

ENVIRONMENTAL IMPACT ASSESSMENT ORDINANCE (CAP. 499)
SECTION 5 (7)

ENVIRONMENTAL IMPACT ASSESSMENT STUDY BRIEF NO. ESB-260/2013

PROJECT TITLE : **IMPROVEMENT OF YEUN LONG TOWN NULLAH (TOWN CENTRE SECTION)**
(hereinafter known as the "Project")

NAME OF APPLICANT : **DRAINAGE SERVICES DEPARTMENT**
(hereinafter known as the "Applicant")

1. BACKGROUND

- 1.1 An application for Permission to Apply Directly for Environmental Permit (DIR) under section 5(11) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by the Applicant on 7 March 2013 with a project profile (No. PP-485/2013) (the Project Profile). The Director considers that DIR is not appropriate for the Project because there is a need to conduct an EIA Study to assess and evaluate various environmental issues and impacts arising from the project, including, among others, the ecological impacts.
- 1.2 The Project comprises improvement works for the Town Centre Section of the Yuen Long Town Nullah by intercepting the polluted dry weather flow for treatment at the Yuen Long Sewage Treatment Works and re-using the treated water to provide scenic water flow for flushing the Town Centre Section of the Yuen Long Nullah, thereby alleviating the odour nuisance and improving the water quality. The main components of the Project include the following:
- (i) A Dry Weather Flow Interception system to collect all polluted dry weather flow in the Town Centre Section of the Yuen Long Town Nullah by 600mm to 1050mm diameter pipelines;
 - (ii) Interception and diversion of dry weather flow at the upstream of the Yuen Long Town Nullah near the junction of Kung Um Road and Tai Shu Ha Road East by a 600mm diameter pipeline;
 - (iii) A pumping station at the downstream of the Yuen Long Town Nullah with an installed capacity of 18000m³/ day to convey the intercepted dry weather flow to the Yuen Long Sewage Treatment Works;
 - (iv) An underground storage chamber with 400m³ capacity near the junction of Kung Um Road and Tai Shu Ha Road East and twin 450mm diameter rising mains to deliver the treated effluent from the Yuen Long Sewage Treatment Works to the storage chamber; and
 - (v) Beautification and landscaping works by reconstructing and modifying about

800m of low flow channel, concrete bed and walls in the existing Yuen Long Town Nullah.

The Project location is shown in Appendix A.

1.3 The Project consists of the following designated projects under Part I, Schedule 2 of the EIAO:

- (1) Item F.3(b) – *A sewage pumping station with an installed capacity of more than 2000m³ per day and a boundary which is less than 150m from an existing or planned – (i) residential area; (ii) place of worship; (iii) educational institution; (iv) health care institution; (v) site of special scientific interest; (vi) site of cultural heritage; (vii) bathing beach; (viii) marine park or marine reserve; (ix) fish culture zone; or (x) seawater intake point.*
- (2) Item F.4 – *An activity for the reuse of treated sewage effluent from a treatment plant.*
- (3) Item I.1(b) – *A drainage channel or river training and diversion works which discharges or discharge into an area which is less than 300m from the nearest boundary of an existing or planned (i) site of special scientific interest; (ii) site of cultural heritage; (iii) marine park or marine reserve; (iv) fish culture zone; (v) wild animal protection area; (vi) coastal protection area; or (vii) conservation area.*

1.4 Pursuant to section 5(7)(a) of the EIAO, the Director of Environmental Protection (the Director) issues this 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 related activities that take place concurrently. This information will contribute to decisions by the Director on :

- (i) the acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;
- (ii) the conditions and requirements for the design, construction and operation of the Project to mitigate against adverse environmental consequences; 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/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 emission sources and determine the significance of impacts on sensitive receivers and potential affected uses;
- (iv) to identify and quantify any potential losses or damage to flora, fauna and wildlife habitats;
- (v) to identify and evaluate any potential landscape and visual impacts and to propose measures to mitigate these impacts;
- (vi) to propose the provision of infrastructure or mitigation measures to minimize pollution, environmental disturbance and nuisance during the construction and operation of the Project;
- (vii) to investigate the feasibility, effectiveness and implications of the proposed mitigation measures;
- (viii) 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 potentially affected uses;
- (ix) to identify, assess 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;
- (x) to design and specify environmental monitoring and audit requirements; and
- (xi) 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 scope the key issues of the EIA study and to specify the environmental issues that are required to be reviewed and assessed in the EIA report. The Applicant has to demonstrate in the EIA report that 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 proposed in the Project Profile and mentioned in section 1.2 of this EIA Study Brief. The EIA study shall address the likely key issues described below, together with any other key issues identified during the course of the EIA study:

- (i) potential air quality and noise impacts on the sensitive receivers during construction and operation of the Project;
- (ii) potential water quality impacts on water system(s) including the Deep Bay Water Control Zone and relevant water sensitive receivers (e.g. Shan Pui River), during construction and operation of the Project;
- (iii) potential waste management issues and impacts during construction and operation of the Project;
- (iv) potential ecological impact during construction and operation of the Project;
- (v) potential landscape impact arising from the Project and potential visual impact arising from the above-ground structures of the Project;
- (vi) potential cumulative impacts of the Project, through interaction or in combination with other existing, committed and planned projects in the vicinity of the Project.

3.3 Consideration of Alternatives

3.3.1 Need of the Project

The Applicant shall provide information on the need of the Project, including the purpose and objectives of the Project, and describe the scenarios with and without the Project.

3.3.2 Consideration of Alternative Design and Layout

The Applicant shall present in the EIA report the consideration of alternative design and layout of the Project. Factors or constraints affecting the design and layout of the Project shall be stated.

3.3.3 Consideration of Alternative Construction Methods and Sequences of Works

Taking into consideration of the combined effect with respect to the severity and duration of the construction impacts to the affected sensitive receivers, the EIA study

shall explore different construction methods and sequences of works of the Project with a view to avoiding or minimizing adverse environmental impacts during construction of the Project. A comparison of the environmental benefits and disbenefits of applying different construction methods and sequences of works shall be included in the EIA study.

3.4 Technical Requirements

The Applicant shall conduct the EIA study to address the environmental aspects of the Project as described in section 3.2 above. The assessment shall be based on the best and latest information available during the course of the EIA study. The Applicant shall include in the EIA report details of the construction and operational programme and the methodologies for assessing the environmental impacts of the Project. The Applicant shall clearly state in the EIA report the time frame and works programmes of the Project and other concurrent projects, and assess the cumulative environmental impacts from the Project and the interacting projects as identified in the EIA study.

The EIA study shall include the following technical requirements on specific impacts.

3.4.1 Air Quality Impact

- 3.4.1.1 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.
- 3.4.1.2 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 be based on the best available information at the time of the assessment.
- 3.4.1.3 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.
- 3.4.1.4 The Applicant shall evaluate the likely odour impact that may arise from the construction and associated activities of the Project, and propose suitable measures to control/ minimize potential odour nuisance.
- 3.4.1.5 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 and odour emissions.

3.4.2 Noise Impact

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

3.4.2.2 The assessment area for the noise impact assessment shall generally include areas within 300m from the boundary of the Project site. Subject to the agreement of the Director, the assessment area could be reduced accordingly if the first layer of noise sensitive receivers (NSRs), closer than 300m from the outer Project limit, provides acoustic shielding to those receivers at distances further away from the Project. The assessment area shall be expanded to include NSRs at distances over 300m from the Project which are affected by the construction and operation of the Project. NSRs shall be included and assessed in the noise impact assessment.

3.4.2.3 The noise impact assessment for construction and operation of the Project shall follow the detailed technical requirements given in Appendix B.

3.4.3 Water Quality Impact

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

3.4.3.2 The study area for the water quality impact assessment shall cover the Deep Bay Water Control Zone as designated under the Water Pollution Control Ordinance (Cap 358) and water sensitive receivers in the vicinity of the Project. 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.

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

3.4.4 Waste Management Implication and Land Contamination

3.4.4.1 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.

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

3.4.4.3 The Applicant shall follow the guidelines for evaluating and assessing potential land contamination issue as stated in Section 3.1 of Annex 19 of the TM.

3.4.4.4 The assessment of the potential land contamination issue shall follow the detailed requirements given in Appendix D.

3.4.5 Ecological Impact (Terrestrial and Aquatic)

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

3.4.5.2 The assessment area for the purpose of this ecological impact assessment shall include areas within 500m distance from the boundary of the Project and any other areas likely to be impacted by the Project. For aquatic ecology, the assessment area shall be the same as the water quality impact assessment described in section 3.4.3.

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

3.4.6 Landscape and Visual Impacts

3.4.6.1 The Applicant shall follow the criteria and guidelines as stated in Annexes 10 and 18 of the TM 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 the landscape and visual impacts.

3.4.6.2 The assessment area for landscape impact assessment shall include all areas within a 100m distance from the site boundary of the Project. The assessment area for the visual impact assessment shall be defined by the visual envelope of the Project.

3.4.6.3 The landscape and visual impact assessments for construction and operation of the Project shall follow the detailed technical requirements given in Appendix F.

3.4.7 Summary of Environmental Outcomes

3.4.9.1 The EIA report shall contain a summary of key environmental outcomes arising from the EIA study, including environmental benefits of the Project and the environmental protection measures recommended, population and environmentally sensitive areas protected, recommended environmentally friendly designs, key environmental problems avoided and any compensation areas included.

3.4.8 Environmental Monitoring and Audit (EM&A) Requirements

- 3.4.8.1 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, define the scope of EM&A requirements for the Project in the EIA study.
- 3.4.8.2 Subject to the confirmation of the EIA study findings, the Applicant shall follow the guidelines for an EM&A programme as stated in Annex 21 of the TM.
- 3.4.8.3 The Applicant shall prepare a Project Implementation Schedule in the form of a checklist as shown in Appendix G of this EIA study brief. It shall contain 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. REPORT 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 supply the Director with hard and electronic copies of the EIA report and the executive summary in accordance with the requirements given in Appendix H. The Applicant shall, upon request, make additional copies of EIA report/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 Applicant for this EIA study brief during the course of the 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-485/2013), 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 the additional issues, if any, that the EIA study must also address. If the changes to the Project fundamentally alter the key scope of the EIA study brief, the Applicant shall apply

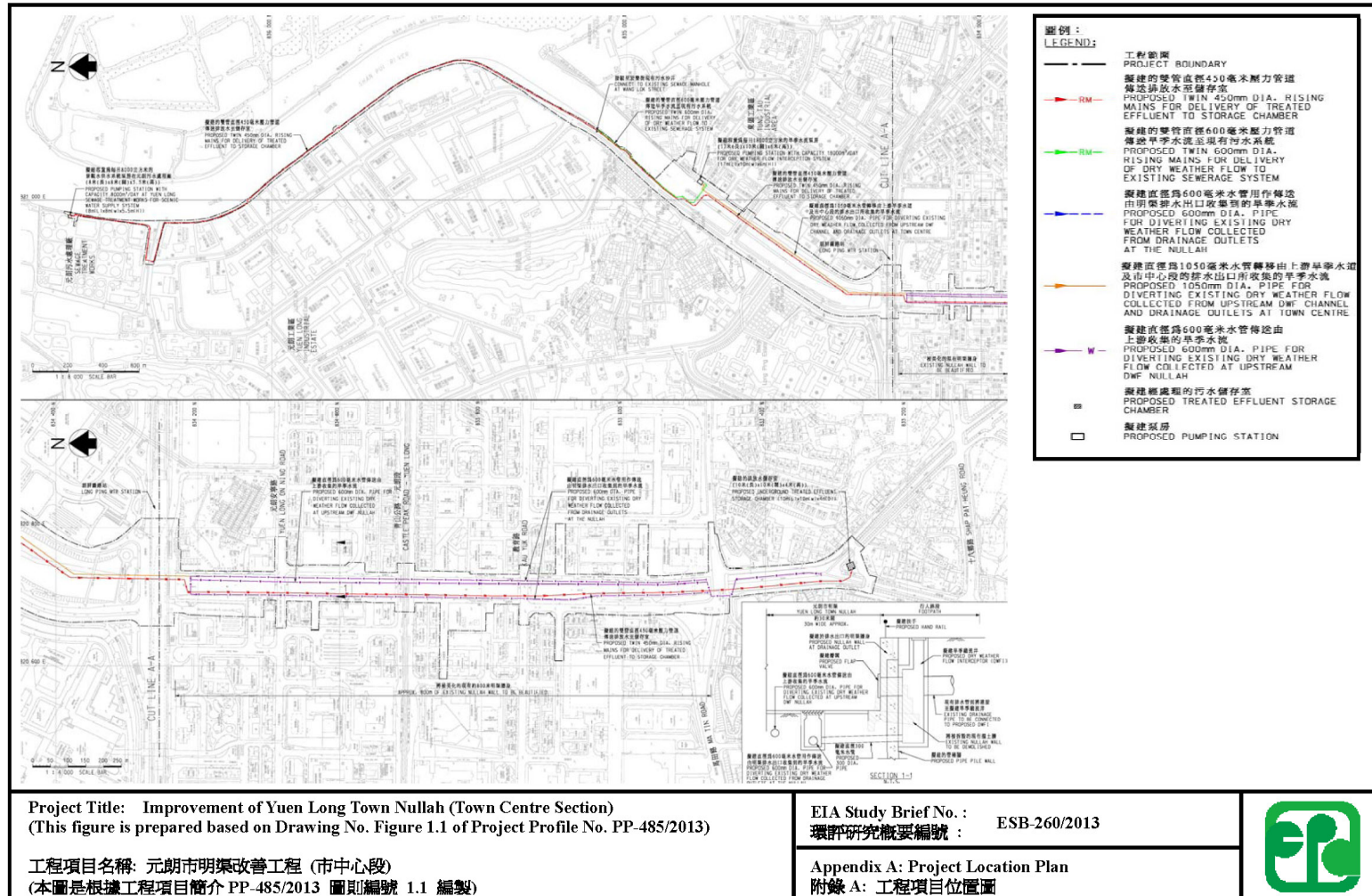
to the Director for a fresh EIA study brief.

--- END OF EIA STUDY BRIEF ---

March 2013

Environmental Assessment Division

Environmental Protection Department



Requirements for Noise Impact Assessment

The noise impact assessment shall include the following:

1. Provision of Background Information

The Applicant shall provide background information relevant to the Project, including relevant previous or current studies.

2. Identification of Noise Sensitive Receivers

(a) The Applicant shall refer to Annex 13 of the TM when identifying the NSRs. The NSRs shall include existing NSRs and planned/committed noise sensitive developments and uses earmarked on the relevant Outline Zoning 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. Photographs of existing NSRs shall be appended to the EIA report.

(b) The Applicant shall select assessment points to represent the identified NSRs for carrying out quantitative noise assessment described below. A map showing the locations and descriptions such as name of building, use, and floor of the selected assessment points shall be given. For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant planning parameters to work out representative site layouts for operational noise assessment purpose.

3. Provision of an Emission Inventory of the Noise Sources

The Applicant shall provide an inventory of noise sources including representative construction equipment for the purpose of carrying out the construction noise assessment and fixed plant equipment for the purpose of carrying out the operational noise assessment. Confirmation of the validity of the inventory shall be obtained from the relevant government departments/authorities and documented in the EIA report.

4. Construction Noise Assessment

(a) The Applicant shall carry out assessment of noise impact from construction (excluding percussive piling) of the Project during daytime, i.e. 7am to 7pm, on weekdays other than general holidays in accordance with methodology in paragraphs 5.3 and 5.4 of Annex 13 of the TM. The criteria in Table 1B of

Annex 5 of TM shall be adopted in the assessment.

- (b) To minimize the construction noise impact, alternative construction methods to replace percussive piling and blasting shall be proposed as far as practicable.
- (c) If the unmitigated construction noise levels are found exceeding the relevant criteria, the Applicant shall propose practicable direct mitigation measures (including movable barriers, enclosures, quieter alternative methods, rescheduling and restricting hours of operation of noisy tasks) to minimize the impact. If the mitigated noise levels still exceed the relevant criteria, the duration of the noise exceedance at the affected NSRs shall be given.
- (d) The Applicant shall, as far as practicable, formulate a reasonable construction programme so that no work will be required in restricted hours as defined under the Noise Control Ordinance (NCO). In case the Applicant needs to evaluate whether construction works in restricted hours as defined under the NCO are feasible or not in the context of programming construction works, reference should be made to relevant technical memoranda issued under the NCO. Regardless of the results of construction noise impact assessment for restricted hours, the Noise Control Authority will process Construction Noise Permit (CNP) application, if necessary, based on the NCO, the relevant technical memoranda issued under the NCO, and the contemporary conditions/situations. This aspect shall be explicitly stated in the EIA report.
- (e) The assessment shall cover the cumulative noise impacts due to the construction works of the Project and other concurrent projects identified during the course of the EIA study.

5. Operation Noise Assessment of Fixed Noise Sources

(a) Assessment of Fixed Source Noise Levels

The Applicant shall calculate the expected noise using standard acoustics principles. Calculations for the expected noise shall be based on assumed plant inventories and utilization schedule for the worst-case scenario. The Applicant shall calculate noise levels taking into account correction of tonality, impulsiveness and intermittency in accordance with Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites issued under the NCO. The Applicant shall provide justification for the sound power level of each type of fixed noise sources.

(b) Presentation of Noise Levels

The Applicant shall present the existing and future noise levels in L_{eq} (30 min) at the NSRs at various representative floor levels (in m P.D.) on tables and plans of suitable scale. A quantitative assessment at the NSRs for the fixed noise sources shall be carried out and compared against the criteria set out in Table 1A of Annex 5 of the TM.

(c) Proposals for Noise Mitigation Measures

The Applicant shall propose direct technical remedies within the Project limits in situations where the predicted noise level exceeds the criteria set out in Table 1A of Annex 5 of the TM to protect the affected NSRs.

6. Assessment of Side Effects and Constraints

The Applicant shall identify, assess and propose means to minimize any side effects and to resolve any potential constraints due to the inclusion of any recommended direct mitigation measures.

7. Evaluation of Constraints on Planned Noise Sensitive Developments/Land uses

For planned noise sensitive uses which will still be affected even with practicable direct mitigation measures in place, the Applicant shall propose, evaluate and confirm the practicability of additional measures within the planned noise sensitive uses and shall make recommendations on how these noise sensitive uses will be designed for the information of relevant parties.

The Applicant shall take into account agreed environmental requirements/ constraints identified by the EIA study to assess the development potential of concerned sites which shall be made known to the relevant parties.

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. Possible impacts due to the effluent discharge, overflow of sewage pumping stations, biocide discharge, and site runoff shall include changes in hydrology, flow regime, sediment erosion and deposition patterns, morphological change of riverbed/seabed profile, water quality and sediment quality. 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 be limited to the following:
 - (i) the water quality impacts of the site run-off 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 Practice Note 1/94;
 - (ii) the assessment on operation stage shall have regard to the frequency, duration, volume and flow rate of the discharges and its pollutant;
 - (iii) the water quality impacts during construction and operation stages of the Project;
 - (iv) the water quality impacts of temporary, accidental and emergency discharges at the pumping stations and sewage treatment works during construction and operation stages of the Project.
4. The Applicant shall address water quality impacts due to the construction phase and operational phase 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 might be affected by the Project;

- (ii) characterize water quality of the water systems and sensitive receivers, which might 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 landuse 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 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, flow regimes of water bodies, catchment types or areas, erosion or sedimentation due to the Project and any other hydrological changes in the study 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;
- (viii) provide an emission inventory on the quantities and characteristics of those existing and future pollution sources in the study area. Field investigation and laboratory test, shall be conducted as appropriate to fill relevant information gaps;
- (ix) predict and quantify the water quality impacts arising from those alternations and changes identified in (vi) to (viii) 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 within the study area that may have a bearing on the environmental acceptability of the Project;

- (xi) analyze 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 infrastructure upgrading or provision, contingency plan, water pollution prevention and mitigation measures to be implemented during construction and operation stages, including emergency sewage discharge in the case of sewage treatment works and sewage pumping stations, so as to reduce the water quality impacts to within standards. Effluent generated from the Project shall require appropriate collection, treatment and disposal to ensure that there is no net increase in pollution load to Deep Bay. Requirements to be incorporated in the Project contract document shall also be proposed;
- (xiii) investigate and develop best management practices to reduce storm water and non-point source pollution as appropriate;
- (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;
- (xv) evaluate, predict and characterize the effluent characteristics of the Project with different levels of treatment and disinfection processes by making reference to anticipated performance of the treatment and disinfection process, the finding of previous studies, and conducting additional samplings and tests.

Appendix D**Requirements for Assessment of Waste Management Implication
and Land Contamination**

The assessment of waste management implication and land contamination shall cover the following:

1. Analysis of Activities and Waste Generation

The Applicant shall identify the quantity, quality and timing of the wastes arising as a result of the construction and operation activities of the Project based on the sequence, duration, method and process of these activities, e.g. any dredged/excavated sediment/mud, construction and demolition materials, floating refuse, sewage sludge, screening, grits, chemical waste and other wastes which will be generated during construction and operation stages. The Applicant shall adopt appropriate design, general layout, construction methods and programme to minimize the generation of public fill/inert construction and demolition (C&D) materials and maximize the use of public fill/inert C&D materials 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 evaluated. Measures that can be taken in the 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) 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. The disposal methods/options recommended for each type of wastes shall take into account the result of the assessment in Section 2 (iv) below;
- (iii) The EIA report shall state the transportation routings and the frequency of the trucks/vessels involved, any barging point or conveyor system to be used, the stockpiling areas and the disposal outlets for the wastes identified; and
- (iv) The impact caused by handling (including stockpiling, labelling, packaging & storage), collection, transportation and re-use/disposal of wastes shall be addressed 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. Land Contamination

- (i) The Applicant shall identify land lots and sites within the Project boundary which, due to their past or present land uses, are potentially contaminated sites. A detailed account of the present activities and past land use history in relation to possible land contamination shall be provided.
- (ii) The list of potential contaminants which are anticipated to be found in these potentially contaminated sites shall be provided and relevant remediation options shall be presented.

4. ! Dredging/Excavation, Filling and Dumping

- (i) The Applicant shall identify and quantify as far as practicable of all dredging/excavation, fill extraction, filling, reclamation, sediment/mud transportation and disposal activities and requirements. Potential fill source and dumping ground to be involved shall also be identified. Field investigation, sampling and chemical and biological laboratory tests to characterize the sediment/mud concerned shall be conducted as appropriate. The ranges of parameters to be analyzed; 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 document in the EIA report for consideration. The categories of sediment/mud which are to be disposed of in accordance with a permit granted under 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 any serious contamination of sediment/mud which requires special treatment/disposal is confirmed, the Applicant shall identify the most appropriate treatment and/or disposal arrangement and demonstrate its feasibility. The Applicant shall provide supporting document, such as agreement by the relevant facilities management authorities, to demonstrate the viability of any treatment/disposal plan.
- (ii) The Applicant shall identify and evaluate the best practical dredging/excavation methods to minimize dredging/excavation and dumping

requirements and demand for fill sources 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 Aquatic)

1. In the ecological impact assessment, the Applicant shall examine the flora, fauna and other components of the ecological habitats within the assessment area. The aim shall be to protect, maintain or rehabilitate the natural environment. In particular, the Project shall avoid or minimise impacts on recognised sites of conservation importance and other ecologically sensitive areas such as the Mai Po Inner Deep Bay Ramsar Site, Wetland Conservation Area (WCA) and Wetland Buffer Area (WBA) as defined in Town Planning Board Guideline 12b and mudflats / mangrove along the embankment and at confluence of Kam Tin River and Shan Pui River. The assessment shall identify and quantify as far as possible the potential ecological impacts arising from the Project including its construction and operation phases as well as the subsequent management and maintenance of the proposals.
2. The assessment shall include the followings:
 - (i) Review of the findings of relevant studies/surveys and collection of the available information regarding the ecological characters of the assessment area;
 - (ii) Evaluation of information collected and identification of any information gap relating to the assessment of potential ecological impact, and determine the ecological field surveys and investigations that are needed for an impact assessment as required in the following sections;
 - (iii) Carrying out necessary field surveys and investigations to verify the information collected in (i) above, to fill the information gaps identified and to fulfill the objectives of the EIA study;
 - (iv) Establishment of the general ecological profile of the assessment area based on data of relevant previous studies/surveys and results of the ecological field surveys, if any, 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 areas, and assessment of whether these sites/areas 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/species in the assessment area;

- (c) ecological characteristics of each habitat type such as size, type, species present, dominant species found, species diversity and abundance, community structure, seasonal pattern, ecological value and 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) Investigation and description of the existing wildlife uses of the various habitats with special attention to those wildlife groups and habitats with conservation interests, including:
- (a) Natural and man-made wetland habitats including mudflat, mangrove, drainage channel, fishpond and others;
 - (b) migratory and overwintering waterbirds roosting and/or feeding in the wetland habitats above;
 - (c) breeding egrets and herons foraging in the wetland habitats above; and
 - (d) any other habitats or species identified as having special conservation interests by this study.
- (vi) Using suitable methodology and considering also other projects in the vicinity of the Project area reasonably likely to occur at the same time, identification and quantification as far as possible of any direct, indirect, on-site, off-site, primary, secondary and cumulative ecological impacts, reduction of species abundance/diversity, loss of feeding grounds, reduction of ecological carrying capacity, habitat fragmentation, and in particular the followings :
- (a) noise, glare and other human disturbance to wildlife in particular waterbirds and sensitive wetland habitats in the vicinity such as mudflats/mangroves along the embankments and at the confluence of Kam Tin River and Shan Pui River as well as fishpond/wetland habitats at Nam Sang Wai and WCA during construction and operation phases;
 - (b) indirect ecological impacts due to changes in the water quality, hydrodynamics properties, sedimentation rates and pattern as well as hydrology as a result of surface run-off, discharge of treated effluent and any associated disinfection activities, temporary sewage overflow, accidental discharge of untreated sewage, etc. in the drainage channels,

fishponds and other wetland habitats in the assessment area during construction and operation phases.

- (vii) Evaluation of 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) Recommendations for practicable mitigation measures (such as modification/change of locations and alignment of the Project, construction methods and/or programme) to avoid, minimize and/or compensate for the adverse ecological impacts identified during construction and operation of the Project;
- (ix) Evaluation of the feasibility and effectiveness of the recommended mitigation measures and definition of the scope, type, location, implementation arrangement, resources requirement, subsequent management and maintenance of such measures;
- (x) Determination and quantification as far as possible of the residual ecological impacts after implementation of the proposed mitigation measures;
- (xi) Evaluation of the significance and acceptability of the residual ecological impacts by making reference to the criteria in Annex 8 of the TM; and
- (xii) Review of the need for and recommendation on any ecological monitoring programme required.

Appendix F**Requirements for Landscape and Visual Impact Assessments**

1. The Applicant shall review relevant plan(s) and/or studies which may identify areas of high landscape value. Any guidelines on landscape and urban design strategies and frameworks that may affect the appreciation of the Project shall also be reviewed. The aim is to gain an insight to the future outlook of the area affected so as to assess whether the Project can fit into the surrounding setting. Any conflict with the statutory town plan(s) and any published land use plans shall be highlighted and appropriate follow-up action shall be recommended.
2. The Applicant shall describe, appraise, analyse and evaluate the existing and planned landscape resources and character of the assessment area. A system shall be derived for judging landscape and visual impact significance. Annotated oblique aerial photographs and plans of suitable scale showing the baseline landscape character areas and landscape resources and mapping of impact assessment shall be extensively used to present the findings of impact assessment. Descriptive text shall provide a concise and reasoned judgment from a landscape and visual point of view. The sensitivity of the landscape framework and its ability to accommodate change shall be particularly focused on. The Applicant shall identify the degree of compatibility of the Project with the existing and planned landscape setting, recreation and tourism related uses, and scenic spot. The landscape impact assessment shall quantify the potential landscape impact as far as possible so as to illustrate the significance of such impacts arising from the proposed development. Clear mapping of the landscape impact is required. A Broad Brush Tree Survey shall be carried out and the impacts on existing trees shall be addressed. Cumulative landscape and visual impacts of the Project with other committed and planned developments shall be assessed.
3. The Applicant shall assess the visual impacts of the Project. Clear illustration including mapping of visual impact is 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 with regard to views from ground level, sea level and elevated vantage points;
 - (iii) description of the visual compatibility of the Project with the surrounding and the planned setting, and its obstruction and interference with the key views of the study areas;
 - (iv) identification of the severity of visual impacts in terms of distance, nature and

number of sensitive receivers. The visual impacts of the Project with and without mitigation measures shall be included so as to demonstrate the effectiveness of the proposed mitigation measures;

4. The Applicant shall evaluate the merits of preservation in totality, in parts or total destruction of existing landscape and the establishment of a new landscape character area. In addition, alternative location, layout, design, built-form and construction method that will avoid or reduce the identified landscape and visual impacts shall be evaluated for comparison before adopting other mitigation or compensatory measures to alleviate the impacts. The mitigation measures proposed shall not only be concerned with damage reduction but shall also include consideration of potential enhancement of existing landscape and visual quality. The Applicant shall recommend mitigation measures to minimize adverse effects identified above, including provision of a master landscape plan.
5. The mitigation measures shall also include the preservation of vegetation, transplanting trees in good condition and value, provision of screen planting, re-vegetation of disturbed lands, compensatory planting, design of structure, provision of finishes to structure, colour scheme and texture of material used and any measures to mitigate the impact on the existing and planned land use and visually sensitive receivers. Parties shall be identified for the on going management and maintenance of the proposed mitigation works to ensure their effectiveness throughout the construction phase and operation phase of the Project, associated works, supporting facilities and essential infrastructures. A practical programme and funding proposal for the implementation of the recommendation measures shall be provided.
6. Annotated illustration materials such as colour perspective drawings, plans and section/elevation diagrams, annotated oblique aerial photographs, photographs taken at vantage points, and computer-generated photomontage shall be adopted to fully illustrate the landscape and visual impacts of the proposed pumping station which is a newly added above ground structure. In particular, the landscape and visual impacts of the Project with and without mitigation measures from representative viewpoints, particularly from views of the most severely affected visually sensitive receivers (i.e. worst case scenario), shall be properly illustrated in existing and planned setting at four stages (existing condition, Day 1 with no mitigation measures, Day 1 with mitigation measures and Year 10 with mitigation measures) by computer-generated photomontage so as to demonstrate the effectiveness of the proposed mitigation measures. Computer graphics shall be compatible with Microstation DGN file format. The Applicant shall record the technical details in preparing the illustration, which may need to be submitted for verification of the accuracy of the illustration.

Appendix G

Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve

Appendix H**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) 30 copies of the EIA report and 30 copies of the bilingual (in both English and Chinese) executive summary 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 bilingual (in both English and Chinese) executive summary 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. To facilitate public inspection of EIA report via EIAO Internet Website, the Applicant shall provide electronic copies of both the EIA report and the executive summary prepared in HyperText Markup Language (HTML) (version 4.0 or later) and in Portable Document Format (PDF version 1.3 or later). For the HTML version, a content page capable of providing hyperlink to each section and sub-section of the EIA report and the executive summary shall be included in the beginning of the document. Hyperlinks to figures, drawings and tables in the EIA report and the 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.
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.