

### 3.0 ENVIRONMENTAL LEGISLATION, STANDARDS AND GUIDELINES

#### 3.1 Environmental Impact Assessment Ordinance

3.1.1 The Technical Memorandum issued under Section 16 of the Environmental Impact Assessment Ordinance sets out the principles, procedures, guidelines, requirements and criteria for the technical content of environmental impact assessments and for deciding whether a designated project is environmentally acceptable. Definitions of what constitute sensitive receivers for different environmental parameters are also provided. The criteria for evaluating environmental impacts has been followed for this EIA.

#### 3.2 Air Quality

##### Construction Phase

3.2.1 Air quality is regulated through Annex 4 of the Technical Memorandum on EIA Process (TMEIA) which specified compliance with the Air Pollution Control Ordinance, 1983 Cap. 311. This provides, inter alia, statutory Air Quality Objectives (AQO) for each Air Control Zone in the Territory. The associated Air Quality Objectives are provided in Table 3.1.

**Table 3.1: Hong Kong Air Quality Objectives**

Pollutant	Concentration <sup>o</sup> Fg/m <sup>3</sup> Averaging Time				
	1 Hour (ii)	8 Hours (iii)	24 Hours (iii)	3 Months (iv)	1 Year (iv)
Sulphur Dioxide	800		350		80
Total Suspended Particulates			260		80
Respirable Suspended Particulates (v)			180		55
Nitrogen Dioxide	300		150		80
Carbon Monoxide	30,000	10,000			
Photochemical Oxidants (as ozone (vi))	240				
Lead				1.5	
(i) Measured at 298°K (25°C) and 101.325 KPa (one atmosphere). (ii) Not to be exceeded more than three times per year. (iii) Not to be exceeded more than once per year. (iv) Arithmetic means. (v) Respirable Suspended Particulates means suspended particulates in air with a nominal aerodynamic diameter of 10 micrometers and smaller. (vi) Photochemical oxidants are determined by measurements of ozone only.					

Source : Air Pollution Control Ordinance

- 3.2.2 In addition to the Air Quality Objectives, the TMEIA also stipulates that a maximum hourly average level of 500 Fg/m<sup>3</sup> of Total Suspended Particulates (TSP) should not be exceeded at the boundary of any construction works.

### **Operational Phase**

- 3.2.3 The only air pollutant to be considered during the operation of the Project is odour from the pumping stations. Odour is regulated through Annex 4 of the TMEIA which stipulates that odour levels must meet 5 odour units based upon an averaging time of 5 seconds. For the purposes of the odour assessment, hydrogen sulphide gas (H<sub>2</sub>S) has been used as an indicator substance, being the primary cause of odour nuisance, and 1 odour unit for H<sub>2</sub>S is represented by 0.5 ppb.

## **3.3 Noise**

### **Construction Noise Criteria During Non-restricted Hours**

- 3.3.1 The noise generated by the construction of the Project during the non-restricted daytime hours (07:00-19:00) will be assessed with reference to Table 1B of Annex 5 of the TMEIA, as shown in Table 3.2.

**Table 3.2: Recommended Construction Noise Levels (Non-restricted Hours)**

<b>Noise Sensitive Receiver</b>	<b>Noise Level L<sub>eq</sub>(30 min) dB(A)</b>
Dwelling	75
School	70 (Normal school hours) 65 (During examination)

### **Construction Noise Criteria During Restricted Hours**

- 3.3.2 Due to close proximity of residents to the proposed works, construction works during restricted hours are not anticipated. However, should works be found to be necessary during the restricted hours, it will be the responsibility of the Contractor to apply for a Construction Noise Permit (CNP). Despite any description or assessment made in this EIA Report on construction noise aspects, there is no guarantee that a CNP will be issued for the project construction. The Noise Control Authority will consider a well justified CNP application for construction works within restricted hours, as guided by the relevant Technical Memoranda issued under the Noise Control Ordinance. The Noise Control Authority will take into account of contemporary conditions/situations of adjoining land uses and any previous complaints against construction activities at the site before making the decision on granting a CNP. Nothing in this EIA Report shall bind the Noise Control Authority in making the decision. If a CNP is to be issued, the Noise Control Authority shall include in it any condition that is considered fit and failure to comply with any such conditions will lead to cancellation of the CNP and prosecution action under the NCO. In addition, it is not anticipated that percussive piling works will be required during the construction of the project.

### **Operational Phase**

3.3.3 The only noise source during the operational phase will be the noise from the pumping station pump. The criteria for noise generated during operation is based upon the location of the sensitive receivers in the form of an Air Sensitivity Rating (ASR) and the relative affect of Influencing Factors in the form of industrial areas and major roads. The ASRs for different types of noise sensitive receiver are shown in Table 3.3 below.

**Table 3.3: Area Sensitivity Rating for Sensitive Receivers for Operational Noise**

Type of Area	Degree affected by Influencing Factor		
	Not Affected	Indirectly Affected	Directly Affected
Rural areas, including country parks or village type developments	A	B	B
Low density residential area consisting of low rise or isolated high rise developments	A	B	B
Urban Area	B	C	C
Areas other than above	B	B	C

3.3.4 The acceptable noise levels (ANLs) for NSRs with ASR-A and ASR-B are shown below in Table 3.4 below.

**Table 3.4: Acceptable Noise Levels**

Time Period	Acceptable Noise Level	
	ASR-A	ASR-B
Day (0700 to 1900)	60	65
Evening (1900 to 2300)		
Night (2300 to 0700)	50	55

3.3.5 Annex 5 of the TMEIA stipulates that all fixed noise sources should be at least 5 dB(A) below the appropriate ANL as shown above. This would reduce the ANL for ASR-A and ASR-B to 55 and 60 dB(A) for day and evening and 45 and 50 dB(A) for night time noise respectively.

## **3.4 Water Quality**

### **Water Quality Objectives**

3.4.1 The construction and operation of the Project will be required to comply with the environmental standards and guidelines for surface and marine waters as specified in Annex 6 of the TMEIA which states that the Water Quality Objectives defined under the Water Pollution Control Ordinance must be complied with. The regulations defined in the Water Pollution Control Ordinance are implemented through the process of assignment of Beneficial Uses (BU) to Water Control Zones (WCZ) and the Water Quality Objectives (WQO) associated with each BU. The WQO are controlled use related water quality parameters to which are assigned statistical values or permissible deviations from ambient background. The project is located within the North Western WCZ.

#### **Inland Waters - Surface Waters**

3.4.2 Beneficial Uses for surface fresh waters have been assigned into four main groups.

- (i) Group A abstraction for potable water supply; these include all waters within water gathering grounds and within the boundaries of the country parks.
- (ii) Group B irrigation; these are mainly in the agricultural areas of the New Territories.
- (iii) Group C pond fish culture; these are waters passing through areas where there are large numbers of fish ponds.
- (iv) Group D general amenity and secondary contact recreation; these are waters generally large enough to allow secondary contact recreation, those draining urban and semi urban areas and those draining to the sea at gazetted bathing beaches.

3.4.3 In addition to these uses there are the more general uses of preservation of aquatic life and use for storm water channels. Their quality requirements would equate to Groups B, C and D respectively.

3.4.4 The Study Area falls within the North Western Waters WCZ and the WQOs for 'other inland' waters in the North Western WCZ are set in terms of:

C	pH -	range of 6-9 units
C	Suspended Solids -	# 25mg/L
C	Dissolved Oxygen -	\$ 4mg/L
C	Chemical Oxygen Demand -	# 30mg/L
C	Biochemical Oxygen Demand (5 day)-	# 5mg/L
C	Unionised Ammonia -	0.021 mg/L

3.4.5 The maintenance of the surface water quality in order to satisfy the WQO and meet the requirements of the BU is controlled by the "Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters" which prescribes effluent discharge standards for the four water Classes. The effluent standards are related to the volume of effluent being discharged.



### **Inland Waters - Ground Water**

3.4.6 Hong Kong is underlain by granite and as such there is little useable ground water. Where ground water is abstracted it could be used for any of the four Groups of usage defined above and hence would need to meet the WQO for that particular Group.

### **Marine Waters**

3.4.7 Eight BUs have been identified for the North Western Waters WQZ in which the project is located. A description of each of the BUs is given in Table 3.5. The WQO values are generally defined as annual depth averaged values or percentiles. However, there may be large magnitude variations in the short term which may have an impact on sensitive receivers but have little influence on the annual values.

**Table 3.5: Beneficial Uses Applicable to the North Western Waters WCZ**

<b>BU</b>	<b>Beneficial Use</b>
BU1	A source of food for human consumption
BU2	A resource for commercial fisheries and shell fisheries
BU3	A habitat for marine life and a resource for human exploitation
BU4	For bathing
BU5	For secondary contact recreation such as diving, sailboard and dinghy sailing
BU6	For domestic and industrial purposes
BU7	For navigation and shipping and use of officially approved and endorsed sheltered harbours and typhoon shelters as temporary havens
BU8	For aesthetic enjoyment

Note: BU1 is maintained by the application of the WQO directly to the food substance and not the water from which the food was taken. Consequently there are no defined parameters in the marine environment which are controlled.

3.4.8 WQOs expressed in terms of concentrations for particular quality parameters have been set to ensure that water quality is suitable for the assigned BUs. The water quality parameters which are required to be controlled in order to maintain the prescribed BUs are given in Table 3.6.

**Table 3.6: Water Quality Parameters to be Controlled for Specific Marine Related Beneficial Uses**

<b>Parameter</b>	<b>BU-1</b>	<b>BU-2</b>	<b>BU-3</b>	<b>BU-4</b>	<b>BU-5</b>	<b>BU-6</b>	<b>BU-7</b>	<b>BU-8</b>
Aesthetic	n/a	+	+	+	+	+	+	+
Bacterial	n/a	-	-	+	+	+	-	-
DO	n/a	+	+	-	-	+	-	-

**Table 3.6 Cont'd....**

Parameter	BU-1	BU-2	BU-3	BU-4	BU-5	BU-6	BU-7	BU-8
pH	n/a	+	+	+	+	+	-	-
Ammonia	n/a	+	+	-	-	+	-	-
Temperature	n/a	+	+	-	-	-	-	-
Colour	n/a	+	+	+	+	+	-	-
Suspended Solids	n/a	+	+	-	-	+	-	-
Salinity	n/a	+	+	-	-	-	-	-
Dangerous Substances	n/a	+	+	+	+	+	-	-

Notes: n/a - not applicable

### Marine Water Quality Objectives

3.4.9 The WQO for the North Western Waters have been gazetted and have clear objectives which are provided in Table 3.7.

**Table 3.7: Marine Water Quality Objectives for the North Western Waters Water Control Zones**

Water Quality Parameter	Objective	Part of Zone
<i>E.coli</i>	annual mean not to exceed 610 cfu/100 mL	secondary contact recreation sub-zone
Dissolved Oxygen within 2m of the bottom	not less than 2 mg/L for 90% of samples	marine waters
Dissolved Oxygen depth averaged	not less than 4 mg/L for 90% of samples	marine waters except fish culture sub zone
pH value	values to be 6.5-8.5, change due to waste discharge not to exceed 0.2	marine waters except bathing beach subzones
Salinity	change due to waste discharge less than 10% of natural ambient level	whole zone
Temperature Change	change due to human activity not to exceed 2 Centigrade degrees	whole zone

**Table 3.7 Cont'd....**

<b>Water Quality Parameter</b>	<b>Objective</b>	<b>Part of Zone</b>
Suspended Solids	waste discharge not to raise the natural ambient level by 30% nor cause accumulation of suspended solids which may adversely affect aquatic communities	marine waters
Toxic Substances	not to be present at levels producing significant toxic effects	whole zone
Unionised Ammonia	annual mean not to exceed .021mg/L	whole zone
Nutrients	not be present in quantities that cause excessive algal growth	marine waters
	annual mean depth average inorganic nitrogen not to exceed 0.5 mg/L for North Western WCZ	marine waters except Castle Peak subzone

### 3.5 Waste Management

- 3.5.1 Waste management will be assessed in accordance with Annex 7 of the TMEIA which states that all relevant requirements of the Waste Disposal Ordinance should be complied with. The Waste Disposal Ordinance prohibits the unauthorised disposal of wastes, with waste defined as any substance or article which is abandoned. Construction waste is not directly defined in the Ordinance but is considered to fall within the category of "trade waste". Wastes can only be disposed of at a licensed site under this Ordinance.
- 3.5.2 In addition, construction wastes which are wholly inert may be taken to public dumps. The Government Lands Ordinance requires that dumping licences are obtained by individuals or companies who deliver suitable construction wastes to public dumps. Under the licence conditions public dumps will accept only inert building debris, soil, rock and broken concrete.
- 3.5.3 Under the Waste Disposal (Chemical Waste) (General) Regulation, 'chemical waste' includes any scrap material, effluent or unwanted substances which contains any substance specified in Schedule 1 of the regulations. These are noted as posing serious environmental, health, and safety hazards if not stored and disposed of appropriately. Chemical wastes are often produced primarily as a result of construction equipment maintenance activities, and include liquids such as waste oils and cleaning solvents. The Contractor must register as a chemical waste generator with EPD and arrange for a licensed collector to collect and dispose of the waste.

### 3.6 Ecology

#### Environmental Impact Assessment Ordinance

- 3.6.1 The Environmental Impact Assessment Ordinance sets out specific requirements for projects needing ecological assessments and the TMEIA provides criteria for evaluating ecological impact (Annex 8) and guidelines on ecological assessment (Annex 16).

#### **Hong Kong Planning Standards and Guidelines Chapter 10 (Conservation)**

- 3.6.2 The Town Planning Ordinance and the guidance set out in the Hong Kong Planning Standards and Guidelines Chapter 10 (Conservation) as it relates to green belt and areas of landscape interest are applicable to this Project.

#### **Forests and Countryside Ordinance**

- 3.6.3 The Forest and Countryside Ordinance provides for the general protection of vegetation and gives special protection to certain plants. This Ordinance would apply mainly during the construction period of the proposed works.

#### **Wild Animals Protection Ordinance**

- 3.6.4 The Wild Animals Protection Ordinance protects listed species of wild animals. All birds and most mammals including bats are protected under this Ordinance. This Ordinance would apply to the Project mainly during the construction period of the proposed works because of possible disturbance, taking or removal of animals and/or their nests or eggs.
- 3.6.5 It is considered that none of the International Conventions such as the Ramsar and Bonn Conventions will be of particular relevance to this project.

#### **Fisheries Protection Ordinance**

- 3.6.6 The Fisheries Protection Ordinance provides for the protection of spawning and nursery areas for both fish and other marine life. This Ordinance would apply mainly during the construction period of the proposed works.

### **3.7 Heritage**

#### **Environmental Impact Assessment Ordinance**

- 3.7.1 Criteria for the assessment of cultural heritage are presented in Annex 10 of the TMEIA but more specific requirements are set out below.

#### **Antiquities and Monuments Ordinance**

- 3.7.2 Buildings and structures and above ground archaeological sites considered to have historical value may be gazetted and protected under the Antiquities and Monuments Ordinance (Cap 53). Under the Ordinance, the Antiquities Authority (the Secretary for Home Affairs) may, after consultation with the Antiquities Advisory Board (AAB) and with Government approval, declare any place, building, site or structure which the Antiquities Authority considers to be of public interest by reason of its historical, archaeological or paleontological significance, to be

a monument, historical building, archaeological or paleontological site or structure. Once declared to be a site of public interest, no person may undertake acts which are prohibited under the Ordinance, such as to demolish or carry on building or other works, unless a permit is obtained from the Antiquities Authority.

- 3.7.3 The Antiquities and Monuments Office (AMO) of the Home Affairs Bureau is part of the Government Secretariat and comprises the executive arm of the Antiquities Authority. The Antiquities and Monuments Office services the Antiquities Advisory Board who are responsible for advising the Government on sites which merit protection. The office further has responsibility for the protection of buildings and items of historical interest and areas of archaeological significance.

### **Cultural Heritage**

- 3.7.4 The Home Affairs Bureau provide guidelines and Criteria for Cultural Heritage Impact Assessment (CCHIA) which stress that preservation in totality must be taken as the first priority. Projects undertaken are not to cause excessive impact on archaeologically and historically important sites unless there are adequate protection or mitigation measures or a satisfactory rescue plan is proposed.

- 3.7.5 The AMO considers all buildings and structures in the following categories to be historical and deserving of consideration for preservation:

- C all pre-1950 buildings and structures; and
- C selected post-1950 buildings and structures of high architectural and historical significance and interest.

- 3.7.6 Once identified as having the potential for conservation, buildings are entered into the record. They are then graded by AMO to show their relative value. Evaluation is based on the following criteria:

- C outstanding architectural merits - especially features emphasising certain period, technological and artistic merits;
- C special historical interest - accommodating important civic or social function, for example, ancestral halls, religious buildings, post offices, city halls, courts of law, railways station, etc;
- C associations - with important events or well-known persons; and
- C group value - especially in historic villages.

- 3.7.7 Archaeological sites are identified and recorded by the AMO as they are revealed through systematic survey, casual finding and/or the EIA process. All such archaeological sites are considered to be of cultural heritage value and their preservation in totality is taken as the primary aim of the EIA process. The CCHIA stipulate that if this is not possible, amelioration must be achieved by reduction of potential impacts and preservation achieved by means of

detailed cartographic and photographic survey or preservation of an archaeological site 'by record', i.e. through excavation to extract the maximum data as the very last resort. The search for and excavation of all archaeological material requires a license from the Antiquities Authority.

### **3.8 Landscape and Visual**

#### **Environmental Impact Assessment Ordinance**

3.8.1 The preparation of a landscape and visual impact assessment is currently controlled by the Environmental Impact Assessment Ordinance which makes specific reference to issues and concerns to be considered during the assessment of visual and landscape impacts. The criteria for evaluating impacts are presented in Annex 10 of the TMEIA, and the criteria for determining acceptability are set out in Annex 18.

#### **Other Landscape Documents**

3.8.2 Landscape and visual issues pertinent to this study are addressed by the following documents:

- (i) The 1990 Government White Paper on "Pollution in Hong Kong - A Time to Act" offers general policy objectives on avoiding environmental problems by considering all environmental impacts at the early stages of development process; and
- (ii) WBTC 24/94 PELB 3/94 controls tree preservations and minimising tree felling throughout the Territory with General Regulation 740 outlining the process of Government tree felling application approval to provide permission to fell or cut trees.