2. ENVIRONMENTAL LEGISLATION AND STANDARDS

2.1 Introduction

This section of the report discusses the environmental legislation, controls and standards that will apply to the design, construction and operation stages of the project.

2.2 Noise Quality

Noise is controlled through the Noise Control Ordinance (NCO) (Cap. 400), it's regulations and three technical memoranda (TMs), two of which apply to construction noise and the third to non-construction noise. The NCO imposes stringent controls on any construction work that is carried out in close proximity to any Noise Sensitive Receiver (NSR) and the Authority (Director of Environmental Protection) uses a permit system to control construction noise according to the criteria laid down in the TMs.

The Technical Memorandum on Noise from Construction Work other than Percussive Piling (TM1) sets out standards for construction noise and the method of calculating the noise impact. No work using powered mechanical equipment is allowed during restricted periods unless a Construction Noise Permit (CNP) is issued by the Authority. Basic Noise Levels (BNLs) are described for the areas according to their sensitivity rating as shown in Table 2.1.

Table 2.1 Area Sensitivity Rating

Type of Area Containing Noise Sensitive Receiver	Degree to which NSR is affected by Influencing Factors		
	Not Affected	Indirectly Affected	Directly Affected
Rural area, including country parks or village type development	A	B	B
Low density residential area consisting of low rise or isolated high-rise developments	A	B	C

Source : TM1

The Area Sensitivity Rating (ASR) of the Study Area is 'A' as it is a rural area and will not be affected by any Influencing Factors. The BNLs for an ASR of "A" are shown in Table 2.2. The Acceptable Noise Levels (ANLs) for construction are calculated from the BNLs following corrections for the duration of the CNP and for multiple site situations. The ANLs for this project have therefore been assumed to be the same as the BNLs.

Table 2.2 Acceptable Noise Levels for Construction

Time Period	Acceptable Noise Level (dB(A))
Period 1 All days during the evening (1900 - 2300 hours), and general holidays (including Sundays) during the daytime and evening (0700 - 2300 hours)	60
Period 2 All days during the night time (2300 - 0700 hours)	45

Source : TM1

Percussive piling is permitted only within the constraints of a CNP. The Technical Memorandum on Noise from Percussive Piling (TM2) sets out the requirements for working under a CNP and determination of the permitted hours of operation and other conditions where necessary. Percussive piling is prohibited during the restricted periods unless specifically exempted. It is not anticipated that there will be any percussive piling in the vicinity of any sensitive receivers for this project so this is not discussed further.

Noise during operation of the container back up area will be controlled under the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (TM3). The ASR during operation will remain as "A" for planning purposes by recommendation of EPD. ANLs during operation are shown in Table 2.3. During planning HKPSG require -5dB(A) which is the figure quoted in Table 2.3. However once the port commences operation, it will be assessed against category 'B' in the NCO for enforcement.

Table 2.3 Acceptable Noise Levels for Operation

Time Period	Acceptable Noise Level dB(A)
Daytime (0700 to 1900 hours)	60
Evening (1900 to 2300 hours)	60
Night-time (2300 to 0700 hours)	50

Source : TM3

Further subsidiary regulations control the noise from hand held percussive breakers and air compressors and require compliance with the relevant noise emission standards and the fitting of Noise Emission Labels.

2.3 Air Quality

Regulations in force under the 1983 Air Pollution Control Ordinance, Cap. 311, provide for the control of air pollutant emissions from industrial activities and other stationary sources.

Under the legislation the Statement of Air Quality Objectives (AQOs), presented in Table 2.4, provides the statutory AQOs for the Air Control Zones (ACZs) that have been declared for the whole of the territory. The Study Area is located in the Lantau ACZ.

Certain specified processes are named under the APCO and have specific controls attached. Of the construction activities concrete batching and rock crushing are specified processes and the Contractor will require a special permit licence if he needs to operate such plant.

Table 2.4 Hong Kong Air Quality Objectives

Pollutant	Concentration $\mu g/m^3$ (i) Averaging Time				
	1 Hour (i)	8 Hours (iii)	24 Hours (iii)	3 Months (iv)	1 Year (iv)
Sulphur Dioxide	800		350		80
Total Suspended Particulates (v)			260		80
Respirable Suspended Particulates (v)			180		55
Nitrogen Dioxide	300		150		80
Carbon Monoxide	30000	10000			
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

In addition to the above EPD recommend a maximum level of hourly total suspended particulates of 500 $\mu g/m^3$ at the boundary of any construction site.

2.4 Water Quality

Marine water quality, in Hong Kong, is protected under the Water Pollution Control Ordinance (Cap 358) (WPCO). An amendment to the Ordinance subdivided the Territorial waters into Water Control Zones (WCZ) which were each ascribed a series of Water Quality Objectives (WQO) relating to the Beneficial Uses (BU) and assimilative capacity of the particular water body or part thereof.

The Study Area is located within the Southern Water Control Zone (SWCZ), which was declared in 1988. All eight BU's are applicable for this WCZ, and the corresponding WQO's for the SWCZ are set out in Table 2.5.

Table 2.5 Summary of Water Quality Objectives for Southern Waters

Water Quality Parameter	Objective	Sub-zone
Offensive odour, tints and colours	Not to be present	Whole zone
Visible foam, oil grease, scum, litter	Not to be present	Whole zone
E.coli	Not to exceed 610 per 100ml, calculated as the geometric mean of all samples collected in a calendar year	Secondary contact recreation subzones and fish culture zones
	Not to exceed 180 per 100ml, calculated as the geometric mean of all samples collected between March and October inclusive in one calendar year	Bathing beach subzones
D.O. within 2m of bottom	Not less than 2mg/l for 90% samples	Whole zone
Depth average D.O.	Not less than 4mg/l for 90% samples during year	Marine waters except fish culture sub zone
	Not less than 5mg/l for 90% samples	Fish culture sub zone
Depth average D.O.	Waste discharges not to cause less than 4mg/l	Inland waters of the zone
pH	To be in the range 6.5 - 8.5, change due to waste discharge not to exceed 0.2	Marine waters except bathing beach subzones : Mui Wo (A, B, C, D, E, F)
Temperature change	Change due to waste discharge not to exceed 2°C	Whole zone
Salinity	Change due to waste discharge not to exceed 10% of natural ambient level	Whole zone

Table 2.5 Summary of Water Quality Objectives for Southern Waters (Cont'd)

Water Quality Parameter	Objective	Sub-zone
Suspended solids	Waste discharge not to raise the natural ambient level by 30% nor cause the accumulation of suspended solids which may adversely affect the aquatic communities	Marine waters
Ammonia	Annual mean not to exceed 0.021mg/l calculated as the annual average, unionised form	Whole zone
Nutrients	Not to be present in quantities that cause excessive algal growth Annual mean depth average inorganic nitrogen not to exceed 0.1mg/l	Marine waters
BOD5	Waste discharges not to exceed 5mg/l	Inland waters of the zone
COD	Waste discharges not to exceed 30mg/l	Inland waters of the zone
Toxicants producing significant toxic effects	Not to be present at levels producing significant toxic effects	Whole zone

Sources : 1988 Ed. SWCZ Statement of Water Quality Objectives, WPCO Cap. 358 SWCZ statement of Water Quality Objectives (Amendment) Statement 1991, WPCO Chapter 358

In 1990, a Technical Memorandum defining quality standards for the discharge of effluent into any foul sewers, stormwater drains, inland waters and coastal waters within the WCZ's was prepared. In January 1991 the Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters, (TM), was issued.

Under the provisions of the TM all discharges must be licensed. Tables included within the document identify standards attached to effluent flow rates ranging from $< 10m^3$/day to $6,000m^3$/day thus providing guidance on a case by case basis.

A further amendment, referred to as the Water Pollution Control (Amendment) 1993, deals mainly with licensing conditions and penalties.

2.5 Marine Sediments

Marine dumping of dredged marine mud is controlled by license under the Dumping at Sea Act 1974 (overseas Territories) Order 1975. Works Branch Technical Circular No. 22/92 outlines the procedures to be followed in all works, both public and private, which involve the marine disposal of dredged mud.

Marine sediments are classified in the Technical Circular (TC) No. 1-1-92 according to their level of contamination by toxic metals. The classes are defined as follows:

Class A - Uncontaminated material, for which no special dredging, transport or disposal methods are required beyond those which would normally be applied for the purpose of ensuring compliance with EPD's Water Quality Requirements, or for protection of sensitive receptors near the dredging or disposal areas.

Class B - Moderately contaminated material, which requires special care during dredging and transport, and which must be disposed of in a manner which minimises the loss of pollutants either into solution or by resuspension.

Class C - Seriously contaminated material, which must be dredged and transported with great care, which cannot be dumped in the gazetted marine disposal grounds and which must be effectively isolated from the environment upon final disposal.

The contamination limits of dredged sediments delineating these classes are shown in Table 2.6.

Table 2.6 Classification of Dredged Sediments for Marine Disposal

Class	Cd	Cr	Cu	Hg	Ni	Pb	Zn
A	0.0 - 0.9	0 - 49	0 - 54	0.0 - 0.7	0 - 34	0 - 64	0 - 140
B	1.0 - 1.4	50 - 79	55 - 64	0.8 - 0.9	35 - 39	65 - 74	150 - 190
C	> 1.5	> 80	> 65	> 1.0	> 40	> 75	> 200

Note : Test results should be rounded off to two significant figures before comparing with the table, e.g. Cd to the nearest 0.1 mg/kg, Cr to the nearest 1 mg/kg, and Zn to the nearest 10 mg/kg

Source : EPD Technical Circular No. 1-1-92

2.6 Other Relevant Legislation

Oil and fuel spills to coastal waters are controlled separately under the Shipping and Port Control Ordinance (Cap 313) and are the responsibility of the Marine Department. The Oil Pollution (Land Use & Requisition) Ordinance (Cap. 247) is used to regulate the requisition of vessels and equipment and the recovery of associated costs in clearing up a major oil spill.

The Waste Disposal Ordinance (Cap. 354) was enacted in 1980 and provides the statutory framework for the management of all wastes in Hong Kong by requiring the comprehensive planning for collection and disposal of wastes.

The Merchant Shipping (Prevention and Control of Pollution) Ordinance provides for the control of pollution from ships and the Merchant Shipping (Prevention of Oil Pollution) Regulations 1984 implements Marine Pollution (Marpol) control over all pollution through preventative measures.

Marine dumping and reclamation is controlled through separate sets of legislation. Marine dumping of dredged spoil and excavated material unsuitable for land reclamation is controlled by the Dumping at Sea Act 1974 (Overseas Territories) Order 1975 which also prohibits dumping at sea without a licence. Reclamation and use of the foreshore and seabed is controlled by the Foreshore and Seabed (Reclamations) Ordinance (Cap. 127).

Additional relevant legislation includes the Town Planning Ordinance (Cap. 131) 1988 which provides for control over landuse including waste management uses.

The Buildings Ordinance (Cap. 123) allows the Building Authority to require adequate waste treatment facilities in any new building and provides for control over the design of refuse chutes within buildings and oil storage facilities.

Design of fuel storage facilities and clean up of chemical spillages on land are regulated by the Fire Services Department.

2.7 Ecology

Various legislative and regulatory controls are in place for the conservation of species and protection of the environment.

The Forests and Countryside Ordinance (Cap. 96) 1984, the Country Parks Ordinance (Cap. 208) 1976, the Country Park Special Areas Regulations 1989, Wild Animals Protection Ordinance (Cap. 170) 1980. Animals and Plants Protection of Endangered Species (Cap. 187) 1988, and the Antiquities and Monuments Ordinance (Cap. 53) 1986 are particularly pertinent.

The Town Planning Amendment Ordinance 1991 encompasses Sites of Special Scientific Interest (SSS1), coastal protection areas and any other area or use that could protect the environment.

As the Study Area encompasses waterways frequented by small fishing boats, the Fisheries Protection Ordinance 1987 (Cap. 171) is also relevant as it aims to protect fish and on the aquatic life in addition to regulating fishing practices.

2.8 Hong Kong Planning Standards and Guidelines

Chapter Nine of the Hong Kong Planning Standards and Guidelines (HKPSG) provides wide ranging environmental guidelines for incorporation into the planning stages to reflect the requirements of the NCO (1988) Waste Disposal Regulations (1988), the statutory Waste Disposal Plan for Hong Kong (1989), the standards for the air and water control zones and the Air Pollution Control Ordinance. Sensitive receptors for all pollution impacts are also identified in the HKPSG.