

Appendix B-1**Criteria for Water Quality Impact Assessment**

1. For sea water cooling or marine mud dredging, the study area for water quality impact assessment shall cover the Western Buffer, Victoria Harbour, Junk Bay and Eastern Buffer Water Control Zones as designated under the Water Pollution Control Ordinance (WPCO). For land decontamination activities, the study area for water quality impact assessment shall be 300m from the boundary of the Project.
2. The Applicant shall take into account and include likely different construction stages or sequences, and different operation stages of the Project in the assessment. The assessment shall have regard to the frequency, duration, volume and flow rate of the discharges and its pollutant. Essentially the assessment shall address the following:
 - (i) Collection and review of background information on the existing and planned water system(s) and their respective catchments and sensitive receivers which might be affected by the Project during construction and operation;
 - (ii) Characterization of water and sediment quality of the water system(s) and respective catchments and sensitive receivers which might be affected by the Project during construction and operation based on existing information or appropriate site survey and tests;
 - (iii) Identification and analysis of all existing and planned future activities and beneficial uses related to the water system(s) and identification of all water sensitive receivers. The Applicant shall 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;
 - (iv) Identification of pertinent water and sediment quality objectives and establishment of other appropriate water and sediment quality criteria or standards for the water system(s) and all the sensitive receivers in (i) above;
 - (v) Review of the construction sequences and methods, and operation of the Project to identify any alteration of existing water courses and the associated water system(s), and ground water hydrology;
 - (vi) Identification and quantification of all likely water pollution sources and loading, including sources during dredging and filling, through appropriate site investigation and tests, generated by the Project and discharged to water courses and the associated water system(s);
 - (vii) Establishment and provision of a pollution load inventory on the quantities and characteristics of all existing and likely future water pollution sources identified above. Field investigation and laboratory tests shall be conducted as appropriate to fill in any major information gaps;
 - (viii) Identification, assessment and evaluation of any potential impacts arising from

tunnel / seepage drainage and track runoff. Appropriate measures shall be recommended to reduce the identified impacts arising during operation. The assessment should include the volume of anticipated wastewater / water seepage to be discharged from the stations / tunnel so as to facilities assessment in accordance with Section 6.5 in Annex 14 of the TM;

- (ix) Should dredging be required, evaluation and quantification of the possible impacts arising from the dredging works should be carried out. The Applicant shall identify clearly the nature, extent and rate of the dredging works. Appropriate laboratory tests such as elutriate tests (USACE) and sediment samples to simulate and quantify the degree of mobilization of various contaminations such as metals, ammonia, trace organic contaminants such as PCBs, PAHs, TBT and chlorinated pesticides into the water column during dredging.
- (x) Prediction and quantification of impacts on the affected water system(s) and the sensitive receivers due to those alterations and changes identified in (v) above and the pollution sources identified in (vi) above. The Applicant shall conduct full scale mathematical modeling, simulating situation during various construction phases of the Project, assessing both the local and global effects on flow regime, erosion, resuspension and sediment dispersion and water quality due to the interim and ultimate alteration of shoreline and bathymetry as a result of dredging marine sediment. The modeling assessment should take into account the additional pollution loading and oxygen demand exerted by sediment disturbed and any fill materials. The mathematical modeling requirements are set out in Appendix A2. Suitable mud dredging and disposal methods should be recommended to reduce any adverse effects found. Cumulative impacts due to other dredging, filling or dumping activities within a boundary around the assessment area to be agreed with the Director, shall be predicted and quantified.
- (xi) Derivation of water pollution prevention and mitigation measures to be implemented during the dredging and/or filling stages so as to reduce the water and sediment quality impacts to within standards.
- (xii) Assessment and evaluation of any potential impacts arising from thermal and biocide discharges from the chilling plants of railway stations during operation stage shall be carried out quantitatively by mathematical modeling methods to be agreed with the Director if sea water cooling for air conditioning is used and the flow rates of the spent cooling water effluent streams exceed the flow bands covered under the Technical Memorandum on Effluent Standards stipulated under the Water Pollution Control Ordinance. The mathematical modeling requirements are set out in Appendix A2. Appropriate measures shall be recommended to reduce the identified impacts.
- (xiii) Evaluation and quantification of any residual impacts on the affected water system(s) and sensitive receivers with regard to the appropriate water and sediment quality objectives, standards or guidelines.