the *Marine Parks Ordinance (Cap.476)* are subject to the relevant Ordinances. A number of SSSI are now zoned under the *Town Planning Ordinance* and in these zoned sites there is a presumption against development. The remaining SSSI are not protected. However any development proposals not in line with the Outline Zoning Plans would be subject to planning, engineering and infrastructure considerations.

10.1.9 In addition to the above ordinances, Annexes 8 and 16 of the *Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM)* describe the criteria for evaluating and guidelines for assessing ecological impacts respectively. These will be adopted in this ecological impact assessment.

10.2 Assessment Methodology

10.2.1 *Aquatic Ecology*

10.2.1.1 The environmental impact assessment study carried out under the Feasibility Study for South East Kowloon Development (Agreement CE 69/94) provided a comprehensive review of baseline ecological conditions. Other relevant studies were also reviewed. Field surveys of marine soft bottom benthic fauna were carried out in addition to the literature review.

Literature review

10.2.1.2 While the study area for terrestrial ecology is 500 m from the boundary of the New Development Area, the assessment area for marine ecology is much larger and covers three Water Control Zones, i.e. Victoria Harbour, the Eastern Buffer and the Western Buffer Water Control Zones. This is the same assessment area used for water quality and fisheries impact assessment. A literature review was conducted to determine existing conditions at both the study area and the assessment area, and to identify habitats and species of potential importance that may be affected by the project. Literature review included Government and private sector reports, independent and Government published literature, Agriculture, Fisheries and Conservation Department (AFCD) publications and academic studies.

10.2.1.3 The marine habitats and ecology of Victoria Harbour are relatively poorly studied when compared with studies focusing on marine pollution. Studies covering the marine biology of the SEKD New Development Area or its immediate surroundings include the following:

- *Spatial Distribution of the Infaunal Benthos of Hong Kong* (Shin & Thompson 1982);
- *Sewage Pollution and the Infaunal Benthos of Victoria Harbour, Hong Kong* (Thompson & Shin 1983); and
- *Spatial and temporal changes in the macrobenthic communities inside Victoria Harbour, Hong Kong (*Cai *et al.* 1997*).*

Other studies provide information to the marine biology of Victoria Harbour include:

- *Central Reclamation Phase III Studies, Site Investigation, Design and Conclusion, Environmental Impact Assessment Final Report* (ERM 1997)
- *Green Island Development Study* (TDD, 1998)

Nullah

10.2.1.4 There is no natural stream course or other natural freshwater water body within the new development area of SEKD. Kai Tak Nullah is an artificial drainage channel with no record of flora or fauna in preliminary survey, and thus is not included in the present study.

Intertidal

10.2.1.5 Previous reclamation has resulted in loss of most natural shorelines in the SEKD area. The inter-tidal zone in the area is characterized by artificial seawalls, some vertical and some sloping rubble mound type, including the Kwun Tong Typhoon Shelter, the Kai Tak Approach Channel (KTAC), the Kai Tak International Airport and most of the Kowloon Bay coastline. The only section of shoreline which is not artificial is located at Kowloon Bay near Hoi Sham Park. Based on field observations and previous records from Feasibility Study for Southeast Kowloon Development (Maunsell 1998), the conditions of this coastline were very poor. There was a small section of sandy shore (less than 10 m) exposed during low tide. No fauna was found and the sand was blackened. Plenty of rubbish and debris covered much of the sandy substrate. No further intertidal field survey was conducted for the present study.

10.2.1.6 The next nearest natural shores are found east of the study area in Junk Bay. Inter-tidal habitats at Chiu Keng Wan were surveyed for Western Coast Road in Tseung Kwan O (*Feasibility Study on the Alternative Alignment for the Western Coast Road, TKO, EIA Report, 1998*). These natural shores, however, are located outside the assessment area of the present study. Other natural shores within the assessment area of marine ecology include those on Green Island. The coasts of Green Island were surveyed for Green Island Development Study (TDD 1998).

Soft bottom benthos

10.2.1.7 To survey marine soft bottom benthic fauna, a one-time grab sampling was carried out to establish benthic baseline conditions and to assess the importance of the existing benthic communities within and outside the areas to be dredged and reclaimed. Grab sampling stations were established both in areas likely to be dredged and reclaimed, and in areas outside the reclamation area. Grab samples were collected on 23 July 2000. Six stations were selected, including four inside the reclamation area and two outside. Stations A and B were located inside the proposed reclamation area of Kowloon Bay, while Station C was just outside the breakwater of To Kwa Wan Sheltered Anchorage. Stations D and E were located inside the existing Kwun Tong Typhoon Shelter, and Station F was located within the KTAC. At each station, three replicates of grab samples of the seabed substrate over a 0.1 m^2 area were collected using a van Veen grab. The sampling locations were identified using a Magellan Nav5000 satellite position system and are shown in **Drawing No. 22936/EN/042**. The samples were washed and sieved with a 0.5 mm sieve and the retained material was preserved with 5% formalin with Rose Bengal. Biota was sorted, counted and identified to the lowest practicable taxon using a stereo binocular microscope. Total weight of organisms in each sample was recorded. Species composition and numerical abundance were tabulated.

10.2.1.8 Species diversity H' and evenness J were calculated for pooled data from each set of three replicates, using the formulae:

$H' = -\sum (Ni / N) \ln (Ni / N)$ (Shannon and Weaver 1963); and

$J = H' / \ln S$ (Pielou 1966),

where S is the total number of species in the sample, N is the total number of individuals, and Ni is the number of individuals of the i^{th} species. Species diversity and evenness were calculated and compared among the stations.

10.2.2 *Terrestrial Ecology*

10.2.2.1 The study area for terrestrial is defined as area within 500m from SEKD New Development Area. Based on results of literature review and preliminary rapid assessment, field surveys were designed to fill in the data gaps and update the terrestrial ecological baseline to provide an adequate basis for assessment.

Habitat mapping

10.2.2.2 Habitats were mapped and updated using 1999 government aerial photos. **Drawing No. 22936/EN/002** shows the habitat map for the study area of South East Kowloon Development (SEKD). Urban habitat classification follows the earlier study (Maunsell 1998). Due to the highly disturbed nature and low ecological value of the vegetation recorded on site, general vegetation surveys were not performed. Findings from literature review are sufficient to describe the flora of the study area. However, field surveys were performed on 13 April, 2000 to search for individuals of a previously recorded orchid species, *Eulophia sinensis*, which flowers in April, on grass habitats along the runway. Sampling points followed those for avifauna point counts (**Drawing No. 22936/EN/042**), with 2 points at the NAKTA area and 3 points along the runway. Orchid surveys covered an area of 20m radius at each of the 5 points. A total area of 6280 m^2 was sampled.

Avifauna

10.2.2.3 Five bird count points were laid out at locations where access was permitted (**Drawing No. 22936/EN/042**). Two points were located on the NAKTA area and three points on the runway. Sampling was carried out at all points on 23, 24, 25 February, 20, 22, 23 March, and 11, 12, 13 April 2000. Sampling started within 30 minutes of sunrise and continued until 1000 hrs on each sampling day. Ten minutes were spent counting birds at each point. All birds heard or seen within 50m from the points were counted and identified to species. Birds observed between points were recorded separately. Ornithological nomenclature in this report follows Viney *et al*. (1994).

10.2.2.4 Within the proposed reclamation area, it was observed that artificial coastlines and coastal roosts (e.g., breakwater) in the Kai Tak Approach Channel and Kwun Tong Typhoon Shelter were roosting sites for birds. Total number of birds seen at these areas were counted by species and recorded (**Drawing No. 22936/EN/042**) separately on each survey date. Surveys were performed on 23, 24, 25 February, 20, 22, 23 March, and 11, 12, 13 April 2000.

Other fauna

10.2.2.5 All non-avian fauna with potential conservation significance (e.g. mammals, reptiles and amphibians, butterflies and dragonflies) recorded incidental to bird sampling were counted and identified to species.

10.3 Description of the Environment

10.3.1 *Aquatic Ecology*

Nullahs

10.3.1.1 Kai Tak Nullah collects storm water from San Po Kong, Diamond Hill, Tsz Wan Shan, Wong Tai Sin, Wang Tau Hom, Lok Fu and Kowloon City and discharges into the Kai Tak Approach Channel. Since the completion of the Tolo Harbour Effluent Export Scheme in 1995, this nullah has also been receiving treated effluent from Sha Tin and Tai Po. In 1998, five out of the six monitoring stations established by EPD for the water quality in the nullah recorded the Water Quality Index (WQI) as “bad”. Only the sixth station which is the most upstream among all the stations recorded “fair” WQI. During the field surveys for the present study, no flora and fauna were recorded in the section of nullah within the study area. Recently, a population of Tilapia was reported in the upper part of the nullah, outside the boundary of the study area (article in "The Sun" dated 17/11/2000). Tilapia, however, was a high pollutant tolerant