to significant accidental fuel spillage. The assessment shall include the followings:

- (i) Identification of fuel spillage scenarios associated with the operation of the Project, in particular the accidental spillage associated with storage, transfer and trans-shipment of fuel during the operation of the Project and the impact on water sensitive receivers by taking reference to results of the mathematical models as set out in Appendix D1-1;
- (ii) Prediction and quantification of the impacts on the sensitive receivers due to fuel spillage scenarios identified in (a). The prediction shall take into account and include different likely operational stages; and
- (iii) Derivation of emergency contingency plan for the operational phase of the Project with an aim to avoid and contain the spread and to remove accidental spillage in short notice and to prevent and/or to minimize the quantities of contaminants from reaching the water sensitive receivers in a shortest practical time.

Hydrodynamic and Water Quality Modelling Requirements

Modelling Software General

1. The modelling software shall be fully 3-dimensional capable of accurately simulating the stratified condition, salinity transport, and effects of wind and tide on the water body within the model area.
2. The modelling software shall consist of hydrodynamic, water quality, sediment transport, thermal and particle dispersion modules. All modules shall have been proven with successful applications locally and overseas.
3. The hydrodynamic, water quality, sediment transport and thermal modules shall be strictly mass conserved at all levels.
4. An initial dilution model shall be used to characterize the initial mixing of the effluent discharge, and to feed the terminal level and size of the plume into the far field water quality modules where necessary. The initial dilution model shall have been proven with successful applications locally and overseas.

Model Details – Calibration and Validation

1. The models shall be properly calibrated and validated against applicable existing and/or newly collected field data before their use in this study in the Hong Kong waters, the Pearl Estuary and the Dangan (Lema) Channel. The field data set for calibration and validation shall be agreed with EPD.
2. Tidal data shall be calibrated and validated in both frequency and time domain manner.
3. For the purpose of calibration and validation, the model shall run for not less than 15 days of real sequence of tide (excluding model spin up) in both dry and wet seasons with due consideration of the time required to establish initial conditions.
4. In general the hydrodynamic models shall be calibrated to the following criteria:

Criteria	Level of fitness <u>with field data</u>
tidal elevation (@)	< 8 %
maximum phase error at high water and low water	< 20 minutes
maximum current speed deviation	< 30 %
maximum phase error at peak speed	< 20 minutes
maximum direction error at peak speed	< 15 degrees
maximum salinity deviation	< 2.5 ppt
@ Root mean square of the error including the mean and fluctuating components shall meet the criteria at no less than 80% of the monitoring stations in the model domain	

5. The consultants shall be responsible for acquiring/developing and calibration of the models for use in this study themselves. They may make reference to the models developed under the Update on Cumulative Water Quality and Hydrological Effect of

Coastal Developments and Upgrading of Assessment Tool (Agreement No. CE 42/97). They may also propose to use other models subject to agreement with EPD.

Model Details – Simulation

1. The water quality modelling results shall be qualitatively explainable, and any identifiable trend and variations in water quality shall be reproduced by the model. The water quality model shall be able to simulate and take account of the interaction of dissolved oxygen, phytoplankton, organic and inorganic nitrogen, phosphorus, silicate, BOD, temperature, suspended solids, contaminants release of dredged and disposed material, air-water exchange, *E. coli* and benthic processes. It shall also simulate salinity. Salinity results simulated by hydrodynamic models and water quality models shall be demonstrated to be consistent.
2. The sediment transport module for assessing impacts of sediment loss due to marine works shall include the processes of settling, deposition and re-erosion. The values of the modelling parameters shall be agreed with EPD. Contaminants release and DO depletion during dredging and dumping shall be simulated by the model.
3. The thermal model shall be based on the flow field produced by the hydrodynamic model. It shall incorporate the physical processes of thermal / cooled water discharge and abstraction flow, buoyancy effect of the thermal plume, and surface heat exchange. Dispersion of biocides in the discharge shall also be simulated with appropriate decay rates.
4. The models shall at least cover the Hong Kong waters, the Pearl Estuary and the Dangan Channel to incorporate all major influences on hydrodynamic and water quality. A fine grid model may be used for detailed assessment of this study. It shall either be linked to a far field model or form part of a larger model by gradual grid refinement. The coverage of the fine grid model shall be properly designed such that it is remote enough so that the boundary conditions will not be affected by the project. The model coverage area shall be agreed with EPD.
5. In general, grid size at the area affected by the project shall be less than 400 meters in open waters and less than 75 meters around sensitive receivers. The grid shall also be able to reasonably represent coastal features existing and proposed in the project. The grid schematization shall be agreed with EPD.

Modelling Assessment

1. The assessment shall include the construction and operational phase of the Project. Where appropriate, the assessment shall also include maintenance dredging. Scenarios to be assessed shall cover the baseline condition and scenarios with various different options proposed by the Applicant in order to quantify the environmental impacts and improvements that will be brought about by these options. Corresponding pollution load, bathymetry and coastline shall be adopted in the model set up.
2. The assessment shall cover accidental fuel spillage associated with the operation of the Project. Potential locations, quantities and rates of spill shall be identified and quantified. The spill modelling shall cover combinations of different tides, wind and season conditions. The methodology for modelling spill and scenarios to be covered should be agreed with EPD.

3. Hydrodynamic, sediment transport, fuel spillage and thermal modules, where appropriate, shall be run for (with proper model spin up) at least a real sequence of 15 days spring-neap tidal cycle in both the dry season and the wet season.
4. Water quality module shall run for (with proper model spin up) a complete year incorporating monthly variations in Pearl River discharges, solar radiation, water temperature and wind velocity in the operational stage. Construction stage impacts, cooling water discharge and floating refuse and debris entrapment may be assessed by simulating typical spring-neap cycles in the dry and wet seasons.
5. For assessing temporary discharges via the emergency outfall, the Applicant shall estimate discharge loading, pattern and duration. The worst case scenario shall include discharge near slack water of neap tide. A period of at least 15 days spring-neap cycle in wet season, but long enough for recovery of the receiving water, shall be simulated. Detailed methodology shall be agreed with EPD.
6. The results shall be assessed for compliance of Water Quality Objectives. Any changes in hydrodynamic regime shall be assessed. Daily erosion / sedimentation rate shall be computed and its ecological impact shall be assessed.
7. The impact on all sensitive receivers shall be assessed.
8. Cumulative impacts due to other projects, activities or pollution sources within a boundary to the agreement of EPD shall also be predicted and quantified.

Requirements for Assessment of Waste Management Implication

The assessment of waste management implication shall cover the following:

1. Analysis of Activities and Waste Generation

- (i) The Applicant shall identify the quantity, quality and timing of the waste arising as a result of the construction and operation activities of the Project based on the sequence and duration of these activities, e.g. construction and demolition materials (C&DM), any dredged/excavated sediment/mud, chemical waste, floating refuse and other wastes which will be generated during construction and operation stages.
- (ii) The Applicant shall adopt appropriate design, general layout, construction methods and programme to minimize the generation of public fill/inert C&DM and maximize the use of public fill/inert C&DM for other construction works.

2. Proposal for Waste Management

- (i) Prior to considering the disposal options for various types of wastes, opportunities for reducing waste generation, on-site or off-site re-use and recycling shall be fully evaluated. Measures which can be taken in planning and design stages e.g. by modifying the design approach and in the construction stage for maximizing waste reduction shall be separately considered.
- (ii) The Applicant shall consider alternative project designs/measures to avoid/minimize floating refuse accumulation/entrapment and measures/proposals for the potential floating refuse problem. Regarding the potential trapping of floating refuse along the shoreline or mooring facilities of the Project, the Applicant shall estimate as far as practicable the amount of floating refuse to be found/trapped along the shoreline or mooring facilities of the Project in construction stage and after the completion of the Project. The Applicant shall develop an effective plan/design to avoid/minimize the trapping of floating refuse. If floating refuse is identified and needs to be dealt with, the Applicant shall propose appropriate measures to deal with this floating refuse in a proper and acceptable manner e.g. to collect, recycle, reuse, store, transport and dispose of.
- (iii) After considering the opportunities for reducing waste generation and maximizing re-use, the types and quantities of the wastes required to be disposed of as a consequence shall be estimated and the disposal methods/options for each type of wastes shall be described in detail. The disposal methods/options recommended for each type of wastes shall take into account of the result of the assessment in (v) below.
- (iv) The EIA report shall also state clearly the transportation routings and the frequency of the trucks/vessels involved, any barging point or conveyor system to be used, the stockpiling areas, the disposal outlets for the waste identified and the monitoring and audit system to prevent any sea dumping of waste or malpractice of waste disposal.

- (v) The impact caused by handling (including stockpiling, labelling, packaging and storage), collection, transportation and re-use/disposal of wastes shall be addressed in detail and appropriate mitigation measures shall be proposed. This assessment shall cover the following areas :
- potential hazard;
 - air and odour emissions;
 - noise;
 - wastewater discharge;
 - ecology; and
 - public transport.

3. Excavation/Dredging and Dumping

- (i) The Applicant shall identify and estimate the excavation/dredging, excavated/dredged sediment/mud transportation and disposal activities and requirements. Potential dumping ground to be involved shall also be identified. Appropriate field investigation, sampling and chemical and biological laboratory tests to characterize the sediment/mud concerned shall be conducted. The ranges of parameters to be analysed; the number, type and methods of sampling; sample preservation; chemical and biological laboratory test methods to be used shall be agreed with the Director (with reference to Section 4.4.2(c) of the TM) prior to the commencement of the tests and documented in the EIA report for consideration. The categories of sediment/mud which are to be disposed of in accordance with the Dumping at Sea Ordinance (DASO) shall be identified by both chemical and biological tests and their quantities shall be estimated. If the presence of contamination of sediment/mud which requires special treatment/disposal is confirmed, the Applicant shall identify appropriate treatment and/or disposal arrangement and demonstrate viability in consultation with relevant authorities.
- (ii) The Applicant shall identify and evaluate the best practical excavation/dredging methods to minimize dredging/excavation and dumping requirements based on the criterion that existing sediment/mud shall be left in place and not to be disturbed as far as possible.

Requirements for Ecological Impact Assessment (Terrestrial and Marine)

1. The ecological impact assessment shall examine the flora, fauna and other components of the ecological habitats within the study area. The aim shall be to protect, maintain or rehabilitate the natural environment. In particular, the Project shall avoid or minimise impacts on important ecological habitats and species including but not limited to :-
 - (i) recognized sites of conservation importance including but not limited to existing, planned and potential Marine Parks, Special Areas, Sites of Special Scientific Interest and Conservation Areas;
 - (ii) important ecological habitats or habitats with conservation interest including but not limited to horseshoe crab breeding and nursery grounds, mangroves, coral communities, intertidal, subtidal and benthic habitats; and
 - (iii) species of conservation importance including but not limited to Chinese White Dolphins, Finless Porpoises, Green Turtles, Whale Sharks, *Amphioxus* sp., Horseshoe Crabs, White-bellied Sea Eagle, seabirds and migratory birds.
2. The assessment shall identify and quantify as far as possible the potential ecological impacts associated with the Project, both directly by physical disturbance and indirectly by changes of water quality and hydrodynamic regime to the natural environment and the associated wildlife groups and habitats/species including its construction as well as subsequent operation, management and maintenance phase.
3. The assessment shall include the following major tasks:
 - (i) review the findings of relevant studies/surveys and collate the available information regarding the ecological characters of the assessment area;
 - (ii) evaluate the information collected, identify any information gap relating to the assessment of potential ecological impacts, and determine the ecological field surveys and investigations that are needed for impact assessments as required under the following sections.
 - (iii) carry out necessary ecological field surveys and investigations to verify the information collected, to fill the information gap and to fulfil the objectives of the EIA Study. The field surveys shall cover flora, fauna and any other habitats/species of conservation importance and shall include but not be limited to avifauna, intertidal, subtidal and benthic organisms and coral communities. In particular, the avifauna survey shall cover at least 12 months including both the wet and dry seasons;
 - (iv) establish the general ecological profile of the assessment area based on data of relevant previous studies/surveys and the results of the ecological field surveys and description of the characteristics of each habitat found. Major information to be provided shall include :
 - (a) description of the physical environment, including all recognized sites of conservation importance and other ecologically sensitive area, and assessment of whether these sites will be affected by the Project or not;

- (b) habitat maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats and species in the assessment area;
 - (c) ecological characteristics of each habitat type such as size, vegetation and/or substrate type, species present, dominant species found, species richness and abundance of major taxa groups, seasonal patterns, inter-dependence of the habitats and species, and presence of any features of ecological importance;
 - (d) representative colour photos of each habitat type and any important ecological features identified; and
 - (e) species found that are rare, endangered and/or listed under local legislation, international conventions for conservation of wildlife/habitats or red data books.
- (v) investigate and describe the existing wildlife uses of various habitats with special attention to those wildlife groups and habitats with conservation interest, including but not limited to the following:
- (a) coastal/marine waters;
 - (b) intertidal, subtidal and benthic organisms and communities (e.g. *Amphioxus* sp.);
 - (c) coral communities (e.g. the False pillow coral);
 - (d) mangroves;
 - (e) horseshoe crab breeding and nursery grounds;
 - (f) Whale Sharks, Green Turtles and their nesting and inter-nesting grounds;
 - (g) avifauna (e.g. White-bellied Sea Eagle and its breeding site and foraging ground, seabirds and migratory birds and their breeding/foraging grounds, etc.); and
 - (h) any other habitats / species identified as having special conservation interest by this EIA study
- (vi) use suitable methodologies and consider also any works activities from other projects reasonably likely to occur at the time, identify and quantify as far as possible any direct (e.g. loss of habitats due to various elements such as dredging, and other associated works of the Project), indirect (e.g. water qualities, hydrodynamics properties, underwater noise, glare, accidental spillage or leakage of natural gas, dangerous goods or chemicals and other disturbance generated by the construction and operational activities, etc), on-site, off-site, primary, secondary and cumulative ecological impacts on the wildlife groups and habitats identified such as destruction of habitats, reduction of species abundance/diversity, loss of feeding and breeding grounds, reduction of ecological carrying capacity and habitat fragmentation, disturbance due to the associated marine traffic, in particular the following:
- (a) habitat loss and disturbance to the intertidal, subtidal, benthic communities and coastal/marine waters;
 - (b) impacts to marine organisms due to underwater noise generated from construction (in particular piling) and operational activities;

- (c) impacts to marine organisms due to the regasification process (such as possible intake of seawater and the associated impingement and entrainment of fish and fish larvae, and discharge of cooled water with antifoulants) and mooring for LNG transfer (such as discharge of ballast water);
 - (d) impacts to intertidal, subtidal and benthic organisms during construction and operation phases due to potential changes in water quality, hydrodynamics properties and sedimentation rates;
 - (e) impacts to migratory species such as Green Turtles, Whale Sharks, White-bellied Sea Eagle, seabirds and migratory birds and other species of conservation interest due to various constructional and operational activities, in particular the effects of glare from light sources and gas flares and bird strike/collision;
 - (f) ecological impacts due to incidents (e.g. during typhoon) or accidents (e.g. vessel collision) of spillage or leakage of natural gas, dangerous goods or other chemicals; and
 - (g) cumulative impacts due to other planned and committed concurrent development projects at or near the Project area.
- (vii) evaluate ecological impact based on the best and latest information available during the course of the EIA study, using quantitative approach as far as practicable and covering construction and operation phases of the Project as well as the subsequent management and maintenance requirement of the Project;
 - (viii) recommend possible and practicable mitigation measures such as alternative location, alignment, design and operational mode of the Project and modification/change of construction methods to avoid, minimize and/or compensate for the adverse ecological impacts identified during construction and operation of the Project;
 - (ix) evaluate feasibility and effectiveness of the recommended mitigation measures and define the scope, type, location, implementation arrangement, resources requirement, subsequent management and maintenance of such measures;
 - (x) determine and quantify as far as possible of the residual ecological impacts after implementation of the proposed mitigation measures;
 - (xi) evaluate the severity and acceptability of the residual ecological impacts using well-defined criteria in Annex 8 of the TM and determine if off-site mitigation measures are necessary to mitigate the residual impacts by following the guidelines and requirements laid down in Annex 16 of the TM; and
 - (xii) review the need for and recommend any ecological monitoring programme required.
4. The assessment of impacts on marine mammals especially Finless Porpoises (*Neophocaena phocaenoides*) and Chinese White Dolphins (*Sousa chinensis*) shall include the following major tasks:

- (i) review and incorporate the findings of relevant studies including scientific and EIA studies and collate latest available information such as their occurrence, distribution, abundance, and the detected declining trends in Chinese White Dolphins in the past decade;
- (ii) evaluate the information collected and identify any information gap relating to the assessment of potential impacts on marine mammals;
- (iii) carry out necessary field surveys/investigations to verify the information collected, fill the information gaps identified, and to fulfil the objectives of the EIA study. The surveys/investigations shall include, but not be limited to, the following:
 - (a) marine mammal survey of at least 12 months (shipboard or land-based survey) to investigate their usage, especially in the area for the proposed FSRU facility and along the subsea gas pipelines; and
 - (b) underwater acoustic study covering both day-time and night-time period to collect data on the occurrence of marine mammals and their diel patterns within the Study Area.
- (iv) compile and present survey/investigation findings including previous relevant studies and surveys/investigations carried out under this study;
- (v) assess the direct and indirect impacts to marine mammals during the construction and operation phases of the Project, in particular the following:
 - (a) potential changes in their distribution, abundance, usage pattern in Hong Kong;
 - (b) impacts associated with the FSRU facilities and other infrastructure components, in particular the direct and permanent loss of habitat, habitat fragmentation, and reduction in ecological carrying capacity;
 - (c) impacts due to dredging (including maintenance dredging) and transportation and disposal of dredged sediments within Hong Kong;
 - (d) impacts due to change in marine traffic volume, distribution and pattern, in particular the increase in risk of vessel collision to marine mammals;
 - (e) disturbances due to underwater noise, including noise generated from piling and pipeline laying works, additional construction vessels during the construction phase, and long term increase in underwater noise caused by the regasification process and changes in marine traffic during the operation phase;
 - (f) impacts due to other possible associated works of the Project (e.g. re-alignment of the existing subsea utilities);
 - (g) impacts to marine mammals and their prey resources associated with the regasification process (such as possible intake of seawater and the associated impingement and entrainment of fish and fish larvae, and discharge of cooled water with antifoulants) and mooring for LNG transfer (such as discharge of ballast water);

- (h) impacts to marine mammals and their prey resources associated with changes in water quality/ hydrodynamics properties;
 - (i) risks of bioaccumulation of toxic contaminants released from the disturbed/ dredged sediment, or significant incidents or accidents of spillage or leakage of natural gas, dangerous goods or other chemicals;
 - (j) impacts to existing, planned and potential Marine Parks due to potential changes in water quality, hydrodynamic properties, marine traffic volume, underwater noise and discharge of ballast waters/cooled seawater containing antifoulants during construction and operation phases of the Project as well as the laying, maintenance and repairing of the subsea gas pipelines; and
 - (k) impacts of additional marine traffic (e.g. risk of vessel collision and underwater noise), disturbance due to underwater noise, marine dredging and piling work, other possible associated works (e.g. re-alignment of the existing subsea utilities), change in water quality/hydrodynamic properties, regasification process (e.g. possible intake of seawater and the associated impingement of entrainment of fish and fish larvae, and discharge of cooled water with antifoulants), intake and discharge of ballast water (e.g. possible intake of seawater and the associated impingement and entrainment of fish and fish larvae) and accidents of spillage or leakage of natural gas resulted from the Project on the functionality of the existing, planned and potential Marine Parks as protected areas for Finless Porpoises and Chinese White Dolphins.
- (vi) assess the overall cumulative ecological impacts due to this Project and any planned and on-going development projects (e.g. Development of the Integrated Waste Management Facilities Phase 1, Development of a 100MW Offshore Wind Farm in Hong Kong, Expansion of Hong Kong International Airport into a Three-Runway System, Hong Kong-Zhuhai-Macao Bridge Hong Kong Link Road, Potential Reclamation Site at Lung Kwu Tan);
- (vii) identify and recommend practicable mitigation measures for the adverse ecological impacts identified during construction and operation of the Project. In identification of applicable measures, the Applicant shall consider the feasibility and appropriateness of, including but not limited to, the following:
- (a) avoid locating the FSRU facility within the boundary of and minimize potential indirect impact/disturbance (e.g. through adopting a suitable buffer distance) to any existing, planned and potential Marine Parks;
 - (b) adopt construction methods with less disturbance to marine mammals; and
 - (c) use alternative antifoulants to minimize the generation of chlorinated organic compounds.
- (viii) evaluate feasibility and effectiveness of the recommended mitigation measures and define the scope, type, location, implementation arrangement, resources requirement, subsequent management and maintenance of such measures. Special attention shall be paid that, if night time work is required, mitigation measures that are effective to implement during day time may become impractical or

impossible (e.g. monitored exclusion zone by visual observation), and suitable mitigation measures specifically designed for night time work shall then be developed.

- (ix) evaluate the severity and acceptability of the overall residual ecological impact on marine mammals, after implementation of the mitigation measures as identified above; and
- (x) review the need for and recommend any marine mammal monitoring programme.

Requirements for Fisheries Impact Assessment

1. Existing information from relevant studies including scientific and EIA studies regarding the study area shall be reviewed. Based on the review results, the assessment shall identify data gap. The assessment shall determine the details of field surveys to collect adequate baseline information on adult fish and fish fry production. The surveys shall include but not limited to the following:
 - (i) adult fish production survey of at least nine months covering both wet and dry seasons to assess the abundance, composition and spatial distribution of fish within the study area;
 - (ii) ichthyoplankton and fish post larvae survey of at least nine months covering wet, dry and peak seasons to identify spawning and nursery areas important for commercial fisheries resources within/in vicinity of the study area; and
 - (iii) vessel survey of at least nine months covering both wet and dry seasons to assess fishing operations within the study area.
2. The Applicant shall recommend appropriate methodology (in particular sampling gear type and gear specification, number and location of sampling stations, and data analysis, etc.), duration and timing for the fisheries field surveys for agreement with the Director.
3. The fisheries impact assessment shall cover any potential direct/ indirect, on-site/off-site, short-term and long-term impacts on capture and culture fisheries, fisheries resources (adult and fry fish, eggs and larvae) and habitats (in particular spawning or nursery grounds) during the construction and operation phases of the Project.
4. The fisheries impact assessment shall provide the following information:-
 - (i) description of the physical environmental background;
 - (ii) description and quantification of the existing capture and culture fisheries production and activities;
 - (iii) description and quantification of the existing fisheries resources (adult and fry fish, eggs and larvae) and habitats (in particular spawning or nursery grounds);
 - (iv) identification of parameters (e.g. water quality parameters) including any potential toxic contaminants released from the dredged sediment and areas of fisheries importance (in particular any spawning and nursery grounds along the proposed alignment of submarine pipelines, within and in vicinity of the possible intake and outlet of seawater of the cooling system, the dredging areas, the mooring facilities and the piling activities, etc.) that are important to fisheries;
 - (v) prediction and evaluation of any direct/indirect, onsite/offsite impacts on fisheries during the construction and operation phases of the Project, in particular the following:
 - (a) impacts to fisheries (such as potential loss or disturbance of fishing grounds, fisheries resources, spawning or nursery grounds, water quality

- deterioration at sensitive receivers such as areas of high fish production, spawning or nursery grounds, fish culture zones or artificial reefs);
- (b) impacts due to dredging (including maintenance dredging), piling activities, induced marine transportation and disposal of dredged sediments on capture and culture fisheries production/operations, fisheries habitats (in particular spawning or nursery grounds) and fisheries resources (in particular fish eggs and fish larvae);
 - (c) impacts of water intake (in particular impingement and entrainment of fish, fish eggs and larvae) and discharge of cooled seawater containing antifoulants on fisheries resources (adult and fry fish, eggs and larvae) and production, and spawning or nursery grounds; and
 - (d) impacts due to activities of LNG carriers and FSRU vessel, discharge of thermal water/biocide, ballast water of the LNG carriers, accidental spillage or leakage of natural gas, dangerous goods and/or other chemicals on fisheries sensitive areas and fisheries resources such as fishing grounds, spawning and nursery grounds, adult and fry fish, eggs, and larvae.
- (vi) proposals of suitable methodologies for prediction and evaluation of the fisheries impacts and, if necessary, proposals of complementary laboratory testing in the methodologies;
 - (vii) evaluation of cumulative impacts on fisheries due to this Project and other planned and committed concurrent development projects at or near the assessment area;
 - (viii) proposals of practicable mitigation measures with details on justification, scope, programme, feasibility as well as staff and financial implications including those related to subsequent management and maintenance requirements of the measures; and
 - (ix) review for the need of monitoring during the construction and operation phases of the Project and, if necessary, proposal for a monitoring and audit programme.

Requirements for Visual Impact Assessment

1. The Applicant shall assess the visual impacts of the Project and the glare from the light sources of the Project. A system shall be derived for judging visual impact significance as required under the TM. Clear illustrations of visual impact assessment are required. The assessment shall include the following:
 - (i) identification and plotting of visual envelope of the Project;
 - (ii) identification of the key groups of existing and planned sensitive receivers within the visual envelope and their views at ground level, sea level and elevated vantage points;
 - (iii) evaluation of visual impacts, by taking into account the factors affecting the sensitivity of receivers (including value and quality of existing views, availability and amenity alternative views, type and estimated number of receiver population, duration of view and degree of visibility) and the magnitude of change of view (including compatibility of the Project with the surrounding landscape, seascape and planned setting, duration of impacts under construction and operation phases, scale of development, reversibility of change, viewing distance and potential blockage of view). The visual impacts of the Project with and without mitigation measures shall also be included so as to demonstrate the effectiveness of the proposed mitigation measures;
 - (iv) clear evaluations and explanation with supportive arguments of all relevant factors considered in arriving the significance thresholds of visual impacts.
2. Annotated illustration such as coloured perspective drawings, plans and section/elevation diagrams, oblique aerial photographs, photographs taken at vantage points and computer-generated photomontage, particularly from but not limited to the most severely affected vantage points shall be adopted to illustrate the significance of the visual impacts of the Project in four stages i.e. existing conditions, unmitigated impacts at Day 1, mitigated impacts at Day 1 and residual impact at Year 10. Options of design schemes shall be illustrated with photomontages to show the visual impact on the surrounding areas. True colour samples may be requested if found necessary and appropriate. Technical details in preparing the illustration, which may need to be submitted for verification of accuracy of the illustration shall be recorded. Computer graphics shall be compatible with Microstation DGN file format.

**Requirements for Cultural Heritage Impact Assessment
- Marine Archaeological Investigation**

Marine Archaeological Investigation (MAI)

1. The assessment area for the potential archaeological impact shall include areas affected by the marine and dredging works of the Project.
2. The Applicant shall engage a qualified marine archaeologist to conduct a marine archaeological review based on the best available information to identify whether there is any potential existence of sites or objects of cultural heritage within the seabed that will be affected by the marine works of the Project, whether the identified issues can be mitigated and whether there is a need for more detail investigation. The review shall take into account the scope and nature of proposed marine works, the results of previous marine archaeological investigations, the dredging history and other diving records, etc.
3. If marine archaeological potential is identified and the need for further investigation is confirmed, a MAI shall be carried out to ascertain the archaeological value of the affected seabed area. The guidelines for MAI are set out in Appendix I-1.
4. The Applicant shall propose a programme of investigation, including the scope of works, methodology and time schedule, etc. for agreement with the Director. The MAI shall be carried out by a qualified marine archaeologist who shall obtain a licence from the Antiquities Authority under the provision of the Antiquities and Monuments Ordinance, Cap. 53. If significant archaeological remains are discovered, mitigation measures shall be designed and implemented in consultation with the Antiquities and Monuments Office (AMO).

Guidelines for Marine Archaeological Investigation (MAI)

The standard practice for MAI should consist of four separate tasks, viz. (1) Baseline Review, (2) Geophysical Survey, (3) Establishing Archaeological Potential and (4) Remote Operated Vehicle (ROV)/Visual Diver Survey/Watching Brief. Marine archaeologists should make reference to the standard and guidance of the Institute for Archaeologists and English Heritage to carry out MAI.

1. Baseline Review

- 1.1 A baseline review should be conducted to collate the existing information in order to identify the potential for archaeological resources and, if identified, their likely character, extent, quality and value.
- 1.2 The baseline review will focus on known sources of archive data. It will include:
 - (a) Geotechnical Engineering Office (GEO) – the Department holds extensive seabed survey data collected from previous geological research.
 - (b) Marine Department, Hydrographic Office - the Department holds a substantial archive of hydrographic data and charts.
 - (c) The Royal Naval Hydrographic Department in the UK – the Department maintains an archive of all survey data collected by naval hydrographers.
 - (d) Relevant government departments should be consulted in order to obtain the information of dredging history (if any) on the proposed project area. Area for sand dredging, mud disposal and allocated marine borrow area within Hong Kong should also be considered during the review.
- 1.3 The above data sources will provide historical records and more detailed geological analysis of submarine features which may have been subsequently masked by more recent sediment deposits and accumulated debris.

2. Geophysical Survey

- 2.1 Extensive geophysical survey of the study area should deploy high resolution boomer, side scan sonar, an echo sounder and high resolution multi beam sonar. The multi beam data must be presented as processed digital terrain models to facilitate the archaeological analysis. The data received from the survey would be analysed in detail to provide:
 - (a) exact definition of the areas of greatest archaeological potential.
 - (b) assessment of the depth and nature of the seabed sediments to define which areas consist of suitable material to bury and preserve archaeological material.
 - (c) detailed examination of the boomer and side scan sonar records to map anomalies in and on the seabed which may be archaeological material.
 - (d) detailed examination of the multi beam sonar data to assess the archaeological potential of the sonar contacts.

3. Establishing Archaeological Potential

- 3.1 The data examined during Task 1 and 2 will be analysed to provide an indication of the likely character and extent of archaeological resources within the study area. This would facilitate formulation of a strategy for investigation.
- 3.2 The results would be presented as a written report and charts. If there is no indication of archaeological material there would be no need for further work.
- 3.3 Charts should be presented at the most appropriate scale and show each survey contact. Its dimensions and exact location should also be shown.

4. Remote Operated Vehicle (ROV)/Visual Diver Survey/Watching Brief

- 4.1 Subject to the outcome of Tasks 1, 2 and 3, accepted marine archaeological practice would be to plan a field evaluation programme to acquire more detailed data on areas identified as having archaeological potential. The areas of archaeological interest can be inspected by ROV or divers. ROV or a team of divers with both still and video cameras would be used to record all seabed features of archaeological interest.
- 4.2 Owing to the heavy marine traffic in Hong Kong, the ROV/visual diver survey may not be feasible to achieve the target. If that is the case, an archaeological watching brief is the most appropriate way to monitor the dredging operations in areas of identified high potential to obtain physical archaeological information.
- 4.3 A sampling strategy for an archaeological watching brief would be prepared based on the results of Tasks 1, 2 and 3 to focus work on the areas of greatest archaeological potential. Careful monitoring of the dredging operations would enable immediate identification and salvage of archaeological material. If archaeological material is found, the AMO should be contacted immediately to seek guidance on its significance and appropriate mitigation measures would be prepared.
- 4.4 If Task 4 is undertaken, the results would be presented in a written report with charts.

Report

- 5. Five copies of the final report should be submitted to the AMO for record.

Implementation Schedule

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location/Duration of measures/ Timing of completion of measures	Implementation Agent	Implementation Stage **				Relevant Legislation & Guidelines
					Des	C	O	Dec	

** Des=Design; C=Construction; O=Operation; Dec=Decommissioning

Requirements for EIA Report Documents

1. The Applicant shall supply the Director with the following number of copies of the EIA report and the executive summary:
 - (i) 40 copies of the EIA report and 50 copies of the executive summary (each bilingual in both English and Chinese) as required under Section 6(2) of the EIAO to be supplied at the time of application for approval of the EIA report.
 - (ii) When necessary, addendum to the EIA report and the executive summary submitted in item (i) above as required under Section 7(1) of the EIAO, to be supplied upon advice by the Director for public inspection.
 - (iii) 20 copies of the EIA report and 50 copies of the executive summary (each bilingual in both English and Chinese) with or without Addendum as required under Section 7(5) of the EIAO, to be supplied upon advice by the Director for consultation with the Advisory Council on the Environment.
2. In addition, to facilitate public inspection of EIA report via EIAO Internet Website, the Applicant shall provide electronic copies of both the EIA report and executive summary prepared in Hyper Text Markup Language (HTML) (version 4.0 or later) and in Portable Document Format (PDF version 1.3 or later), unless otherwise agreed by the Director. For the HTML version, a content page capable of providing hyperlink to each section and sub-section of the EIA report and executive summary shall be included in the beginning of the document. Hyperlinks to figures, drawings and tables in the EIA report and executive summary shall be provided in the main text from where respective references are made. Graphics in the report shall be in interlaced GIF format unless otherwise agreed by the Director.
3. The electronic copies of the EIA report and the executive summary shall be submitted to the Director at the time of application for approval of the EIA report.
4. When the EIA report and the executive summary are made available for public inspection under Section 7(1) of the EIAO, the content of the electronic copies of the EIA report and the executive summary must be the same as the hard copies and the Director shall be provided with the most updated electronic copies.
5. To promote environmentally friendly and efficient dissemination of information, both hardcopies and electronic copies of future EM&A reports recommended by the EIA study shall be required and their format shall be agreed by the Director.