



## **1. INTRODUCTION**

### **1.1 Project Background**

- 1.1.1 In 2002, the Environmental Protection Department (EPD) carried out the Outlying Islands Sewerage Master Plan Stage 2 Review (SMP Stage 2 Review), and completed the Preliminary Project Feasibility Study for Outlying Islands Sewerage Stage 2 (hereinafter referred to as “PPFS”).
- 1.1.2 In February 2008, Drainage Services Department (DSD) commenced the Investigation Stage of “Upgrading of Cheung Chau and Tai O Sewage Collection, Treatment and Disposal Facilities” under Agreement No. CE 31/2007 (DS) by commissioning a consultant to carry out review on the conclusions and recommendations of the PPFS report, surveys, investigations, impact assessments, preliminary environmental review and preliminary design of the recommended works (hereinafter referred to as “Investigation Consultancy”).
- 1.1.3 In December 2010, Drainage Services Department (DSD) commissioned Atkins China Limited (ACL) to undertake Design and Construction of “Upgrading of Cheung Chau and Tai O Sewage Collection, Treatment and Disposal Facilities” under Agreement No. CE 15/2010 (DS).

### **1.2 Background to this EIA**

- 1.2.1 The Preliminary Environmental Review (PER) conducted during the Investigation Consultancy has identified the potential environmental issues, such as air quality, noise, water quality, waste management implication, land contamination, ecology, fisheries, cultural heritage, landscape and visual, arising from the sewerage upgrading works and the likely environmental mitigation measures required.
- 1.2.2 The PER has identified the designated project (DP) status of the Upgrading of Tai O Sewage Collection, Treatment and Disposal Facilities components under the Environmental Impact Assessment Ordinance (EIAO).
- 1.2.3 An Environmental Impact Assessment (EIA) Study Brief No. ESB-211/2009 was issued to cover the upgrading of Tai O Sewage Collection, Treatment and Disposal Facilities (hereinafter referred as the “Project”). According to Section 3.2.1 of the Study Brief No. ESB-211/2009, the scope of the EIA Study should cover the works elements listed in Section 1.2 of the EIA Study Brief, which are:
- Site formation works (including potential reclamation of 0.23ha, seawall of 100m length, berthing area and the likes);
  - Expansion and upgrading of existing Tai O Sewage Treatment Works (STW) to secondary treatment level and construction of a new submarine sewage outfall;
  - Construction of two new sewage pumping stations (SPS) at Hang Mei and Fan Kwai Tong, the associated rising mains and new sewerage system to various unsewered areas including Hang Mei, Wang Hang Tsuen, Leung Uk Tsuen, Nam Chung Tsuen, Fan Kwai Tong and scattered unsewered areas in Shek Tsai Po and Tai O Town in Tai O; and
  - Construction of effluent reuse facilities.
- 1.2.4 This EIA Report provides the approach, findings and recommendations of the EIA Study and has followed the requirements of EIA Study Brief No. ESB-211/2009. This EIA Study covers the works items for the sewerage upgrading works that comprised of the DP components as well as non-DP components. Environmental Permits (EPs) are required before the construction and operation of the DP



components of the Project can commence. The DP and non-DP components of the Project are summarized in **Table 1.1**.

**Table 1.1 : Designated Project Status of the Project Components**

Project Components	DP / Non-DP	Remarks
Expansion and Upgrading of Tai O Sewage Treatment Works	Non-DP	Installed capacity is less than 5000 m <sup>3</sup> per day.
Construction of submarine outfall of Tai O STW	DP	Schedule 2 Part 1 Item F.6 of the EIAO
Construction of Hang Mei SPS	Non-DP	Installed capacity would not exceed 2000 m <sup>3</sup> per day.
Construction of Fan Kwai Tong SPS	Non-DP	Installed capacity would not exceed 2000 m <sup>3</sup> per day.
Sewers works (near Nam Chung Tsuen)	DP	Sewers works would fall partly within any of the sensitive areas (i.e. a conservation area) as stated in Schedule 2 Part 1 Item Q.1 of the EIAO.
Sewers works (Remaining sewers works in Tai O)	Non-DP	Sewers works would not fall partly within any of the sensitive areas (i.e. a conservation area) as stated in Schedule 2 Part 1 Item Q.1 of the EIAO.
Effluent reuse facilities within the Tai O STW	DP	Schedule 2 Part 1 Item F.4 of the EIAO

### 1.3 Purpose and Approach of the EIA Study

1.3.1 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 Project and its related activities. This information will contribute to decisions by the Director of Environmental Protection on:

- The overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;
- The conditions and requirements for the detailed design, construction and operation of the Project to mitigate against adverse environmental consequences; and
- The acceptability of residual impacts after implementation of the proposed mitigation measures.

1.3.2 This EIA Study has been conducted to achieve specific objectives in the EIA Study Brief No. ESB-211/2009. These specific objectives are:

- (i) to describe the Project and associated works together with the requirements and environmental benefits for carrying out the Project and the types of designated projects to be covered by the Project;
- (ii) to identify and describe elements of community and environment likely to be affected by the Project and/or likely to cause adverse impacts to the Project,



- including natural and man-made environment and the associated environmental constraints;
- (iii) to provide information on the consideration of alternative options of the design, layout, location, alignment, scale and extent of the Project and the construction methods with a view to avoiding or minimizing potential environmental impacts to environmentally sensitive areas and sensitive uses; to compare the environmental benefits and disbenefits of different options; to provide reasons for selecting the preferred option(s) and to describe the part environmental factors played in the selection of preferred option(s);
  - (iv) to identify and quantify emission sources (including air quality, noise, water quality and waste, etc. as appropriate) and determine the significance of impacts on sensitive receivers and potential affected uses;
  - (v) to identify and quantify any potential loss or damage and other potential impacts to ecology and fisheries resources, flora, fauna and natural habitats and to propose measures to mitigate these impacts;
  - (vi) to identify any potential landscape and visual impacts and to propose measures to mitigate these impacts;
  - (vii) to identify any negative impacts on historical and archaeological resources and to propose measures to mitigate these impacts;
  - (viii) to identify any potential human health impacts and to propose measures to mitigate these impacts;
  - (ix) to propose provision of mitigation measures so as to minimize pollution, environmental disturbance and nuisance during construction and operation of Project;
  - (x) to investigate the feasibility, practicability, effectiveness and implications of the proposed mitigation measures;
  - (xi) to identify, predict and evaluate the residual environmental impacts (i.e. after practicable mitigation) 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;
  - (xii) 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 cumulative effects and reduce them to acceptable levels;
  - (xiii) to investigate the extent of the secondary environmental impacts that may arise from the proposed mitigation measures and to identify constraints associated with the mitigation measures recommended in the EIA study, as well as the provision of any necessary modification; and
  - (xiv) to design and specify environmental monitoring and audit requirements to check the effective implementation of the recommended environmental protection and pollution control measures.

## **1.4 Structure of this EIA Study Report**

1.4.1 The backgrounds, descriptions and justifications of this Project are provided in **Section 2**. The assessment results and recommended mitigation measures for each of the environmental parameters that have been identified are presented in the following sections:

- Section 3 - Air Quality
- Section 4 - Noise



- Section 5 - Water Quality
- Section 6 - Waste Management
- Section 7 - Land Contamination
- Section 8 - Ecology
- Section 9 - Fisheries
- Section 10 - Cultural Heritage
- Section 11 - Landscape & Visual
- Section 12 - Environmental Monitoring and Audit Requirements
- Section 13 - Implementation Schedule of Recommended Mitigation Measures
- Section 14 - Summary of Environmental Outcomes and Overall Conclusions

1.4.2 All quoted appendices and figures of this EIA are presented under separate covers, which are Volume 2 of 3 and Volume 3 of 3 respectively.