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# 1 INTRODUCTION

## 1.1 Project Background

1.1.1.1 The Government plans to develop Hung Shiu Kiu / Ha Tsuen New Development Area (HSK/HT NDA) for providing land to meet the medium and long-term housing, social and economic needs. The HSK/HT NDA is proposed to accommodate a population of approximately 176,000 persons and generate about 150,000 employment opportunities on full development.

1.1.1.2 The Civil Engineering and Development Department (CEDD) commenced Agreement, namely the Agreement No. CE 2/2011 (CE) "Hung Shui Kiu New Development Area, Planning and Engineering – Investigation" in 2011, to formulate the detailed development proposals for the HSK/HT NDA. This Study recommends that the sewage generated from the HSK/HT NDA will be discharged to separate new sewage treatment work, namely the Hung Shui Kiu Effluent Polishing Plant (HSKEPP) which is located in the western side of the HSK/HT NDA.

1.1.1.3 The above study recommended preliminary treatment capacity, treatment level and discharge arrangement of HSKEPP taking into account the constraints for discharge to North Western Waters and Deep Bay. Further reviews of flow projection, treatment level, treated effluent discharge and sludge treatment scheme shall be carried out to formulate the preliminary design of HSKEPP to cater for the sewage collected from the new developments within the HSK/HT NDA and other developments in the North West New Territories (NWNT) to support the medium and long-term housing and economic needs of the NWNT.

1.1.1.4 AECOM Asia Co Ltd. was commissioned by Drainage Services Department (DSD) on 27 March 2020 to carry out this Assignment for the investigation for HSKEPP. Site location plan of the HSKEPP is shown in **Figure 1.1**.

## 1.2 Designated Projects under EIAO

1.2.1.1 A Project Profile (No. PP-575/2019) was submitted to the Environmental Protection Department (EPD) on 1 February 2019 for application for an Environmental Impact Assessment (EIA) Study Brief under section 5(1)(a) of the Environmental Impact Assessment Ordinance (EIAO) and the EIA Study Brief No. ESB-312/2019 for the Project was issued on 15 March 2019 under the EIAO.

1.2.1.2 The Project comprises the following element which is classified as Designated Project (DP) under Schedule 2, Part I of the EIAO. The DP of this Project is summarized in **Table 1.1**.

**Table 1.1 Schedule 2 Designated Projects in this Project**

| Schedule 2 Designated Project | | Designated Project Element under the Project |
|---|---|---|
| Item F.1 | Sewage treatment works with an installed capacity of more than 15,000 $m^3$/day. | The proposed treatment capacity of HSKEPP would be 90,000 $m^3$/day. |

## 1.3 Purpose of this Executive Summary

1.3.1.1 This Executive Summary (ES) summarizes the findings, recommendations and conclusions of the EIA Report for the Project.

# 2 PROJECT DESCRIPTION

## 2.1 Purpose and Scope of Project

2.1.1.1 The purpose of the Project is to provide sewage treatment to the sewage collected from the HSK/HT NDA and other developments in the NWNT, and to subsequently dispose the treated effluent.

2.1.1.2 HSK/HT NDA has reserved about 5.2 hectares of land for the proposed HSKEPP, the location of which is shown in **Figure 1.1**. According to the HSK/HT NDA's Revised Recommended Outline Development Plan (RODP), HSKEPP is located at the western part of HSK/HT NDA. It is bounded by Yuen Tau Shan and Kong Sham Western Highway at its southwest side and surrounded by logistic facilities at its north and west direction. HSKEPP is located within the Logistics, Enterprise and Technology Quarter. There will be a green belt to its south side.

2.1.1.3 The proposed rising main for raw sewage and emergency bypass pipe to Tin Shui Wai Nullah, as shown in **Figure 1.1,** are not under the scope of the Project. The site formation works for the HSKEPP site (except the demolition of existing San Wai Preliminary Treatment Works (SWPTW)) is also not under the scope of the Project.

2.1.1.4 The proposed works of the Project comprise:

1) Demolition of existing structures and buildings within SWPTW for construction of HSKEPP facilities;
2) Construction of a sewage treatment plant with a maximum capacity of Average Dry Weather Flow (ADWF) up to 90,000 $m^3$/day;
3) Construction of sludge treatment facilities for treating sludge generated from HSKEPP and additional sludge generated from the San Wai Sewage Treatment Works (STW) and other nearby STWs;
4) Construction of facilities for receiving and anaerobic co-digesting pre-treated food waste;
5) Construction of effluent discharge pipe connecting to the existing discharge tunnel of San Wai STW; and
6) Associated ancillary works.

## 2.2 Need and Benefits of the Project

2.2.1.1 The Government plans to develop Hung Shiu Kiu / Ha Tsuen New Development Area (HSK/HT NDA) for providing land to meet the medium and long-term housing, social and economic needs. The HSKEPP is proposed to site at the HSK/HT NDA to optimize the development potential to meet the territory's need, and to improve the local living environment with infrastructure. Having considered the new developments in HSK/HT NDA and the associated population growth, the projected ADWF will reach approximately 90,000 $m^3$/day at HSKEPP in Year 2038.

2.2.1.2 Upon the completion of HSKEPP, it will provide sewage treatment to the sewage generation from the population and development of HSK/HT NDA and other developments in the NWNT. With the planned treatment capacity and high effluent quality, sewage from future developments within HSKEPP catchment can be handled properly.

2.2.1.3 With secondary plus treatment level at HSKEPP, the treated effluent will be normally discharged via the existing NWNT Discharge Tunnel to Urmston Road submarine outfall,

which avoids any extra pollution loadings to the Deep Bay. With the secondary plus effluent standard, the residual pollutants will be reduced and protect the water quality of both North Western and Deep Bay Water Control Zones.

2.2.1.4 HSKEPP will give higher treatment efficiency and cost effectiveness as well as improve the living environment of its surrounding areas. With the enhancement of odour management of the HSKEPP (covering all odorous facilities and installation of deodorization units), odour nuisance to the surrounding area would be effectively controlled and minimized.

2.2.1.5 As a sustainability consideration, food waste/sewage sludge anaerobic co-digestion within HSKEPP will be adopted to enhance energy recovery from the anaerobic digestion process. Additional facilities for food waste/sewage sludge anaerobic co-digestion, including reception facilities, digesters and dewatering facilities, will be located within the HSKEPP's footprint.

## 2.3 Consideration of Alternative Design and Layout

### 2.3.1 Sewage Treatment

2.3.1.1 The treatment option evaluation mainly focuses on the biological treatment processes as this is the critical part in HSKEPP layouts.

2.3.1.2 A preliminary review of potential biological treatment processes, including proven treatment processes, market availability, overseas and local experiences and the emerging treatment process, have been conducted. Two major options of biological treatment process for the HSKEPP were considered, including:

- Conventional Activated Sludge (CAS)
- Compacted-type technologies

2.3.1.3 In considering the footprint for various biological treatment options, CAS will produce considerably larger volume of excavation materials and result in longer construction period. Thus, compacted-type technologies were recommended.

### 2.3.2 Sludge Treatment

2.3.2.1 Sludge cake generated from anaerobic co-digestion of HSKEPP's treatment of sewage sludge and food waste will be delivered to the Sludge Treatment Facility (STF) in Tuen Mun for incineration. Prior to conveyance to the STF, the following handling options are considered:

- Dewatering with prior anaerobic co-digestion of food waste and sewage sludge
- Direct dewatering without digestion

2.3.2.2 Anaerobic digestion is recommended with the environmental benefits of reducing the volume of sludge and food waste to be disposed of at STF, and allow energy recovery from biogas generation for utilization within HSKEPP. Also, the organic contents in digested sludge would be much lower so as to minimize the odour level in the downstream dewatering and offsite disposal process.

### 2.3.3 Consideration of Layout Options

2.3.3.1 For developing of HSKEPP's internal layout, considerations of numerous engineering constraints and environmental factors have been made as below:

- The locations, size and arrangement on new treatment facility is bounded by recommended treatment options. Thus, compacted size treatment facility is provided in the layout.

- In green building consideration, energy recovery from biogas is recommended. Thus, chimneys from combined heat and power (CHP) is required in HSKEPP.
- The required treatment capacity of 90,000 $m^3$/day would determine the size of treatment units and likewise would determine the amount of odour emission and the requirement on deodorization units to cater the odour nuisance due to sewage treatment process.
- Odour emission to be treated by deodourization units are determined by the surface area of the treatment facilities , the air exchange flow rate and the odour emission strength according to odour generation sources such as sewage and sludge tanks. Compacted treatment facilities would assist in reducing the odour emissions with smaller tank sizes.
- Odour extraction rates will be appropriately provided for man-access areas with higher air exchange rates and for non-man-access odour enclosures with lower air exchange rates to reduce the size of the deodourization units necessary to treat the extracted foul air.
- Foul air is treated as close to the emission source as possible with decentralized deodourization units to reduce the footprint required for odour extraction ductwork and to provide optimal deodourization treatment technology for the various types of odour sources.
- The layout of different treatment units is determined with due considerations of not only the process requirements, but also environmental factors, e.g. most of the air emission sources as well as deodourization units are located with as much setback from the site boundary as possible to provide maximum distance between the air emission sources and the sensitive receivers.
- The scale and size of above-ground structures are determined by striking a balance between the plant's hydraulics and visual impacts to the surroundings.

*Consideration of Locations for the New Treatment Facilities*

2.3.3.2 The locations of new treatment facilities spread across two areas, with a larger section at the south of Ha Tsuen Road (the South Section) and a smaller section at the north of Ha Tsuen Road (the North Section), which is currently occupied by San Wai Sewage Treatment Works. In order to minimize the scale of construction, sewage inlet works would be located at the South Section near Ha Tsuen Road to minimise the distance of the incoming sewage rising mains. The effluent discharge point will be located at the North Section near the San Wai STW for connection to NWNT Tunnel. As such, all the sewage treatment facilities (except disinfection facility) and a part of the sludge treatment facility are located in the South Section, while the North Section houses the remaining part of the sludge treatment facility and the disinfection facility with effluent discharge pipe. In addition, all the construction works and new facilities would be within the site boundary to avoid additional project footprint. The new treatment facilities arrangement is then designed under these boundary conditions.

*Avoidance and Reducing Environmental Impacts from Design and Layout*

2.3.3.3 In order to avoid and minimize environmental impacts in terms of air quality, noise, water quality, ecological, landscape and visual aspect, the following major design and layout will be adopted in HSKEPP:

- All the treatment units will be covered and ventilated via deodorization units. Thus, odour impact would be minimized.
- All the treatment facilities and building will be ventilated with silencers at louvers. Thus, fixed noise impact would then be minimized.
- A set of design measures will be installed to avoid and minimize the chance on emergency discharge
- All the treatment units and buildings are designed with due considerations on minimizing the building heights by such means as adopting equipment that requires low headroom. This is to ensure all the aboveground structures would not be excessively bulky so as to minimize the visual impacts

## 2.4 Construction Methods and Sequences of Works

### 2.4.1 Consideration of Site Formation Works

2.4.1.1 The environmental implication of site formation work for the southern portion of HSKEPP is covered in the EIA report no. AEIAR-203/2016 – Hung Shui Kiu New Development Area. On the other hand, the demolition of SWPTW (i.e. the northern portion of HSKEPP) and the subsequent site formation works will be covered in the EIA report.

### 2.4.2 Consideration of Demolition Methods

2.4.2.1 The existing buildings/structures of SWPTW will be demolished for construction of new treatment facilities of HSKEPP. With reference to the Code of Practice for Demolition of Buildings (DCDB, Buildings Department 2004), several main methods of techniques for the demolition works of the Project are identified, including:

- Implosion;
- Breaker (excavator mounted);
- Wrecking ball;
- Cutting and drilling;
- Non-explosive demolition agents;
- Thermal lance; and
- Water jet.

2.4.2.2 Considering the use of breakers (excavator mounted) is efficient and noise and dust impacts can potentially be controlled by a range of practical mitigation measures (e.g. noise barriers, frequent watering of construction area), the breakers (excavator mounted) will be adopted as the preferred demolition method.

### 2.4.3 Consideration of Foundation Methods

2.4.3.1 The foundation options are highly dependent on the ground conditions. According to the available ground information, the site is generally overlaid by fill, alluvium clay, completely decomposed granite (CDG) and slightly/moderately decomposed granite (S/MDG). In considering the geotechnical feasibility, the following foundation methods have been considered:-

- Pre-bored socketed steel H piles (for heavy-duty structures only)
- Percussive piles
- Shallow foundation (for light-duty structures)

2.4.3.2 Since the proposed boundary of HSKEPP is currently located within private land lots with numerous existing private structures, the area accessible for ground investigation works is limited. As such, the technical feasibility of different foundation options should be further reviewed at a later project stage when more ground information can be gathered.

*Light-duty Structures*

2.4.3.3 Piling foundation and shallow foundation are both feasible foundation options for light-duty structures in HSKEPP. In order to minimize the disturbance to adjacent environment in terms of noise and vibration, shallow foundation is adopted for light-duty structure to reduce the environmental impact of the Project during construction stage.

*Heavy-duty Structures*

2.4.3.4 Based on the existing drilling record of ground investigation work, it is considered that both percussive pile and bored pile are feasible foundation options for heavy-duty structures within HSKEPP. However, since the stiffness of underground soil is undesirable for percussive pile, it is not the preferable option due to anticipated long pile length leading to

low economic efficiency. Meanwhile, the tentative bed rock level is at about 30m below ground level which allows the adoption of pre-bored socketed steel H piles for heavy-duty buildings. Therefore, subject to the detailed design of HSKEPP, bored pile would be the perferrable foundation option for those heavy structures in HSKEPP.

2.4.3.5 In addition, since the construction site of HSKEPP is located adjacent to the Kong Sham Western Highway and Road 42755 (the road under Kong Sham Western Highway), the vibration and noise induced by percussive piling is not desirable which may affect the adjacent road traffic. Thus, pre-bored socketed steel H pile remains the preferrable foundation option for heavy-duty structures in HSKEPP since it would generate less vibration and disturbance to the adjacent area. However, it should also be noted that pre-bored socketed steel H pile has its demerits of requiring a comparatively longer construction period as well as generating much larger volume of excavated materials to be disposed which would generate other environmental impacts.

## 2.5 Construction Programme

2.5.1.1 The Project construction works are anticipated to commence in early 2027 with completion of the Project by 2031.

# 3 KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

## 3.1 Air Quality Impact

3.1.1.1 The potential air quality impacts from the construction works of the HSKEPP would mainly be related to the construction dust from the demolition of the existing SWPTW and construction of superstructures and substructures (e.g. excavation, pilling, internal roadworks). With the implementation of mitigation measures specified in the Air Pollution Control (Construction Dust) Regulation, good site practices, and EM&A programme, no adverse dust impact at ASRs is anticipated due to the construction activities of the Project.

3.1.1.2 Flue gas emission would be emitted from the stacks of CHP and boiler in the HSKEPP. Cumulative air quality impact arising from the vehicular emissions from the open roads and other industrial emissions within the 500m assessment area has also been assessed in the assessment. The assessment results conclude that the predicted cumulative the 19$^{th}$ highest 1-hour and annual average $NO_2$, the 4$^{th}$ highest 10-min and the 4$^{th}$ highest daily average $SO_2$, the 10$^{th}$ highest daily and annual average RSP, the 19$^{th}$ highest daily (the number of allowable exceedance for Government Projects) and annual average FSP concentrations at representative ASRs would comply with the AQOs. No adverse air quality impact would be anticipated arising from the flue gas emission associated with the operation of HSKEPP.

3.1.1.3 All odour sources from sewage treatment facilities and food waste/sewage sludge anaerobic co-digestion facilities in HSKEPP would be fully enclosed. The potential odour emission from these facilities would all be treated in the deodourizers before discharge into atmosphere. With implementation of effective deodourizers, the assessment results showed that the predicted cumulative 5-second average odour concentration at the representative ASRs within the Study Area would comply with the criterion in EIAO-TM. No adverse odour impact on identified ASRs would be anticipated during the operation stage of proposed HSKEPP.

## 3.2 Noise Impact

3.2.1.1 The assessment for the potential construction noise impact from construction of the proposed HSKEPP has been conducted. No existing/planned NSR was identified within the 300m assessment boundary. No adverse construction noise impact due to the construction of HSKEPP would be anticipated.

3.2.1.2 The assessment for the potential fixed noise sources impact from operation of the proposed HSKEPP has been conducted. No existing/planned NSR was identified within the 300m assessment boundary. No adverse operation phase fixed noise sources impact due to the operation of HSKEPP would be anticipated.

## 3.3 Water Quality Impact

3.3.1.1 Minor water quality impact would be associated with land-based construction works. Water quality impact may result from wastewater generated from the general construction activities, construction site runoff, construction works near inland watercourses, sewage effluent from workforce and accidental chemical spillage. The potential impact could be mitigated and controlled by implementing the recommended mitigation measures. No adverse water quality impact from construction works for the HSKEPP would be anticipated.

3.3.1.2 Mathematical modelling was conducted under this EIA to study the water quality impacts caused by the potential change in the effluent flow and qualities from the proposed HSKEPP. The model results indicated that the proposed HSKEPP would not impose adverse water quality impact into the North Western and North Western Supplementary WCZ. The model results showed that the predicted salinity levels at WSRs in North Western and North Western Supplementary WCZs would comply with the WQO of no more than 10% change from the background levels. No unacceptable water quality impact from

normal operation of the proposed HSKEPP upon the receiving marine water would therefore be expected.

3.3.1.3 During the NWNT tunnel maintenance, it is unavoidable to result in worsen water quality (DO, BOD, TIN, UIA, SS and *E. coli*) due to increase of pollution loading discharging into the Deep Bay WCZ. In order to minimize the water quality impact, it is recommended under this Project to schedule the NWNT tunnel maintenance during dry season (November to March). The water quality model predicted that the pollution elevation in Deep Bay WCZ and the associated water quality recovery period would be significantly reduced and minimized for the HSKEPP maintenance discharge during dry season. An event and action plan and a water quality monitoring programme (as presented in the standalone EM&A Manual) is also proposed for the NWNT tunnel maintenance events during both construction and operational phases to minimize the water quality impacts.

3.3.1.4 For emergency discharge, the model results indicated that elevated levels of key water quality parameters would be recovered within 0.5-2.0 days after termination of the emergency discharge for Water Sensitive Receivers within Inner Deep Bay. The more distant WSR i.e. Oyster Culture Area was found not to be affected by emergency discharge event. The occurrence of emergency discharge from the proposed HSKEPP can be minimised by the implementation of appropriate mitigation measures, including dual power supply and provision of standby facilities. An Emergency Response Plan will be formulated prior to commissioning of HSKEPP to minimize the impact of emergency discharges and facilitate subsequent management of the emergency.

3.3.1.5 Other water quality impacts associated with the operation phase are identified as surface runoff from paved areas and accidental spillage. It is expected that these potential impacts can be prevented by adopting recommended mitigation measures. No unacceptable residual water quality impact would be expected.

## 3.4 Waste Management Implication

3.4.1.1 Waste management implications associated with the construction and operation of the Project were identified and assessed. Waste types generated by the construction activities of the Project would include construction and demolition (C&D) materials (from excavation works, foundation / construction works and demolition of existing structures/ buildings within SWPTW), general refuse (from construction workforce) and chemical waste (from maintenance of construction plant and equipment, as well as building demolition). Provided that these wastes are handled, transported and reused/disposed of using approved methods and that the recommended good site practices are strictly followed, adverse environmental impacts during construction phase would not be anticipated.

3.4.1.2 Reduction measures have been recommended to minimise the amount of C&D materials generated in the Project. Approximately 324,000 $m^3$ of inert C&D materials and 32,000 $m^3$ of non-inert C&D materials would be generated during the construction phase of the Project. 74,800 $m^3$ of inert C&D material would be reused on site while the remaining 249,200 $m^3$ of surplus inert C&D material would be recycled or transported to Public Fill Reception Facilities for beneficial reuse in other projects. Non-inert C&D waste would be recycled as far as possible before disposed to landfill. Opportunities in minimisation of generation and maximisation of reuse would be continually investigated during the detailed design and construction phases. The other materials that cannot be reused or recycled would be disposed to designated outlets (e.g. Chemical Waste Treatment Centre, landfills).

3.4.1.3 During operation, the main waste types to be generated would be grit and screenings, dewatered sludge, chemical waste and general refuse. The grit and screenings would be compacted and properly stored in a covered container prior to disposal at landfill on a daily basis. The transportation and disposal of the grit and screenings would be managed and controlled by a reputable waste collector. The dewatered sludge would be disposed of to the Sludge Treatment Facility (STF). Provided that proper handling procedures and disposal method are adopted, adverse environmental impacts would not be anticipated during the operation phase.

## 3.5 Land Contamination

3.5.1.1 A site appraisal, including the review of the HSK NDA EIA Study, desktop review and site walkover, was conducted from August 2020 to September 2021 to identify any potentially contaminating land uses within the proposed HSKEPP site. Based on the site appraisal findings, 4 facilities / areas with land contamination concern within the northern portion of HSKEPP (existing SWPTW) and 6 potentially contaminated sites within the southern portion of HSKEPP were identified.

3.5.1.2 Similar to the HSK NDA EIA Study, the identified concerned areas were inaccessible for detailed site walkover or SI works and still in operation. In addition, there might be change in land use prior to development which could result in further land contamination issues. Therefore, site re-appraisal should be conducted for the identified concerned areas prior to development of the sites in order to update findings of the site appraisal (e.g. locations of hotspots) and the sampling and testing requirements for SI works. In addition, re-appraisal would be required for the other remaining areas of the proposed HSKEPP site in order to assess the latest land uses and site conditions. The further works including site re-appraisal for the whole proposed HSKEPP site, associated SI works, any necessary remediation works and submission of supplementary Contamination Assessment Plan / Contamination Assessment Report / Remediation Action Plan / Remediation Report are recommended to be carried out prior to commencement of any construction or development works, and would follow the relevant Guidance Manual, Guidance Note and Practice Guide.

3.5.1.3 With the implementation of the recommended further works for the Project, any soil / groundwater contamination would be identified and properly treated prior to the construction works. No insurmountable land contamination impacts to the Project are therefore anticipated.

## 3.6 Ecology (Terrestrial and Aquatic)

3.6.1.1 A literature review and ecological field surveys have been conducted. A total of thirteen habitat types, including developed area/wasteland, plantation, grassland/shrubland, shrubland, mixed woodland, woodland, orchard, dry agricultural land, wet agricultural land, marsh, pond, modified watercourse and natural watercourse were recorded within the 500 m assessment area from recent surveys, with developed area/wasteland, and a small area and section of shrubland, dry agricultural land and modified watercourse recorded within the Project site. The ecological values of habitats within the Project site are very low and low, as they are highly modified and disturbed habitats which support limited flora and fauna. Similarly, due to the extent of existing development in the area, most of the other habitats recorded within the assessment area are of low ecological value, with the exception of the shrubland and mixed woodland on the terrain of Yuen Tau Shan, which are considered to be of low to moderate ecological value. In general, the assessment area supported limited wildlife, most wildlife were observed within the agricultural land-pond-marsh matrix to the west of KSWH.

3.6.1.2 No potential direct impact on recognised sites of conservation importance and natural habitats is expected to arise from the Project as all site formation works would be completed under a separate agreement for HSK/HT NDA, prior to the commencement of construction works for this Project. Indirect impacts, in the form of construction disturbance and water quality deterioration, are anticipated, though the ecological impact from these indirect impacts is expected to be minor and low, and no mitigation measures are required. Precautionary measures and enhancement opportunities to further minimize any potential environmental impacts and promote the ecological value of the Project are recommended. No adverse residual indirect impacts are expected arising from the Project.

3.6.1.3 Ecological monitoring and auditing are not required as no significant construction and operational phase ecological impact is anticipated; nor is any residual ecological impact.

## 3.7 Landscape and Visual Impact

3.7.1.1 Landscape and visual impacts assessment has been assessed in accordance with the criteria and guidelines as stated in Annexes 10 and 18 of the EIAO-TM and the Environmental Impact Assessment Ordinance (EIAO) Guidance Note No. 8/2010 on "Preparation of Landscape and Visual Impact Assessment under the Environmental Impact Assessment Ordinance", as well as Section 3.4.9 and Appendix G of the EIA study brief.

3.7.1.2 The Project will inevitably result in some landscape and visual impacts during construction and operation phases. These impacts have been minimized through minimization of works areas, and incorporation of sensitive and aesthetically pleasing design of aboveground structures and appropriate landscape and visual treatments for the project.

Landscape Impacts

3.7.1.3 Within the assessment area, 13 Landscape Resources (LRs) and 4 Landscape Character Areas (LCAs) are identified.

3.7.1.4 Based on the broad-brush tree survey, approximately 224 nos. of trees were surveyed within the project site boundary. A total of 224 trees in 4 tree groups (no trees of particular interests and potential tree of particular interest) within the project boundary and would be potentially affected were surveyed. There is no OVT in accordance with DEVB TC(W) No. 5/2020 identified within the project boundary. The dominant tree species include *Acacia confusa*, *Artocarpus heterohpyllus*, *Celtis sinensis*, *Dimocarpus longan*, *Ficus benjamina*, *Ficus hispida*, *Leucaena leucocephala*, *Litchi chinensis, Schefflera heptaphylla, Mangifera indica* and *Macaranga tanarius* . They are generally of heavy-standard to mature size. All tree species in tree groups surveyed are common in Hong Kong and without specific conservation interest, in which 89 nos. of the surveyed trees are undesirable tree species *Leucaena leucocephala*.

3.7.1.5 Under the proposed scheme for the Project, opportunities for tree compensation within the Project boundary has been fully explored and incorporated in the proposed mitigation measures as much as practicable. Within the project boundary, a minimum of 250 heavy standard trees will be proposed on-site and along roadside flat areas as compensatory tree planting. Mix of native tree species will be proposed with reference to Guiding Principles on Use of Native Plant Species in Public Works Projects promulgated by DEVB to improve the vegetation diversity, enhance ecological value and re-creation of vegetation habitat particular for areas adjoining the hillside area.

Visual Impacts

3.7.1.6 There are 7 types of Key Visually Sensitive Receiver (VSR) types identified in the Visual Envelopes of the Project, which are Residential VSRs, Recreational VSRs, Religious VSR, Occupational VSR, Travelling VSR, Planned Recreational VSR and Planned Occupational VSR.

3.7.1.7 Appropriate landscape and visual mitigation measures are proposed during construction phase, including preservation of existing vegetation, minimize disturbance on watercourses, management of construction activities and facilities, reinstatement of temporarily disturbed landscape areas, control of night-time lighting glare and erection of decorative screen hoarding, and during operation phase, including compensatory tree planting for loss of existing trees, roadside and amenity planting, sensitive and aesthetically pleasing design of aboveground structures, provision of buffer planting, provision of green roof and control of night-time lighting glare, to alleviate the potential impacts. Regarding mitigated visual impact, it is predicted that there would be slight to moderate residual impact on all the VSRs during construction, and would be insubstantial to moderate on day 1 of operation and be further reduced to insubstantial to slight when the proposed tree planting becomes mature in year 10 of operation.

3.7.1.8 As a whole, the residual landscape and visual impacts of the proposed Project is considered acceptable with the proposed mitigation measures implemented during construction and operation phases.

## 3.8 Hazard to Life

3.8.1.1 A quantitative hazard assessment was conducted to evaluate the biogas risk to existing, committed and planned off-site population due to operation of the food waste/sewage sludge anaerobic co-digestion facility at the proposed HSKEPP. Both the individual and societal risk levels were found to meet relevant requirements stipulated in the HKRG, i.e. the off-site individual risk level is far below $1\times10^{-5}$ per year and the societal risk falls into the “Acceptable” region. No mitigation measure is required. Therefore, the biogas risk associated with the operation of the proposed HSKEPP is considered acceptable.

# 4 ENVIRONMENTAL MONITORING AND AUDIT (EM&A)

4.1.1.1 Environmental Monitoring and Audit (EM&A) requirements for air quality, noise, water quality, waste management, land contamination, and landscape and visual impacts as well as hazard to life have been recommended, with regular site inspection and audits during construction phase to ensure that the recommended mitigation measures are properly implemented. The environmental monitoring to be conducted include construction dust monitoring during construction, commissioning test at the exhaust of CHP and boiler, odour monitoring at the inlet and outlet of deodourizing unit, odour patrol during regular and ad hoc maintenance or cleaning of the deodouring unit, water monitoring during construction and operation phases. The EM&A requirements are specified and detailed in the EM&A Manual.

# 5 CONCLUSION

5.1.1.1 The findings of the EIA provided information on the nature and extent of the environmental impacts likely to arise from the construction and operation of the Project. The EIA has, where appropriate, identified mitigation measures to ensure compliance with environmental legislation and standards.

5.1.1.2 Overall, the EIA concluded that the Project would comply with the requirements of the EIA Study Brief and EIAO-TM with the implementation of the proposed mitigation measures during construction and operational phases of the Project. The schedule of implementation of the proposed mitigation measures has been provided in the EIA Report. An EM&A programme has also been recommended to check the effectiveness of the proposed mitigation measures.