Annex A. Environmental Mitigation Implementation Schedule

Annex A Project Implementation Schedule

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Water Quality						
3.8	2	**Mitigation Measures for Dredging** Although adverse water quality impact is not predicted during the construction phase, implementation of the following mitigation measures is recommended to minimise the potential SS impact from dredging activities: • Dredging shall be carried out by closed grab dredger to minimize release of sediment and other contaminants during dredging; • The maximum production rate for dredging from the seabed for installation of the submarine gas pipelines shall not be more than 4,000m^3 per day (and no more than 1 closed grab dredger); and • Deployment of frame type silt curtain to fully enclose the grab while dredging works are in progress. An illustration of a typical configuration of frame type silt curtain is shown in Figure 3.10. The frame type silt curtain shall be designed to enclose local pollution caused by the grab dredger and suspended by a steel frame mounted on the grab dredger and floating on water. This frame type silt curtain shall be fabricated from permeable, durable, abrasion resistant membrane like geotextiles and be mounted on a floating boom structure. The frame type silt curtain shall also extend to the seabed to cover the entire water column. Steel chain or ballast shall be attached to the bottom of the silt curtain. Mid-ballast may be added as necessary. The structure of the silt curtain shall be maintained by metal grids. The frame type silt curtain shall be capable or reducing sediment loss to outside by a factor of 4 (or about 75%).	Construction Contractor	Construction Work Sites (Along the alignment of dredging)	During Marine Dredging works	WQO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
3.8	2	**Other Good Site Practices for Dredging** Other good site practices that shall be undertaken during dredging includes: • all vessels shall be sized so that adequate clearance is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; • all barges / dredgers used shall be fitted with tight fitting seals to their bottom openings to prevent leakage of material; • construction activities shall not cause foam, oil, grease, scum, litter or other objectionable matter to be present on the water within the site or dumping grounds; • barges or hopper shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation; and • before commencement of dredging works, the holder of the Environmental Permit shall submit detailed proposal of the design and arrangement of the frame type silt curtain to EPD for approval.	Construction Contractor	Construction Work Sites (Along the alignment of dredging)	During Marine Dredging works	WQO
3.8	2	**Effluent from Hydrostatic/ Commissioning Tests of the Gas Pipeline System** For hydrostatic testing of gas pipelines, the gas pipelines would be filled with potable water (a nearly incompressible liquid) and examined for leaks or permanent changes in shape with a specified test pressure. The test would be carried out at room temperature and dosing of chemicals into the water for testing is not required. Water used for testing shall be reused as far as possible (e.g. water spray for dust suppression on site). To ensure compliance with the standards for effluent discharged into the inshore waters or marine waters of Victoria Harbour WCZ as shown in Tables 9a and 9b of the TM-DSS, sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m^3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and suited to applications where the influent is pumped.	Construction Contractor	Construction Work Sites (General)	During Hydrostatic Tests	Practice Note for Professional Persons with regard to site drainage (ProPECC PN 1/94) and WQO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
3.8	2	**Surface Runoff, Sewage and Wastewater from Construction Activities** Appropriate measures shall be implemented to control runoff and prevent high loads of SS from entering the marine environment. Proper site management is essential to minimise surface runoff and sewage effluents. • Construction site runoff shall be prevented or minimised in accordance with the guidelines stipulated in the EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). All discharges from the construction site shall be controlled to comply with the standards for effluents discharged into the Victoria Harbour WCZ under the TM-DSS. Good housekeeping and stormwater best management practices, as detailed below, shall be implemented to ensure all construction runoff complies with WPCO standards and no unacceptable impact on the WSRs as a result of construction of the proposed submarine gas pipelines; • Sedimentation tanks with sufficient capacity, constructed from pre-formed individual cells of approximately 6 to 8 m^3 capacities, are recommended as a general mitigation measure which can be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and suited to applications where the influent is pumped; • Manholes (including newly constructed ones) shall always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the storm runoff being directed into foul sewers; • All vehicles and plant shall be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and located wheel washing bay shall be provided at every site exit, and wash-water shall have sand and silt settled out and removed at least on a weekly basis to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road shall be paved with sufficient backfill toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains;	Construction Contractor	Construction Work Sites (General)	Construction period	Practice Note for Professional Persons with regard to site drainage (ProPECC PN 1/94) and WQO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		• Precautions shall be taken at any time of year when rainstorms are likely. Actions shall be taken when a rainstorm is imminent or forecast. Actions to be taken during or after rainstorms are summarised in Appendix A2 of ProPECC PN 1/94. Particular attention shall be paid to the control of silty surface runoff during storm events, particularly for areas located near steep slopes; • Fuel tanks and storage areas shall be provided with locks and be located on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching the coastal waters of the Victoria Harbour and Western and Eastern Buffer WCZs; • Portable chemical toilets shall be used to handle construction workforce sewage prior to discharge to the existing trunk sewer. Sufficient numbers of portable toilets shall be provided by a licensed contractor to serve the construction workers. The Contractor should also be responsible for waste disposal and maintenance practices.				
Waste Management						
4.6	3	**Good Site Practices** Adverse impacts related to waste management are not expected to arise, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include: • Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site • Training of site personnel in proper waste management and chemical handling procedures, separation of chemical wastes with appropriate treatment which is mentioned in Section 4.6.5 • Provision of sufficient waste disposal points and regular collection of waste • Barges filled with dredged sediment shall be towed away immediately for disposal. In doing so, odour is not anticipated to be an issue to distant sensitive receivers	Construction Contractor	Construction Work Sites (General)	Construction period	Waste Disposal Ordinance (Cap.354); Waste Disposal (Chemical Wastes) (General) Regulation (Cap 354) and ETWBTC No. 15/2003, Waste Management on Construction Site

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		• Well planned delivery programme for offsite disposal such that adverse impact from transporting sediment material is not anticipated				
		• Well maintained PME should be operated on site • Regular cleaning and maintenance of the drainage systems for construction of the landing points • Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers				
4.6	3	**Waste Reduction Measures** Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include: • Sort C&D material from demolition and decommissioning of the existing facilities to recover recyclable portions such as metals; • Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force; • Proper storage and site practices to minimise the potential for damage or contamination of construction materials; and • Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.	Construction Contractor	Construction Work Sites (General)	Construction period	

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.6	3	**C&D Material** In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials shall be reused on-site as backfilling material and for landscaping works as far as practicable. Surplus C&D material generated from excavation works shall be disposed of at public fill reception facilities for other beneficial uses. Other mitigation requirements are listed below: • A Waste Management Plan shall be prepared;	Construction Contractor	Construction Work Sites (General)	Construction period	ETWB TCW No. 31/2004
		• A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) shall be proposed; and • In order to monitor the disposal of C&D material and solid wastes at public filling facilities and landfills, and to control fly-tipping, a trip-ticket system (e.g. ETWB TCW No. 31/2004) shall be included.				
4.6	3	**General Refuse** General refuse shall be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from C&D material. Preferably an enclosed and covered area shall be provided to reduce the occurrence of 'wind blown' light material.	Construction Contractor	Construction Work Sites (General)	Construction period	
4.6	3	**Chemical Waste** Good quality containers compatible with the chemical wastes shall be used, and incompatible chemicals shall be stored separately. Appropriate labels shall be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the approved Chemical Waste Treatment Centre, or another licensed facility.	Construction Contractor	Construction Work Sites (General)	Construction period	Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes, Waste Disposal (Chemical Waste) (General) Regulation

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.6	3	**Marine Dredged Sediment** During transportation and disposal of the dredged marine sediments, the following measures shall be taken to minimise potential impacts on water quality: • Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material. Excess material shall be cleaned from the decks and exposed fittings of barges and dredgers before the vessel is moved; • Monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the EPD; and	Construction Contractor	Construction Work Sites (Along the alignment of dredging)	During Marine Dredging works	ETWB TCW No. 34/2002
		• Barges or hopper barges shall not be filled to a level that would cause the overflow of materials or sediment laden water during loading or transportation. • The use of 300m^3 geosynthetic container, with outer woven fabric tensile strength of 200 kN/m and seam strength of 140 kN/m for effective method for contained disposal which meets ETWB TCW No. 34/2002 requirements for assuring negligible loss of contaminants to marine environment during disposal.				
		• Allocation of marine disposal sites and all necessary permits shall be applied from relevant authorities for disposal of dredged sediment. Project Proponent will obtain confirmation from CEDD/Marine Fill Committee (MFC) on the disposal options before commencement of the Project.				
Marine Ecology						
5.7	4	Placement of a second silt curtain between the dredger and the To Kwa Wan breakwater. The silt curtain shall be 75m long. This curtain shall be moved along with the dredger as the work progresses. The curtain shall be arranged so that at least 15m of the curtain shall extend past the dredger in each direction. This curtain shall remain in a suitable position between the dredger and the corals until the dredger is 250m from the corals.	Construction Contractor	Proposed dredging near To Kwa Wan breakwaters	Construction period	EIAO-TM
Hazard to Life						

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
7.6.3.1	6	• Proper general traffic management measures. • Minimisation of works activity footprint – dredging and backfilling. • Safety provision during dredging and backfilling. • Liaison with relevant Government Departments before and during construction stage. • Requirements during the submarine pipe pulling.	Construction Contractor	Construction Work Sites	Construction period	
7.6.3.2	6	Risk mitigation measures to prevent the damage of submarine pipeline during operation will be adopted. They are listed as follows: 1. The submarine gas pipeline will be covered by armour rock, damage from anchor drop could be prevented.	Construction Contractor	Construction Work Sites	Construction period	
Landscape						
Table 8.2	7	Screening of construction works by hoardings/noise barriers around Works area in visually unobtrusive colours, to screen Works.	Construction Contractor	Construction Work Sites	Construction period	EIAO-TM
Table 8.2	7	Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material (in earth tone).	Construction Contractor	Construction Work Sites	Construction period	EIAO-TM
Table 8.2	7	Ensure no run-off into the harbour adjacent to the site.	Construction Contractor	Construction Work Sites	Construction period	EIAO-TM
Table 8.3	7	The design and finish of the gas pigging station will be aesthetically compatible with the surroundings.	Construction Contractor	Proposed pigging stations	Operation period	Approved planning permission applications No.A/K9/240 and A/H8/403 under S16 of the TPO
Table 8.3	7	Trellises will be constructed to screen the exposed pipes inside the proposed pigging stations.	Construction Contractor	Proposed pigging stations	Operation period	Approved planning permission applications No.A/K9/240 and A/H8/403 under S16 of the TPO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Table 8.3	7	A planting strip of 1.5m width will be reserved in front of the boundary wall of the proposed To Kwa Wan pigging station.	Construction Contractor*	Proposed To Kwa Wan pigging station	Operation period	Approved planning permission application No.A/K9/240 under S16 of the TPO
Table 8.3	7	A 300mm wide planting strip will be provided at the seafront side along the boundary fence within the proposed North Point pigging station.	Construction Contractor	Proposed North Point pigging station	Operation period	Approved planning permission application No.A/H8/403 under S16 of the TPO
Table 8.3	7	A 300mm wide planting strip together with a 2m high visual barrier inside the existing fence will be provided on the east boundary along Hoi Yu Street at North Point.	Construction Contractor	Proposed North Point pigging station	Operation period	Approved planning permission application No.A/H8/403 under S16 of the TPO
Cultural Heritage						
9.8	8	A Monitoring Brief shall be conducted as set out in Appendix H2 of the EIA. This can be done in parallel with the monitoring of barge loading as set out in section 4.6.	Construction Contractor	Construction Work Sites	Construction period	EIA Report
Noise						
10.6	9	**Construction Noise Impact from Test before Backfilling and Hydrostatic/ Commissioning Test** The total maximum allowable SWL of the test before backfilling and hydrostatic/ commissioning test is ranged from 112-126 dB(A) at different location and period, the Contractor shall strictly follow the specification listed above to meet the noise criteria and closely liaise with the schools nearby before carrying out the activities. Noise mitigation measures including the use of movable noise barriers and/ or noise enclosure to block the direct line of sight to the receivers, installation of mufflers and/ or silencers on the machine(s) should be implemented if necessary.	Construction Contractor	Construction Work Sites (Landmain work)	Construction period	PN 2/93 Noise from Construction Activities & EIAO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
10.7	9	**Using Quiet PME** The use of quiet PME recognized by the Noise Control Authority for the purpose of CNP application can effectively reduce the noise generated from the construction plants. Quiet PME are construction plants and equipments that are notably quieter, more environmental friendly and efficiently. The noise level reduction ranges from 5 – 10 dB(A) depending on the type of equipment used. The Contractor should note the required procedures involved in application of the QPME. A list of QPME recommended is list in **Table 10.11** of the EIA report.	Construction Contractor	Construction Work Sites (Along the alignment of dredging and landmain works)	Construction period	PN 2/93 Noise from Construction Activities & EIAO
10.7	9	**Using Movable Noise Barriers** Movable noise barriers to be erected near to the construction plants would reduce the noise levels for commonly 5 – 10 dB(A) depending on the types of items of PME and materials of the barriers. It is recommended that the Contractor should screen noisy works and noise from stationary items of PME whenever practicable.	Construction Contractor	Construction Work Sites (Landmain work)	Construction period	PN 2/93 Noise from Construction Activities & EIAO
10.7	9	**Good Site Practices** Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures shall be followed during construction: • The Contractor shall adopt the Code of Practice on Good Management Practice to Prevent Violation of the Noise Control Ordinance (Chapter 400) (for Construction Industry) published by EPD; • The Contractor shall observe and comply with the statutory and non-statutory requirements and guidelines;	Construction Contractor	Construction Work Sites (Along the alignment of dredging and landmain works)	Construction period	PN 2/93 Noise from Construction Activities & EIAO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		• Before commencing any work, the Contractor shall submit to the Engineer Representative for approval the method of working, equipment and noise mitigation measures intended to be used at the site; • The Contractor shall devise and execute working methods to minimise the noise impact on the surrounding sensitive uses, and provide experienced personnel with suitable training to ensure that those methods are implemented; • Unused equipment shall be turned off. Number of operating PME shall be kept to a minimum and the parallel use of noisy equipment / machinery shall be avoided; • Regular maintenance of all plant and equipment; and • Material stockpiles and other structures shall be effectively utilised as noise barriers, where practicable.				
Construction Dust						
11.5	10	**Mitigation Measures for Fugitive Dust** To mitigate fugitive dust impact, all dust control measures recommended in the Air Pollution Control (Construction Dust) Regulation, where applicable, shall be implemented. Relevant dust control measures include: • The works area for site clearance shall be sprayed with water before, during and after the operation so as to maintain the entire surface wet; • Restricting heights from which materials are to be dropped, as far as practicable to minimise the fugitive dust arising from unloading/ loading; • Immediately before leaving a construction site, all vehicles shall be washed to remove any dusty materials from the bodies and wheels. However, all spraying of materials and surfaces should avoid excessive water usage; • Where a vehicle leaving a construction site is carrying a load of dusty materials, the load shall be covered entirely by clean impervious sheeting to ensure that the dusty materials will not leak from the vehicle;	Construction Contractor	Construction Work Sites (General	Construction period	EIAO-TM and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		• Any stockpile of dusty materials shall be covered entirely by impervious sheeting; and/or placed in an area sheltered on the top and 4 sides; and • All dusty materials shall be sprayed with water immediately prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet.				

* According to the approved planning permission application for the To Kwa Wan gas pigging station under Section 16 of the Town Planning Ordinance, a planting strip of 1.5m width will be reserved in front of the boundary wall to further soften the physical appearance of the To Kwa Wan gas pigging station. As the gas pigging station will be located within the future Hoi Sham Park Extension, plant species shall be selected to match the surrounding planting theme. The details of the planting strips and its construction and maintenance arrangement will be liaised and agreed between the Project Proponent and relevant government departments. Parties of the OM3 shall be subject to the conditions under the land grant for the pigging station. The Project Proponent will implement and maintain the approved landscaping and plantations works of the strip until the handover of the works to the management and maintenance authority of the future waterfront promenade.