
Environmental Impact Assessment Ordinance (Cap. 499), Section 5(7)

Environmental Impact Assessment Study Brief No. ESB - 055/2000

**Project Title: Proposed Development at Fung Lok Wai, Yuen Long at
Lot 1457 R.P. in D.D. 123 (hereafter known as the Project)**

**Name of Applicant: Mutual Luck Investment Limited (hereinafter known as the
“Applicant”)**

1. BACKGROUND

- 1.1 An application (No. ESB-055/2000) for an Environmental Impact Assessment (EIA) study brief under section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO) was submitted by the captioned Applicant on 26.5.2000 with a project profile (No. PP-091/2000).
- 1.2 The Applicant proposes to develop 9 residential towers and 12 terrace houses and a Wetland Nature Reserve (WNR) at the existing fishponds at Fung Lok Wai. The total area of the development is about 80 ha in size including approximately 4.1 ha of residential area, 71.6 ha of WNR and 4.3 ha of bunds and minor roads. The 4.1 ha of residential land will be formed by filling the fishponds at the southern part of the site. The WNR is located at northern part of the site and will form the basis of the ecological compensation for the Project. The site is to the east of Tin Shui Wai Wetland Park to be constructed at the northern part of Tin Shui Wai Reserve Zone and the southwestern part of Mai Po area. The location plan of the project showing the approximate project boundary is given as Figure 1.
- 1.3 The proposed residential development and the Wetland Nature Reserve will include the following elements :
 - (i) 4.1 ha of residential land for 9 residential towers of 12-23 storeys, 12 terrace houses of 4 storeys and a club house;
 - (ii) 71.6 ha of enhanced and managed Wetland Nature Reserve; and
 - (iii) bund for the fishponds and minor roads, including the local access road to the site.
- 1.4 The Project is a Designated Project according to Item P of Part I, Schedule 2 of the EIA Ordinance, since it is a residential development other than New Territories exempted house within the Deep Bay Buffer Zone 1 and 2.
- 1.5 Pursuant to section 5(7)(a) of the EIAO, the Director of Environmental Protection (the Director) issues this EIA study brief to the Applicant to carry out an EIA study.
- 1.6 The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the proposed designated projects and related activities taking place concurrently. This information will contribute to decisions by the Director on:

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- (i) the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the proposed project;
 - (ii) the conditions and requirements for the detailed design, construction and operation of the proposed project to mitigate against adverse environmental consequences wherever practicable; and
 - (iii) the acceptability of residual impacts after the proposed mitigation measures are implemented.

2. OBJECTIVES OF THE EIA STUDY

2.1 The objectives of the EIA study are as follows:

- (i) to describe the proposed project and associated works together with the requirements for carrying out the proposed project;
- (ii) to identify and describe the elements of the community and environment likely to be affected by the proposed project and/or likely to cause adverse impacts to the proposed project, including both the natural and man-made environment;
- (iii) to identify and quantify all environmental sensitive receivers, emission sources and determine the significance of impacts on sensitive receivers and potential affected uses;
- (iv) to identify and quantify any potential losses or damage to flora, fauna and wildlife habitats;
- (v) to identify any negative impacts on sites of cultural heritage and to propose measures to mitigate these impacts;
- (vi) to identify and quantify any potential landscape and visual impacts and to propose measures to mitigate these impacts;
- (vii) to propose the provision of infrastructure or mitigation measures so as to minimize pollution, environmental disturbance and nuisance during construction and operation of the project;
- (viii) to identify, predict and evaluate the residual (i.e. after practicable mitigation) environmental impacts and the cumulative effects expected to arise during the construction and operation phases of the project in relation to the sensitive receivers and potential affected uses;
- (ix) to identify, assess and specify methods, measures and standards, to be included in the detailed design, construction and operation of the project which are necessary to mitigate these environmental impacts and reducing them to acceptable levels;
- (x) to investigate the extent of side-effects of proposed mitigation measures that may lead to other forms of impacts;
- (xi) to identify constraints associated with the mitigation measures recommended in the EIA study;
- (xii) to identify, within the study area, any individual project(s) that fall under

Schedule 2 and/or Schedule 3 of the EIA Ordinance; to ascertain whether the findings of this EIA study have adequately addressed the environmental impacts of those projects; and where necessary, to identify the outstanding issues that need to be addressed in any further detailed EIA study; and

- (xiii) to design and specify the environmental monitoring and audit requirements, if required, to ensure the implementation and the effectiveness of the environmental protection and pollution control measures adopted.

3. DETAILED REQUIREMENTS OF THE EIA STUDY

- 3.1 The purpose of this study brief is to scope the key issues of the EIA study. The Applicant has to demonstrate in the EIA report that the criteria in the relevant sections of the Technical Memorandum on the Environmental Impact Assessment Process of the Environmental Impact Assessment Ordinance (hereinafter referred to as the TM) are fully complied with.

The Scope

- 3.2 The scope of this EIA study shall cover the proposed project and associated works mentioned in section 1.2 and 1.3 above. The EIA study shall cover the combined impacts of all the proposed developments and the cumulative impacts of the existing, committed and planned developments in the vicinity of the proposed project including the proposed Tin Shui Wai Wetland Park, Ramsar Site etc., in accordance with the requirements laid down in section 3.4 of the TM. The environmental impacts of on-site and off-site works and facilities associated with the proposed developments shall be addressed. The EIA study shall address the likely key issues described below, together with any issues identified during the course of the EIA study:
 - (i) noise impacts arising from construction and operation of the development to the nearby village areas;
 - (ii) dust impacts arising from construction of the development to the nearby villages;
 - (iii) landscape and visual impacts during construction and operation of the development;
 - (iv) water quality impacts during construction and operation, including pond draining and filling, sewage collection, treatment and disposal systems, surface runoff and land drainage and stormwater system;
 - (v) potential impacts on historical buildings/architectures and monuments;
 - (vi) wetland loss and impacts to the adjacent fishponds, Tin Shui Wai Wetland Park, Recognized Sites of Conservation Importance including Wetland Conservation Area, Wetland Buffer Area and Ramsar Site due to the construction and operation of the proposed development;

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- (vii) terrestrial and aquatic ecological impacts to the adjacent area with conservation importance and ecologically sensitive areas including proposed Tin Shui Wai Wetland Park, Ramsar site with particular attention to possible fragmentation of the wetland, ecological link between Deep Bay area and the project area, the future buildings on the site to the bird's flight line with special attention to the ambient light at nighttime and the little woodland to the north of Fung Lok Wai;
 - (viii) fisheries impacts during construction and operation of the development;
 - (ix) collection and disposal of potentially contaminated dredged spoil arising from the project; and
 - (x) proposals for the short term and long term management of the proposed Wetland Nature Reserve with the project area including trust and financial arrangement.

Technical Requirements

3.3 The Applicant shall conduct the EIA study to address all environmental aspects of the works and activities as described in the scope set out above.

3.4 The EIA study shall take into consideration and compare clearly and objectively the environmental impacts of different development options considered in the study. In formulating the preferred development option, the Applicant shall seek to avoid adverse environmental effects to the maximum practice extent. It is important to describe adequately in the report the part environmental factors played in the selection of the preferred option(s).

3.5 The EIA study shall include the following technical requirements on specific impacts.

3.5.1 Air Quality Impact

3.5.1.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing air quality impact as stated in Annexes 4 and 12 of the TM, respectively.

3.8.1.2 3.5.1.2 The "Assessment Area" for air quality impact shall be normally defined by a distance of 500m from the boundary of the proposed development (including the access road) as shown in Figure 1, yet it may be extended depending on the circumstances.

3.5.1.3 The construction dust impact assessment shall include the following:

- (i) analysis of construction activities and their characteristics;
- (ii) presentation of background air quality in the study area for the purpose of evaluating the cumulative air quality impacts of the construction activities;
- (iii) identification and description of representative existing air sensitive receivers (ASRs) and planned/committed air sensitive uses that would likely be affected by the air emissions of the construction activities;

- (iv) identification of emission characteristics and provision of emission inventory of the air pollution sources;
- (v) description of the assessment method and the associated assumptions, validity of the method and limits of application. The methodology used shall be agreed with the Director before commencement of study;
- (vi) assessment and evaluation of the net and cumulative air quality impacts of the air emissions at the identified ASRs;
- (vii) presentation of the predicted residual air quality impacts (both unmitigated and mitigated) in the form of summary tables and pollution contours, for comparison with relevant air quality standards and the examination of the land use implications of these impacts;
- (viii) proposals of appropriate mitigation measures to reduce the cumulative air pollution impacts to established standards; and
- (ix) submission of all input and output file(s) of the model run(s) electronic format to the EPD.

3.5.1.4 The Applicant shall note the requirements of the Air Pollution Control (Construction Dust) Regulation in dust control and shall initiate an audit and monitoring program during construction stage to ensure construction dust impacts are controlled within the relevant standards as stipulated in Annex 4 of the TM.

3.5.2 Noise Impacts

3.5.2.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing noise impact as stated in Annexes 5 and 13 of the TM respectively.

3.5.2.2 The noise impact assessment shall include the following:

(i) Determination of Assessment Area

The "Assessment Area" for the noise impact assessment shall include all areas within 300m from the boundary of the proposed development (including the access road) as shown in Figure 1. Subject to the agreement of the Director, the assessment area could be reduced accordingly if the first layer of noise sensitive receivers, closer than 300m from the boundary of the proposed development (including the access road) as shown in Figure 1, provides acoustic shielding to those receivers at further distance behind. Subject to the agreement of the Director, the area shall be expanded to include NSRs at larger distance, which would be affected by the construction and operation of the proposed project.

(ii) Provision of Background Information and Existing Noise Levels

The Applicant shall provide all background information relevant to the project, e.g. relevant previous or current studies.

(iii) Identification of Noise Sensitive Receivers

- (a) The Applicant shall refer to Annex 13 of the TM when identifying the noise sensitive receivers (NSRs). The NSRs shall include all existing

NSRs and all planned/committed noise sensitive developments and uses earmarked on the relevant Outline Zoning Plans (OZP), Outline Development Plans and Layout Plans.

- (b) The Applicant shall select assessment points to represent all identified NSRs for carrying out quantitative noise assessment described below. The assessment points shall be agreed with the Director prior to the quantitative noise assessment. A map showing the location and description such as name of building, use, and floors of each and every selected assessment point shall be given. For planned noise sensitive land uses without committed site layouts, the Applicant should use the relevant planning parameters to work out site layouts for operational noise assessment purpose.

(iv) Provision of an Emission Inventory of the Noise Sources

The Applicant shall provide an inventory of all noise sources during construction and operation of the proposed development. Confirmation of the validity of the inventory shall be obtained from the relevant government departments/ authorities.

(v) Construction Noise Assessment

- (a) The Applicant shall carry out assessment of noise impact from all construction (excluding percussive piling) works of all the concurrent projects in the area during day time, i.e. 7 a.m. to 7 p.m., on weekdays other than general holidays in accordance with the methodology stipulated in paragraphs 5.3. and 5.4 of Annex 13 of the TM. The criteria in Table 1B of Annex 5 of the TM shall be adopted in the assessment.
- (b) To minimise the construction noise impact, alternative construction methods to replace percussive piling shall be proposed as far as practicable.
- (c) If the unmitigated construction noise levels are found exceeding the relevant criteria, the Applicant shall propose practicable direct mitigation measures (including movable barriers, enclosures, quieter alternative methods, re-scheduling and restricting hours of operation of noisy task) to minimise the impact. If the mitigated noise levels still exceed the relevant criteria, the duration of the noise exceedance shall be given.
- (d) In case the Applicant would like to evaluate whether construction works in restricted hours as defined under the Noise Control Ordinance (NCO) are feasible or not in the context of programming construction works, reference should be made to the relevant technical memoranda issued under the NCO. Regardless of the results of the construction noise impact assessment for restricted hours, the Noise Control Authority will process the Construction Noise Permit (CNP)

application, if necessary, based on the NCO, the relevant technical memoranda issued under the NCO, and the contemporary conditions/situations. This aspect should be explicitly stated in the noise chapter and the conclusions and recommendations chapter in the EIA report.

(vi) Operational Noise Assessment

(a) Fixed Noise Sources

- (a1) The Applicant shall identify any fixed noise sources within the "Assessment Area", including all activities within the residential development, any sewage collection, sewage treatment plant, pumping stations, any pump houses, electricity sub-station etc. The Applicant shall calculate the expected noise using standard acoustics principles. Calculations for the expected noise shall be based on assumed plant inventories and utilization schedule for the worst case scenario. The Applicant shall calculate the noise levels taking into account of correction of tonality, impulsiveness and intermittence in accordance with the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites.
- (a2) The Applicant shall present the noise levels in Leq(30min) or other unit(s) as agreed by the Director, at the NSRs at various representative floor levels (in m P.D.) on tables and plans of suitable scale.
- (a3) A quantitative assessment at the NSRs for the fixed noise source(s) shall be carried out and compared against the criteria set out in Table 1A of Annex 5 of the TM.
- (a4) The Applicant shall propose direct mitigation measures within the project limits in all situations where the predicted noise level exceeds the criteria set out in Table 1A of Annex 5 of the TM to protect the affected NSRs.

(vii) Assessment of Side Effects and Constraints

The Applicant shall identify, assess and propose means to minimize any side effects and to resolve any potential constraints due to the inclusion of any recommended direct technical remedies.

(viii) Evaluation of Constraints on Planned Noise Sensitive Developments/Land Uses

For planned noise sensitive uses which will still be affected even with all practicable direct technical remedies in place, the Applicant shall propose, evaluate and confirm the practicality of additional measures within the planned noise sensitive uses and shall make recommendations on how these noise sensitive uses will be designed for the information of relevant parties.

The Applicant shall take into account agreed environmental requirements / constraints identified by the study to assess the development potential of concerned sites which shall be made known to the relevant parties.

3.5.3 Water Quality Impact

3.5.3.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing water quality impact during the construction and operation phases as stated in Annexes 6 and 14 of the TM respectively.

3.5.3.2 The Applicant shall conduct the following detailed water quality assessment.

Water Quality Impact Assessment

3.5.3.3 The “Assessment Area” for the purpose of water quality impact assessment shall cover all relevant sensitive receivers in Fung Lok Wai and the surrounding areas, in particular the fishponds surrounding the study area and in the larger Deep Bay Catchment Area of the Deep Bay Water Control Zone (WCZ), the Ramsar Site, and Tin Shui Wai Wetland Park.

3.5.3.4 The Applicant shall identify and analyze all physical, chemical and biological disruptions of water system(s) arising during the construction and operation of the project (including the impacts arising from emergency discharge from sewage pumping stations and sewer bursting discharge). The Applicant shall address the following:

General

- (i) collection and review of background information on the existing water system(s) and the respective catchment(s);
- (ii) characterization of water and sediment quality of the natural/artificial water courses and manmade fishponds based on existing information or site surveys/ tests as appropriate;
- (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 including inshore water protection/recreation areas, in particular the fishponds surrounding the study area, the Ramsar Site, and Tin Shui Wai Wetland Park;
- (iv) identification of pertinent water quality objectives and establishment of other appropriate water quality and sediment criteria or standards for the water system(s) and all sensitive receivers affected by the project;
- (v) identification of any alteration of natural/artificial water course, manmade fishponds, wetlands, change of water courses/drainage channel, natural stream/ponds, wetland, change of water holding/flow regimes; change of ground water levels, change of catchment types or areas;

- (vi) identification, analysis and quantification of all existing and likely future water and sediment pollution sources, including point discharges and non-point sources to surface water runoff, storm water and pond water discharges. Field investigation and laboratory tests shall be conducted as appropriate;
- (vii) establishment and provision of an emission inventory on the quantities and characteristics of all these pollution sources;

Impact Predictions

- (viii) prediction and quantification by mathematical modelling or other technique approved by the Director, of the impacts on the water system(s) and the sensitive receivers due to those alterations and changes identified in (v) and the pollution sources identified in (vi) above. Possible impacts include changes in hydrology, flow regime, sediment erosion or deposition, water and sediment quality and the effects on the aquatic organism due to such changes. The prediction shall take into account and include likely different construction stages or sequences, different operation stages. Cumulative impacts due to other projects, activities or pollution sources within a boundary around the Study Area to be agreed by the Director shall also be predicted and quantified;
- (ix) assessment and evaluation of water quality impacts on the sensitive receivers due to the operation of the proposed residential development and the WNR. Among other receivers, the impact on the operation of the wetland habitats on or near the northern part of Fung Lok Wai, the Ramsar Site, Tin Shui Wai Wetland Park and the Deep Bay Wetland Conservation Area/Buffer Area shall be included.

Waste Water Pollution

- (x) analysis on the adequacy of existing and planned future sewerage infrastructure to receive point discharges of waste water identified in (vi) above;
- (xi) analysis on the provision and adequacy of existing and planned future facilities to reduce pollution arising from the non-point sources identified in (vi) above;
- (xii) identification and quantification of the residual pollution load from the proposed treatment facilities for treating all point/non-point sources of waste water;
- (xiii) identification of the alignment, volume and possible pollutants contained in pond water and storm water discharges;
- (xiv) analysis on the characteristics of sewage nature;
- (xv) identification and quantification of the pond water, stormwater, proposed interim treated effluent discharge and other point/non-point sources pollution loads to the wetlands in the study site, the Ramsar Site, and Tin Shui Wai Wetland Park and the other surrounding water courses/bodies;

- (xvi) evaluation and quantification of residual impacts on the water system(s) and the sensitive receivers with regard to the appropriate water and sediment quality criteria, standards and guidelines; and
- (xvii) analysis and assessment of the impacts due to additional sewage discharge from the project to the existing/planning sewerage system and sewage treatment works in North West New territories ;
- (xviii) assessment on the impacts of using ozone or chlorine as disinfectants in the proposed development, in particular on the potential of generation of carcinogenic and toxic organic chlorides; and
- (xix) identification and assessment of the residual impacts of any fertilizer, pesticides and/or herbicides (if applied) on the drainage channel, groundwater, or other inland water courses/bodies.

Dredging and Pond Draining and Filling

- (xx) identification and quantification of all dredging, pond draining and filling, site leveling, sediment/ mud transportation and disposal activities and requirements. Potential fill source, if required and dumping ground to be involved shall also be identified. Field investigation, sampling and laboratory tests to characterize the pond water quality and sediment/mud concerned shall be conducted as appropriate. The ranges of parameters to be analyzed; the number, type and methods of sampling/sampling preservation/ laboratory tests; and the laboratory to be used shall be approved by the Director. Particular attention shall be given to the requirement of WBTC No. 3/2000 on "Management of Dredged/Excavated Sediment";
- (xxi) prediction, quantification and assessment of impacts on the physical regime, water and sediment quality of the water systems(s) and the nearby sensitive receivers due to the activities identified in section (xx) above. The prediction and quantification of impacts caused by sediment re-suspension and contaminants release shall be carried out by mathematical modelling or other techniques approved by the Director;
- (xxii) identification and evaluation of the best practicable dredging and pond filling methods to minimize dredging and dumping requirements and demand for fill sources based on the criterion that existing pond mud/stream sediment shall be left in place and not be disturbed as far as possible;
- (xxiii) evaluation of the impacts due to release of the interstitial water and associated contaminants to the water column, if wick drain installation is employed to speed up consolidation of mud;
- (xxiv) prediction and quantification of cumulative impacts due to other dredging, filling or dumping activities within a boundary around the study area to be agreed by the Director; and
- (xxv) among other sensitive receivers, impact on the habitats and ecological

mitigation measures of the nearby Ramsar Site, Wetland Conservation Area/Wetland Buffer Area, Tin Shui Wai Wetland Park and the fishponds surrounding the study area shall be addressed.

Potential Problem of Biogas on Reclamation (Pond Filling)

- (xxvi) Investigation of the potential biogas problem arising from leaving pond mud in place, including:
- (a) a proposal on collection and analysis of representative samples in various depths for the agreement of the Director;
 - (b) carrying out the actual sampling and testing as agreed by the Director; and
 - (c) a proposal, with justifications, on monitoring, mitigation and precautionary measures on proposed developments, if found necessary.

Mitigation

- (xxvii) proposal of effective infrastructure upgrading or provision, water pollution prevention and mitigation measures to be implemented during the construction, operation stages so as to reduce the water and sediment quality impacts to within acceptable levels of standards. Best management practices to reduce pond water, storm water, pesticides and herbicides and non-point source pollution shall be investigated and proposed as appropriate;
- (xxviii) formulate the mitigation measures to offset the residual pollution load identified in section (xii) above in order to achieve the requirement of no net increase of pollution load to Deep Bay from the proposed development; and
- (xxix) provide adequate monitoring programme to assess the effectiveness of the proposed offsetting measures identified in section (xxviii).

3.5.4 Sewerage and Sewage Treatment Implications

- 3.5.4.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing impacts on the downstream public sewerage, sewage treatment and disposal facilities as stated in section 6.5 in Annex 14 of the TM.
- 3.5.4.2 The Applicant shall investigate and determine the need and the feasibility of having central pre-treatment facilities and/or a separate sewage treatment plant within the study area.
- 3.5.4.3 The Applicant shall study and assess the possibility of discharging sewage discharge to the existing/planning sewerage systems in North West New Territories. The assessment shall include the following:
- (i) investigate and review the adequacy of the existing/planned sewerage and treatment facilities for absorbing part or all of the sewage discharge from the

proposed development within the scope of EIA study as defined in section 3.2 above. The Applicant shall confirm in the EIA report that whether the existing/planning sewerage systems and sewage treatment works in North West New Territories will provide adequate capacity for the proposed development. The appropriate treatment level of interim discharge, if required, shall be assessed;

- (ii) any additional sewage flows and flow projections from other existing/planned developments to be connected to the existing/planning sewerage systems and sewage treatment works in North West New Territories shall be assessed. The water quality impacts arising from the interim and ultimate effluent discharge, if any, shall be assessed in accordance with section 3.5.3 above.
- (iii) based on the above items (i) and (ii), if the existing/planned sewerage layout or capacities cannot cope with the maximum discharges, the Applicant shall propose an optimal and cost-effective upgrading works to improve the existing/planned sewerage and sewage treatment facilities or to provide new sewerage and sewage treatment facilities to receive and transport the sewage arising during the construction and operation of the proposed development. Any proposed sewerage system should be designed to meet current DSD standards. Computerised analysis techniques such as HYDRO WORKS may be used in the preliminary design.
- (iv) identify and quantify the water quality and ecological impacts due to the emergency discharge from sewage pumping stations and sewer bursting discharge, and to propose measures to mitigate these impacts;
- (v) identify the appropriate alignment of the sewerage to connect to the existing sewerage system in North West New Territories; investigate and assess the technical feasibility of connection (e.g. technical details for direct connection to sewage treatment works);
- (vi) set out the design, operation and maintenance requirements for any proposed sewerage and sewage treatment facilities, such as pumping station(s) and central pre-treatment facilities for food catering effluent (if recommended), including electrical and mechanical components to eliminate the problem of septicity incurred in long rising main(s) during low flows and to facilitate maintenance. The design, operation and maintenance requirements for the proposed sewage treatment facilities shall be agreed by DSD and EPD. (Twin rising mains for each pumping station should be provided to make sure that the proposed sewage rising mains are maintainable without shutting down and discharging untreated sewage into the natural stream/drainage channel directly).

3.5.5 Waste Management Implications

3.5.5.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing waste management implications as stated in Annexes 7 and 15 of the TM, respectively.

3.5.5.2 The assessment of waste management implications shall cover the following:

(i) Analysis of Activities and Waste Generation

The Applicant shall identify the quantity, quality and timing of the waste arising as a result of the construction and operational activities, based on the sequence and duration of these activities.

(ii) Proposal for Waste Management

(a) Prior to considering the disposal options for various types of wastes, opportunities for reducing waste generation and on-site or off-site re-use shall be fully evaluated. Measures which can be taken in the planning and design stages e.g. by modifying the design approach and in the construction stage for maximising waste reduction shall be separately considered.

(b) Having taken into account all the opportunities for reducing waste generation and maximising reuse, the types and quantities of the wastes required to be disposed of as a consequence including potentially contaminated materials shall be estimated and the disposal options for each type of waste described in detail. The disposal method recommended for each type of wastes shall take into account the result of the assessment in (c) below.

(c) The impact caused by handling (including labelling, packaging & storage), collection, and disposal of wastes shall be addressed in detail and appropriate mitigation measures proposed including the prevention of flytipping during construction. This assessment shall cover but not limited to the following areas :

- potential hazard;
- air and odour emission;
- noise;
- wastewater discharge; and
- public transport.

3.5.6 Ecological Impact (Terrestrial and Aquatic)

3.5.6.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing ecological impact as stated in Annexes 8 and 16 of the TM respectively during the construction and operational phases. The assessment shall include the ecological survey of the "Assessment Area" as defined in section 3.5.6.2 below

3.5.6.2 The "Assessment Area" for the purpose of terrestrial ecological assessment shall include all areas within 500m distance from the boundary of the proposed development (including the access road) as shown in Figure 1, or the area likely to be impacted by the proposed developments. The "Assessment Area" for the purpose of marine ecological assessment shall be the same as the "Assessment

Area” for water quality impact assessment.

- 3.5.6.3 In the ecological impact assessment, the Applicant shall examine the flora, fauna and other components of the ecological habitats within the “Assessment Area”. The aim shall be to protect, maintain or rehabilitate the natural environment. In particular, the proposed project shall avoid impacts on recognized sites of conservation importance and other ecological sensitive areas. The assessment shall identify and quantify as far as possible the potential ecological impacts associated with the proposed development.
- 3.5.6.4 The assessment shall include the following major tasks:
- (i) review and incorporate the findings of relevant studies including the Tin Shui Wai Development Engineering Investigations for Development of Area 3,30 & 31 of the Development Zone and the Reserve Zone and collate all the available information regarding the ecological characters of the “Assessment Area”;
 - (ii) identify any information gap relating to the assessment of potential ecological impacts to the terrestrial and aquatic environment;
 - (iii) carry out any necessary field surveys, the duration of which shall be at least 12 months and cover the winter migratory bird season, and investigations to fill in the information gap, if any, and to fulfil the objectives of the EIA study;
 - (iv) establish the general ecological profile and describe the characteristics of each habitat found within the study boundary, committed ecological measures including those under the EIA Ordinance or the Town Planning Ordinance (such as reinstatement of fishponds) should be taken into consideration; major information to be provided shall include:
 - (a) description of the physical environment;
 - (b) habitat maps of suitable scale (1:1000 to 1:5000) showing the types and locations of habitats in the “Assessment Area”;
 - (c) ecological characteristics of each habitat type such as size, vegetation type, species present, dominant species found, species diversity and abundance, community structure, inter-dependence of the habitats and species, and presence of any features of ecological importance;
 - (d) representative colour photographs of each habitat type and any important ecological features identified;
 - (e) species found that are rare, endangered and/or listed under local legislation, international conventions for conservation of wildlife/habitats or red data books;
 - (v) investigate and describe the existing wildlife uses of various habitats with special attention to:

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- (a) wetlands including fish ponds, wet agricultural land, marsh;
 - (b) avifauna;
 - (c) fung shui woodland;
 - (d) natural stream courses and man made drainage channels; and
 - (e) any other habitats and wildlife groups identified as having special conservation interests by this study.
 - (vi) describe all recognized sites of conservation importance in the proposed development site and its vicinity in particular the Deep Bay Wetland Conservation Area, Wetland Buffer Area, Ramsar Site and Tin Shui Wai Wetland Park and assess whether these sites will be affected by the proposed developments or not;
 - (vii) investigate the impact of the high rise residential buildings in the project area on the bird's flight path taking into account of diurnal and seasonal patterns;
 - (viii) using suitable methodology, identify and quantify as far as possible any direct, indirect, on-site, primary, secondary and cumulative ecological impacts such as destruction of habitats, reduction of species abundance/diversity, loss of feeding grounds, reduction of ecological carrying capacity, loss in ecological linkage and function, habitat fragmentation and other possible disturbances caused by the development of the project and the activities of the residents;
 - (ix) evaluate the significance and acceptability of the ecological impacts identified using well-defined criteria;
 - (x) recommend all possible alternatives (such as modifications of layout and design) and practicable mitigation measures to avoid, minimize and/or compensate for the adverse ecological impacts identified;
 - (xi) evaluate the feasibility and effectiveness of the recommended mitigation measures and define the scope, type, location, implementation arrangement, subsequent management, resources requirement and maintenance of such measures;
 - (xii) determine and quantify as far as possible the residual ecological impacts after implementation of the proposed mitigation measures;
 - (xiii) evaluate the severity and acceptability of the residual ecological impacts using well-defined criteria. If off-site mitigation measures are considered necessary to mitigate the residual impacts, the guidelines and requirements laid down in the TM shall be followed;
 - (xiv) review the need for and recommend any ecological monitoring programme required; and
 - (xv) propose a management package for the 71.6 ha Wetland Nature Reserve in the project area with particular attention to :
 - (a) the habitat management plan and specification of resources

- requirement for its implementation;
- (b) the long-term trust management system with management guidelines;
- (c) the financial arrangement to sustain the management of the wetland;
- (d) the management agents and their responsibility; and
- (e) a contingency plan for the management of the WNR before the well establishment of trust management.

3.5.7 Fisheries Impacts

3.5.7.1 Fisheries Impact Assessment shall follow the criteria and guidelines as specified in Annexes 9 and 17 of the TM respectively. The “Assessment Area” for the purpose of the fisheries impact assessment shall include the area within the boundary of the proposed development (including the access road) as shown in Figure 1, and its adjacent area of potential impact. The assessment shall review and collate existing information to provide adequate and accurate data for prediction and evaluation of impacts of the proposed developments on fisheries. The assessment shall include the following:

- (i) description of the physical environmental background;
- (ii) description and quantification as far as possible of the existing aquaculture activities, with special attention on fishponds in Fung Lok Wai and around Mai Po;
- (iii) description and quantification as far as possible of the existing fisheries/aquaculture resources;
- (iv) identification of parameters (eg. water quality parameters) and area that are important to aquaculture activities;
- (v) identification and quantification as far as possible of any direct/indirect and on-site/off-site impacts to aquaculture, including permanent loss and temporary occupation of fishponds and those impacts on aquaculture activities due to sewer bursting and emergency discharge from sewage pumping stations;
- (vi) (vi) evaluation of impacts on aquaculture activities during construction and operation stages in areas around Fung Lok Wai and Mai Po and other affected areas;
- (vii) evaluation of cumulative impacts of loss of fishponds in the North West New Territories.

Fisheries Mitigation / Compensation Measures

- (viii) identify practical mitigation measures to avoid/minimize the potential impacts on the aqua-culture activities;
- (ix) identify and present an adequate package of measures fully compensate all the losses due to the project with details on justification, description of scope and programme feasibility as well as staff and financial implications including

those related to subsequent management and maintenance requirements of the proposals. Among others measures, the need to reinstate affected fishponds and other aquaculture sites; and

- (x) determine the need, if necessary, make appropriate recommendation for a monitoring and audit programme.

3.5.8 Impact on Cultural Heritage

3.5.8.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing impacts on cultural heritage as stated in section 2 of both Annexes 10 and 19 of the TM respectively.

3.5.8.2 The heritage impact assessment shall focus on

- (i) identification of landscape features include sites of historical events, historical field patterns, tracks and fishponds and cultural elements such as *fung shui* woodlands and clan grave sites which will be affected by the proposed development;
- (ii) evaluation of impacts on cultural heritage and proposals for any mitigation measures with detailed elaboration on scope of work.

3.5.8.3 Direct and indirect impacts on the nearby historic buildings and structures i.e. the Tin Hau Temple at Ng Uk Tsuen and additional village houses at Ng Uk Tsuen, Shing Uk Tsuen and Tai Tseng Wai, should also be identified. The impacts include visual impact, impacts on the *fung shui* / visual corridor of the historic buildings and structures, potential damage to historic buildings and structures through change of water-table, vibration caused by the development. Assessment of impacts on cultural heritage shall also take full account of, and allow where appropriate, the Guidelines for Landscape and Visual Impact Assessment of Annex 18 of the TM.

3.5.9 Landscape and Visual Impact

3.5.9.1 The Applicant shall follow the criteria and guidelines for evaluating and assessing landscape and visual impacts as stated in Annexes 10 and 18 of the Technical Memorandum.

3.5.9.2 The assessment area for the landscape impact assessment shall include all areas within a 500m distance from the boundary of the proposed development (including the access road) as shown in Figure 1. The assessment area for the visual impact assessment shall be defined by the 2-km radius visual envelope or the existing viewshed by natural /man-made features from the proposed project and associated works.

3.5.9.3 The Applicant shall review relevant outline development plans, outline zoning plans, layout plans, planning briefs and studies which may identify areas of high landscape value and recommend conservation area, green belt, recreation, open space and other specified use (Wetland Park). Any guidelines on urban design

concept, landscape framework, designated view corridors that may affect the appreciation of the project should also be reviewed. The aim is to gain an insight to the future outlook of the area so that the project can fit into surrounding setting. Any conflict with statutory town plan(s) should be highlighted and appropriate follow-up action should be recommended.

- 3.5.9.4 The Applicant shall describe, appraise and analyse the existing landscape resources and character of the assessment area. The sensitivity of the landscape framework and its ability to accommodate change shall be particularly focused on. A system should be derived for judging impact significance. The Applicant shall identify the degree of compatibility of the proposed project with the existing landscape, specifically taking into account the high rise nature of part of the development. The assessment shall quantify the potential landscape impacts as far as possible, so as to illustrate the significance of such impacts arising from the proposed project. Clear mapping of the landscape impact is required.
- 3.5.9.5 The Applicant shall assess the visual impacts of the proposed project(s). The Applicant shall assess the visual impacts of the proposed projects based on different scenarios as described below :Clear illustrations of visual impact assessment are required. The assessment shall include the following:
- (i) identification of the key groups of sensitive receivers (including planned sensitive receivers, e.g. Tin Shui Wai Wetland Park) within the visual envelope and their views at ground level and elevated vantage points;
 - (ii) description of the visual compatibility of the project with the surrounding, and the planned setting and its obstruction and interference with the key views of the adjacent areas; and
 - (iii) the severity of visual impacts in terms of distance, nature and number of sensitive receivers. Nighttime glare shall be considered in the assessment. The visual impacts of the project with and without mitigation measures shall also be included so as to demonstrate the effectiveness of the proposed mitigation measures.
 - (iv) examination of alternative building height ranging from 10 storeys to 25 storeys to assess how the development is visually compatible with the surrounding rural setting. The various building height scenarios are :
 - ◆ all developments below 10 storeys
 - ◆ all developments below 15 storeys
 - ◆ all developments below 25 storeys

To facilitate the visual impact assessment, illustrative materials showing the outline and disposal of building blocks, architectural features, building height and inter-connection of building structures would be required.

- 3.5.9.6 The Applicant shall evaluate the merits of preservation in totality, in parts or total destruction of existing landscape and the establishment of a new landscape character of the area. In addition, alternative design that would avoid or reduce the identified landscape and visual impacts shall be evaluated for comparison before adopting other mitigation or compensatory measures to alleviate the impacts. The Applicant shall recommend mitigation measures to minimize the adverse effects identified above, including provision of a landscape design. The mitigation

measures shall include provision of screen planting and road side berms, revegetation of disturbed land, compensatory planting, provisioning of amenity areas and open spaces, provision of finishes to structures, deposition of buildings, colour scheme and texture of material used and any measures to mitigate the impact on existing land use. Parties shall be identified for the on going management and maintenance of the proposed mitigation works to ensure their effectiveness throughout the operation phase of the project. The mitigation measures proposed shall not only be concerned with damage reduction but should also include consideration of potential enhancement of existing landscape. A practical programme and funding proposal for the implementation of the recommended measures shall be provided.

- 3.5.9.7 Coloured perspective drawings, plans and section/elevation diagrams, annotated oblique aerial photographs, photo-retouching and computer-generated photomontage shall be adopted to fully illustrate the landscape and visual impacts of the proposed project(s) to the satisfaction of the Director. All computer graphics shall be compatible with Microstation DGN file format. The Applicant shall record the technical details such as system set-up, software, data files and function in preparing the illustration which may need to be submitted for verification of the accuracy of the illustrations.

3.5.10 Impacts Summary

To facilitate easy retrieval of important information, an impacts summary in the form of a table, or any other form approved by the Director, showing the assessment points, results of impact predictions, relevant standard or criteria, extent of exceedance predicted, if any, mitigation measures proposed and residual impacts, if any, after mitigation measures are implemented, etc., should be given at the end of each chapter on individual impact in the EIA report as well as the Executive Summary.

3.5.11 Summary of Environmental Outcomes

The EIA report shall contain a summary of the key environmental outcomes arising from the EIA study, including the population and environmentally sensitive areas protected, environmentally friendly designs recommended, key environmental problems avoided, compensation areas included and the environmental benefits of environmental protection measures recommended.

3.5.12 Environmental Monitoring and Audit (EM&A) Requirements

3.5.12.1 The Applicant shall identify and justify in the EIA study whether there is any need for EM&A and environmental management system (EMS) activities during the construction and operation phases of the proposed developments and, if affirmative:

- (i) to define the scope of the EM&A requirements for the proposed developments in the EIA study; and
- (ii) to set out the EMS requirements for the construction and operation of the proposed developments to achieve satisfactory environmental performance.

3.5.12.2 Subject to the confirmation of EIA study findings, the Applicant shall comply with the requirements as stipulated in Annex 21 of the TM.

3.5.12.3 The Applicant shall prepare a project implementation schedule (in the form of a checklist as shown in Appendix 3 or as approved by the Director) containing all the EIA study recommendations and mitigation measures with reference to the implementation programme. To facilitate issue of Environmental Permits (EPs) in future, the implementation schedules shall be grouped under individual works packages in separate DPs where applicable.

3.5.13 Monitoring and Audit Requirement of the Proposed Developments

The Applicant should note the monitoring and audit requirement stipulated in paragraph 8.1 of the TM. The Proponent shall proposed an environmental monitoring and audit programme in the EIA report to verify the predictions and the effectiveness of mitigation measures including audit on compliance during the operation phase of the project.

4. DURATION OF VALIDITY

This EIA study brief is valid for 24 months from the date of issue. If the EIA study does not commence within this period, the Applicant shall apply to the Director for another EIA study brief afresh before commencement of the EIA study.

5. REPORT REQUIREMENTS

- 5.1 In preparing the EIA report, the Applicant shall refer to Annex 11 of the TM for the contents of an EIA report. The Applicant shall also refer to Annex 20 of the TM which stipulates the guidelines for the review of an EIA report.
- 5.2 The Applicant shall supply the Director with the following number of hard copies of the EIA report and the Executive Summary:
- (i) 30 hard copies of the EIA report in English and 60 hard copies of the Executive Summary (each bilingual in both English and Chinese) as required under section 6(2) of the EIAO to be supplied at the time of application for approval of the EIA report, unless advised otherwise by the Director;
 - (ii) where necessary, addendum to each copy of the EIA report and the Executive Summary submitted in (i) above, upon advice by the Director.
 - (iii) for the purpose of the public inspection required under section 7(1) of the EIAO, 30 hard copies of the EIA report and 60 hard copies of the Executive Summary (each bilingual in both English and Chinese), including any addendum if required in section 5.2 (ii) above, to be supplied to the locations stipulated in the “Guidance Note on Advertisement and Public Inspection of Documents” issued under the EIAO, unless advised otherwise by the Director;
 - (iv) 20 hard copies of the EIA report in English and 50 hard copies of the Executive Summary (each bilingual in both English and Chinese), including

any addendum if required in section 5.2 (ii) above, to be supplied to the Secretary of Advisory Council on the Environment (ACE), upon advice by the Director for consultation with the ACE, as required under section 7(5) of the EIAO.

- (v) 5 hard copies of the EIA report in English and 10 hard copies of Executive Summary (each bilingual in both English and Chinese), with any addendum if required in section 5.2 (ii) above, for deposition in the Register, if and when the EIA report is approved by the Director, as required under section 8(5) of the EIAO.
- 5.3 The Applicant shall make additional hard copies of the above documents available to the public, subject to payment by the interested parties of full costs of printing.
- 5.4 In addition, to facilitate public inspection of the EIA Report via the EIAO Internet Website, the Applicant shall provide electronic copies of both the EIA Report and the Executive Summary Report prepared in HyperText Markup Language (HTML) (version 4.0 or later) and in Portable Document Format (PDF version 4.0 or later), unless otherwise agreed by the Director. For the HTML version, a content page capable of providing hyperlink to each section and sub-section of the EIA Report and the Executive Summary Report shall be included in the beginning of the document. Hyperlinks to all figures, drawings and tables in the EIA Report and Executive Summary shall be provided in the main text from where the respective references are made. All graphics in the report shall be in interlaced GIF format unless otherwise agreed by the Director.
- 5.5 The electronic copies of the EIA report and the Executive Summary shall be submitted to the Director at the time of application for approval of the EIA Report.
- 5.6 When the EIA Report and the Executive Summary are made available for public inspection under section 7(1) of the EIA Ordinance, the content of the electronic copies of the EIA Report and the Executive Summary must be the same as the hard copies and the Director shall be provided with the most updated electronic copies.
- 5.7 To promote environmentally friendly and efficient dissemination of information, both hard copies and electronic copies of future EM&A reports recommended by the EIA study shall be required and their format shall be agreed by the Director.

6. OTHER PROCEDURAL REQUIREMENTS

- 6.1 During the EIA study, if there is any change in the name of Applicant for this EIA study brief, the Applicant in this study brief must notify the Director immediately.
- 6.2 If there is any key change in the scope of the project mentioned in section 1.2 and section 1.3 of this EIA study brief and in Project Profile No. PP-091/2000, the Applicant must seek confirmation from the Director in writing on whether or not the scope of issues covered by this EIA study brief can still cover the key changes, and the additional issues, if any, that the EIA study must also address. If the changes to the project fundamentally alter the key scope of the EIA study brief, the Applicant shall apply to the Director for another EIA study brief afresh.

Environmental Impact Assessment Ordinance (Cap. 499)

Proposed Development at Fung Lok Wai, Yuen Long at
Lot 1457 RP in DD123
ESB-055/2000

EIA Study Brief

--- END OF EIA STUDY BRIEF ---

July 2000
Environmental Assessment and Noise Division,
Environmental Protection Department