Annex A

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Environmental Impact Assessment Ordinance (Cap. 499)
Environmental Impact Assessment Report

Outlying Islands Sewerage Stage 2
South Lantau Sewerage Works

PURPOSE

This paper presents the key findings and recommendations of the Environmental Impact Assessment (EIA) report for the proposed sewerage works at South Lantau (the Project) submitted under Section 6(2) of the Environmental Impact Assessment Ordinance (EIAO) (Application No. EIA-246/2016). The Drainage Services Department (DSD) (the Applicant) and its consultants will present the EIA report at the meeting of the EIA Subcommittee.

ADVICE SOUGHT

2. Members' views are sought on the findings and recommendations of the EIA report. The Environmental Protection Department (EPD) will take into account comments from the public and the Advisory Council on the Environment (ACE) in deciding whether or not to approve the EIA report under Section 8(3) of the EIAO.

BACKGROUND

3. There is currently no sewerage system serving the South Lantau area. Sewage and wastewater from most of the local premises are treated and disposed of by means of private septic tanks or sewage treatment systems (STS). In following up the Outlying Islands Sewerage Master Plan Stage 2 Review (SMP Review Study) in 2001 and the further review under the Review of Sewerage Scheme for South Lantau (Review Study)

in 2008, the Applicant has proposed to provide centralized public sewerage system for proper collection, treatment and disposal of the sewage arising from the Project Catchment Area, which includes the traditional villages of Shui Hau, Tong Fuk, Cheung Sha Lower Village, Cheung Sha Upper Village, San Shek Wan, Pui O Lo Uk Tsuen, Pui O San Wai, Pui O Lo Wai and Ham Tin.

4. With respect to the Applicant's submission of the EIA report of the Project for approval, the EPD in conjunction with the relevant authorities, considered that the EIA report met the requirements of the EIA Study Brief and the Technical Memorandum on EIA Process (TM), for the purpose of exhibiting the report for public inspection, under Section 7(4) of the EIAO.

NEED FOR THE PROJECT

5. Provision of proper sewerage systems to unsewered areas subject to availability of resources is a general Government policy. The proposed sewerage works will avoid potential environmental problems arising from ineffective treatment or insufficient maintenance of private STS, resulting in improved local hygiene conditions and better coastal water quality.

DESCRIPTION OF THE PROJECT

6. The Project comprises the development of village and trunk sewerage works, sewage pumping station (SPS), sewage treatment works (STW) and associated submarine outfall for discharge of treated effluent. The location and general layout of the Project is shown in **Figure 1**. The key components of the Project include :

(i) Provision of a STW with design capacity of about 5,800 m^3 per day at average dry weather flow with effluent reuse facilities and a 1.1 km long new submarine outfall;

(ii) Provision of six SPSs with design capacities ranging from about 620 m^3 per day to 3,840 m^3 per day at average dry weather flow;

(iii) Provision of gravity sewers for village sewerage system of about 16 km in length; and

(iv) Provision of trunk sewers of about 7.5 km in length and twin rising mains of about 7.5 km in length underneath the South Lantau Road and Chi Ma Wan Road.

7. The Project covers the following elements that are Designated Projects (DP) under Part I, Schedule 2 of the EIAO :

(i) Item C.12 – A dredging operation which is less than 500m from the nearest boundary of an existing or planned coastal protection area;

(ii) Item F.2 – Sewage treatment works with an installed capacity of more than 5,000 m^3 per day; and a boundary of which is less than 200m from the nearest boundary of an existing or planned residential area; or bathing beaches;

(iii) Item F.3 – Sewage pumping stations with capacity of more than 2,000 m^3 per day; and a boundary of which is less than 150m from residential area; or bathing beaches;

(iv) Item F.4 – An activity for the reuse of treated sewage effluent from a treatment plant; and

(v) Item F.6 – A submarine sewage outfall.

ENVIRONMENTAL BENEFITS

8. According to the EIA report, the Project will bring about the following benefits upon its completion :

(i) The advanced technologies adopted for the proposed sewerage system will enhance the reliability of sewage treatment and safeguard the treated effluent quality, as well as maximize the reuse of reclaimed water; and

(ii) The centralized sewage treatment equipped with odour treatment will improve living quality and environmental hygiene in the South Lantau Project Catchment Area, and avoid potential environmental nuisances arising from existing private STS.

CONSIDERATION OF ALTERNATIVE OPTIONS

9. The EIA report has considered various alternative options for the development of the Project, including different site locations, sewerage facilities designs and alignments, construction methodologies and programmes, in order to avoid or minimize adverse environmental impacts. The environmental benefits and dis-benefits of the options have been evaluated. The recommended options of various project items have taken into account environmental considerations, site constraints, other factors such as operational requirements and engineering considerations. Some of the key approaches that have been adopted by the Applicant to avoid or minimize environmental impacts are summarized below :

Avoidance of Impacts

(i) Emergency discharge of untreated sewage during equipment or power failure will be avoided by providing standby pump and screen, dual power supply and emergency storage; and

(ii) Project encroachment into habitats of high ecological value will be avoided during both construction and operation phases, particularly ecological sensitive receivers such as Lantau South Country Park.

Minimization of Impacts

(iii) A deep sewer option is selected to minimize the Project's physical footprint through reducing the number of SPSs;

(iv) Bridge mounted type and trenchless techniques are adopted for sewer works in streams at Tong Fuk and Pui O to avoid physical disturbance to these habitats;

(v) Where suitable, facilities will be housed underground and inside a single multi-storey superstructure to minimize the scale and size of above-ground structure of SPS and the STW;

(vi) Disturbance to sensitive receivers and natural habitats will be reduced by constructing the trunk sewers and rising mains underneath existing roads; and,

(vii) Potential impacts on water quality, marine ecology and fisheries will be minimized through adoption of horizontal directional drilling (HDD) to reduce dredging for construction of the submarine outfall.

SPECIFIC ENVIRONMENTAL ASPECTS TO HIGHLIGHT

Water Quality Impact

10. As recommended in the EIA, a non-dredged HDD method will be adopted for the major section of the proposed submarine outfall to reduce potential impact on the marine environment. During dredging and installation of the outfall diffuser, closed grab dredgers and silt curtains will be used to minimize the potential water quality impact arising from these marine works.

11. During the operation phase of the Project, sewage will be collected and treated to secondary level in the centralized STW, the treated effluent will then be discharged through a submarine outfall with diffuser located around 1.1 km from shores. It is anticipated that near shore water quality will be improved as a result.

12. Precautionary measures have been recommended in the EIA report to avoid the likelihood of emergency discharge during the operation of the Project. These measures include provision of backup storage for raw sewage, dual power supply and standby facilities for the sewage treatment facility units. An Emergency Response Plan will be prepared and implemented by the Applicant in the unlikely events of emergency discharge during the operation phase.

13. The EIA report concludes that there will not be unacceptable adverse water quality impact during both the construction and operation phases.

Marine Ecological and Fisheries Impact

14. During construction, adverse marine ecological and fisheries impact will be avoided or minimized as far as practicable. Although a small area (about 0.13 ha) of sub-tidal soft bottom habitats will still be permanently lost due to the diffuser installation, no species of conservation importance were identified within the area. There will be no direct impact on the existing fish culture zone at Cheung Sha Wan, which is located about 4 km away from the outfall.

15. Mitigation measures during construction for minimizing water quality impact (i.e. HDD for submarine outfall, adoption of silt curtain and closed grab dredger) will also minimize potential impact on marine ecology and fisheries.

16. The EIA report concludes that there will be no unacceptable adverse impact on marine ecology and fisheries during both the construction and operation phases.

Terrestrial Ecological Impact

17. The Project site does not encroach onto any habitats of conservation importance such as mangroves, *fung shui* woodlands, or the Lantau South Country Park. Hence, potential adverse ecological impact is not anticipated.

18. During construction of STW and SPSs, approximately 0.5 ha of mixed woodland will be affected. The EIA report recommends reserving 0.11 ha of land within the site boundary of STW and about 1 ha of shrubland-grassland habitat to the southwest of STW as compensatory measures, with details of the compensatory planting scheme to be formulated during the detailed design stage. With the implementation of recommended mitigation measures, the EIA report concludes that there will not be unacceptable adverse ecological impact during both the construction and operation phases.

Noise Impact

19. For construction noise, the TM stipulates that the daytime construction noise criteria for Noise Sensitive Receiver (NSR) on any days not being a general holiday shall be met as far as practicable. The EIA predicts that under the worst-case scenario, the construction noise impact on approximately 20 NSRs including village houses and a public school may not be able to be contained within the day time construction noise criteria for some time periods, mainly due to the close proximity of construction works to these NSRs during pavement breaking, excavation and sewer laying works. In accordance with the TM requirement, the Project proponent has been required to exhaust all practicable mitigation measures to minimize the construction noise impact. Noise mitigation measures explored in the EIA report include the use of quiet construction equipment, movable noise barriers, noise insulation sheet, proper scheduling of construction activities and expandable demolition agent. All practicable measures will be employed to reduce the noise disturbance to the practicable minimum. With the implementation of the measures, the exceedance will be transient and short

term. The Applicant has also undertaken to review the construction programme during the implementation stage and carry out noise monitoring during construction to ensure that follow-up action will be implemented to minimize disturbance to the NSRs. With all these measures in place, adverse residual construction noise impact arising from the Project would be contained as far as practicable.

20. The EIA report concludes that there will be no adverse noise impact during the operational phase as all noisy plants will be enclosed within building structures.

Air Quality Impact

21. With the implementation of standard construction practices and mitigation measures including water spraying and covering dusty stockpiled materials, the EIA report predicts that the dust levels at representative air sensitive receivers (ASRs) will comply with the stipulated criteria for Total Suspended Particulates, Respirable Suspended Particulates and Fine Suspended Particulates.

22. With the implementation of odour control measures including enclosure of odour emission sources and installation of de-odorization units with 99.5% odour removal efficiency, the odour impacts arising from the operation of the STW and the SPSs are considered insignificant. According to the EIA report, the predicted odour levels at all the ASRs will comply with the odour criterion (5 odour units based on an averaging time of 5 seconds) stipulated in the TM.

23. Thus, the EIA report concludes that there will not be unacceptable adverse air quality impact during both the construction and operation phases.

Waste Management

24. About 246,000m^3 of excavated materials will be generated from construction activities including gravity pipes, manholes, trunk sewers and twin rising mains, SPSs and STW. Approximately 70% of suitable inert fill material will be stored and reused on-site. The remainder will be sent to public fill reception facilities. A trip-ticket system together with a stringent EM&A programme will be adopted to monitor the reuse and disposal of surplus excavated materials and to avoid fly-tipping especially at the ecological sensitive areas. With the implementation of recommended mitigation measures including standard site practice, management of waste disposal and reduction of construction and demolition material generation during construction phase, the EIA report concludes that unacceptable adverse impact is not anticipated.

Other Environmental Impacts

25. Other environmental impacts including cultural heritage and landscape and visual are relatively minor and have also been addressed in the EIA report. With the implementation of recommended mitigation measures, the EIA report concludes that the Project will comply with the relevant requirements under the TM.

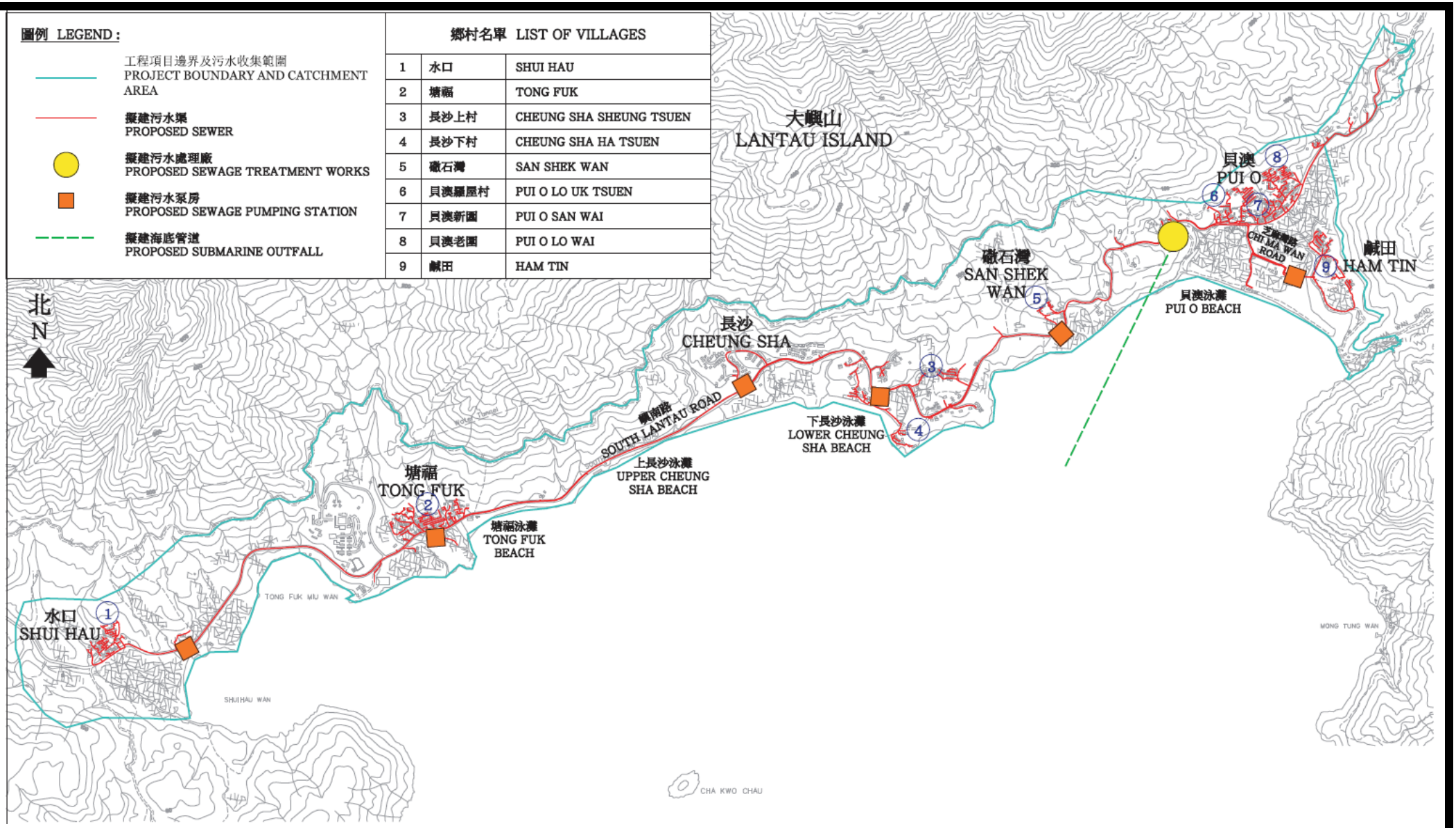
ENVIRONMENTAL MONITORING AND AUDIT

26. The EM&A Manual included in the EIA report recommends an EM&A programme for both the construction and operation phases of the Project. Key recommended EM&A requirements cover air quality, noise, water quality, waste management, ecology, landscape and visual and culture heritage.

PUBLIC CONSULTATION

27. The Applicant made the EIA report, EM&A Manual and Executive Summary available for public inspection under the EIAO from 18 November 2016 to 17 December 2016. During this inspection period, four sets of public comments including one objection were received by the EPD. The main concerns raised by the public are on ecology and waste management. The public comments will be summarized in a gist to be provided to the ACE before the meeting.

February 2017
Environmental Assessment Division
Environmental Protection Department



Project Title: Outlying Islands Sewerage Stage 2 – South Lantau Sewerage Works
Figure 1: Project Location Plan

Application No. : EIA-246/2016
[Note: This figure is extracted from the EIA Report – ES (Figure 1.1)]