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## 16. ENVIRONMENTAL MONITORING AND AUDIT REQUIREMENTS

### 16.1 Introduction

- 16.1.1.1 This section elaborates the requirements of environmental monitoring and audit (EM&A) for the construction and operational phases of the Project, based on the assessment results of the various environmental issues.
- 16.1.1.2 The purpose of the EM&A programme is to ascertain and verify the assumptions implicit to, and accuracy of, EIA study predictions. The EM&A programme includes the scope of the EM&A requirements for the Project to ensure compliance with the EIA study recommendations, to assess the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action.
- 16.1.1.3 The following sections summarise the recommended EM&A requirements for this Project. Details of the requirements are provided in a stand-alone EM&A Manual.

### 16.2 Air Quality Impact

- 16.2.1.1 Dust monitoring and regular site audit should be conducted during construction phase so as to check compliance with the legislative requirements. Details of the monitoring and audit programme are contained in a stand-alone EM&A Manual.
- 16.2.1.2 Performance compliance tests are recommended for the deodourising units of planned EPP, to ensure the effectiveness of deodorisation treatment implemented in the Project. For the proposed FWPF, continuous monitoring of H<sub>2</sub>S and NH<sub>3</sub> concentrations and air flow at the exhaust outlet of the deodorization system are required after commissioning to ensure the actual odour emission rate not exceeding the emission limit adopted in the calculation shown in [Appendix 3.10](#). Separate EIA study would be conducted for the planned refuse transfer station (RTS) and the relevant EM&A requirements would be addressed in its individual EIA study. In addition, commissioning test should be conducted for the CHP units and the boiler to ensure proper operation of the facilities in the proposed EPP. As H<sub>2</sub>S is the major odour source associated with the EPP, it is recommended to conduct the odour monitoring in terms of hydrogen sulphide (H<sub>2</sub>S) at the deodorizers upon commissioning and in the first three years to determine whether it can meet the odour removal performance requirement. Upon the third-year monitoring, the odour monitoring should be reviewed and agreed with EPD if the monitoring is required to be continued.
- 16.2.1.3 In addition, Odour patrol is proposed to monitor the potential odour impact from the proposed EPP during the period of regular and ad hoc maintenance or cleaning of the deodorisation system. An Odour Complaint Registration System is also introduced in the EM&A programme to record information regarding the odour complaint and hence facilitates efficient investigation works.

### 16.3 Noise Impact

- 16.3.1.1 Noise monitoring is recommended as part of the environmental monitoring and audit (EM&A) programme for the construction phase of the Project to check compliance with the daytime construction noise criteria. Weekly site audit is also recommended to ensure the proper implementation of the recommended mitigation measures for daytime construction activities as part of the EM&A programme. Details of the EM&A requirements are provided in the EM&A Manual.
- 16.3.1.2 There would be no adverse traffic noise impact anticipated from Project contribution with the proposed mitigation measures in place. Cantilevered and vertical noise barriers are recommended on San Tin Highway and some proposed local distributor roads. Road traffic

noise levels should be monitored at representative existing NSRs, which are in the vicinity of the recommended direct mitigation measures, during the first year after road opening.

- 16.3.1.3 The assessment has indicated that the planned fixed plants at vehicle depot, planned police station, sport centres, Cultural & Recreational Complex, health facilities, GIC Complex, Information and Technology premises/data centre, electrical substation, DCS, logistic storage and warehouses, RCP, SPSs, Water Reclamation Plant, EPP and TIH within the Project would comply with the EIAO-TM standard if the design taking into account the proposed maximum allowable sound power levels. Monitoring of operation noise from these planned fixed plants during the testing and commissioning stage is recommended to verify the compliance with the EIAO-TM criteria. Separate EIA studies would be conducted for proposed RTS, the 400kV electricity substation and MTRC ventilation shafts, relevant EM&A requirements would be addressed in its individual EIA studies.

## 16.4 Water Quality Impact

- 16.4.1.1 With proper implementation of the recommended pollution control measures, water pollution from the Project would be avoided and minimised and no adverse water quality impacts would be expected during construction phase. Water quality monitoring during construction phase is proposed in the watercourses in the Project area including San Tin Eastern Main Drainage Channel (STEMDC) and its tributaries, San Tin Western Main Drainage Channel (STWMDC) and its tributaries, Shenzhen River, Lok Ma Chau Meander, small watercourses at Sam Po Shue, Lin Barn Tsuen, and along Sam Tam Road. In addition, weekly site audit should be undertaken during the construction phase to ensure the recommended pollution control measures are properly implemented. A WPCO license should be obtained if there has construction drainage discharge, and the discharge shall be in accordance with the WPCO license.

- 16.4.1.2 Water quality monitoring is recommended for the first year of the normal operation of proposed EPP. The treated effluent quality from the proposed EPP shall comply with tertiary treatment level. Follow-up water quality monitoring exercise shall be conducted after each emergency discharge to monitor the recovery of water quality in the vicinity. Monitoring of the treated effluent quality will be governed by the WPCO license to ensure that the effluent quality would comply with the design standards. Detailed environmental monitoring procedures are provided in the standalone EM&A manual.

- 16.4.1.3 Water quality monitoring for the Project can be divided into the following stages:

- Water quality monitoring during construction phase;
- Water quality monitoring during the first year operation of the proposed STLMC EPP;
- Follow-up water quality monitoring after each emergency discharge.

## 16.5 Waste Management Implications

- 16.5.1.1 Waste management would be the Contractor's responsibility to ensure that all wastes produced during the construction of the Project are handled, stored and disposed of in accordance with good waste management practices and EPD's regulations and requirements. The recommended mitigation measures should form the basis of the site WMP to be developed by the Contractors as part of the Environmental Management Plan in accordance with ETWB TC(W) No. 19/2005 *Environmental Management on Construction Sites* and submitted to the Engineer for approval at the construction stage. A trip ticket system in accordance with DEVB TCW No. 6/2010 should be in place. The monitoring and auditing requirement stated in ETWB TCW No.19/2005 and DEVB TCW No. 6/2010 should be followed with regard to the management of C&D materials.

- 16.5.1.2 Monthly site audit should be conducted by the Environmental Team (ET) during construction phase if wastes are being managed in accordance with approved procedures. The audits should look at all aspects of on-site waste management practices including waste generation, storage, recycling, transport and disposal. Apart from site inspections,

documents including licenses, permits, disposal and recycling records should be reviewed and audited for compliance with the legislation of the recommended good site practice and other waste management mitigation measures.

## 16.6 Land Contamination

- 16.6.1.1 Remediation works, if necessary, would be carried out based on the recommended further works outlined in Section 8.8.3. Mitigation measures as recommended in the future EPD approved RAP should be implemented during the remediation works. The EM&A requirements should be carried out in the form of regular site inspection to ensure the recommended mitigation measures are properly implemented.

## 16.7 Landfill Gas

- 16.7.1.1 Monitoring for landfill gases shall be conducted during operation phases of the Project. Where applicable, pre-entry monitoring following the requirements of the Factories and Industrial Undertaking (Confined Spaces) Regulation is recommended. The monitoring programme and detailed actions should be submitted to EPD for approval in the detailed design stage. The proposed parameters, locations and frequency of landfill gas monitoring for various phases of Project are detailed in the EM&A Manual.

## 16.8 Ecology (Terrestrial and Aquatic)

- 16.8.1.1 Key mitigation measures on specific ecological resources were recommended under **Section 10** of this EIA Report, which include wetland compensation, mitigation for egrettries, mitigation for night roosts, inclusion of flight corridor, woodland compensation, transplantation / translocation / nest control of species of conservation importance, and establishment of wildlife corridor. These measures should be monitored and audited by local ecologist(s) with relevant experience throughout the construction phase and during the operation phase to ensure proper implementation and, where appropriate, to monitor the performance of the proposed mitigation measures (e.g. monitoring upon the establishment of compensation areas may extend into operation phase). Furthermore, monthly site audit should be carried out throughout the construction phase to ensure recommended avoidance, minimisation, and pollution control measures are properly implemented. In case of non-compliance, contractor should be informed to strengthen the proposed measures accordingly. Details of EM&A requirements are discussed in the standalone EM&A Manual.

### Wetland Compensation

#### *Monitoring on Construction Phase Disturbance*

- 16.8.1.2 During the construction phase of the Project, ecological monitoring should be conducted to monitor the ecological disturbance arising from the construction activities under the Project, to verify the assumption adopted under the ecological assessment, including the assumption of Exclusion Zone (EZ) and Reduced Density Zone (RDZ). In turn, the effectiveness of the proposed minimisation measures should also be reviewed under part of the ecological monitoring on construction phase disturbance. Where necessary, the need for further or more effective mitigation measures shall be considered. The target indicator waterbird species that were adopted during formulation of mitigation measures (refer to **Section 10**) shall be focused during ecological monitoring. Details of construction disturbance monitoring (e.g. monitoring period, location, frequency, and parameters) are provided in the standalone **EM&A Manual**.

#### *Monitoring on Wetland Enhancement*

- 16.8.1.3 Enhanced wetland of 288 ha in the proposed SPS WCP would be established as a mitigation measure for the unavoidable loss of wetland habitats under the Project. The implementation details of the enhanced wetland, the associated management and

monitoring requirements (e.g. monitoring location, frequency and parameters) would be provided in a subsequent “Habitat Creation and Management Plan” (HCMP) and subject to detailed design. The HCMP should be submitted for approval from relevant Government departments (including AFCD and EPD), at least three months before the commencement of pond filling works.

- 16.8.1.4 A working group will be formed between CEDD (as San Tin Technopole’s works agent) and AFCD (as SPS WCP’s sponsoring department) to coordinate the progress of pond filling and SPS WCP implementation. With the coordination of the working group, ecological monitoring will be conducted to monitor the effectiveness of the proposed mitigation measures (i.e., ecological function enhancement measures). For example, the abundance and/or density of target indicator waterbird species shall be monitored. The standalone **EM&A Manual** further outlines the requirement and details to be included in the HCMP (e.g. monitoring period, location, frequency, parameters, and target levels).
- 16.8.1.5 The working group shall consult and regularly report to relevant stakeholders. Further enhancement measures shall be conducted under the coordination of the working group, where necessary, such as when the proposed ecological function enhancement measures show lower abundance and/or density of target indicator waterbird species than the mitigation target. Follow-up actions shall be investigated and implemented in liaison with the working group, where necessary. The follow-up actions associated with the ecological monitoring shall be provided in detail in the subsequent HCMP. The HCMP should be submitted for approval from relevant Government departments (including AFCD and EPD), at least three months before the commencement of pond filling works.

#### Egretty Monitoring

##### *Pre-construction Egretty Survey*

- 16.8.1.6 Two egrettries (MPLV Egretty and MPV Egretty) were recorded within / adjacent to Project boundary during recent ecological survey (2022) and buffer area(s) of 100 m from the footprint of both egrettries were proposed (**Figure 10.11** refers). Pre-construction surveys are necessary to confirm the latest boundary of the egrettries before commencement of the construction works, and the 100 m buffer area should be verified according to the latest site observation on the egrettries. The Pre-Construction Egretty Survey shall be conducted once per month during breeding season (between March and September) by qualified ecologist with 5 years relevant experience. A Pre-Construction Egretty Survey Report should be submitted to relevant Government departments (including AFCD and EPD) for approval no later than two months before the commencement of works within the buffer area. Details of the Pre-Construction Egretty Survey and the requirement of the subsequent Pre-Construction Egretty Survey Report are provided in the standalone **EM&A Manual**.
- 16.8.1.7 An “Open Space” with enhancement features was proposed to preserve the MPLV Egretty. Upon the Pre-construction Egretty Survey, an Egretty Habitat Enhancement and Management Plan including the details of design plan, site preparation works, works schedule and management plan should be prepared by qualified ecologist with relevant experience and submitted to relevant Government departments (including AFCD and EPD) for approval no later than two months before the commencement of works within the buffer area.

##### *Egretty Monitoring Survey*

- 16.8.1.8 During construction phase, egretty monitoring survey should be conducted monthly for both MPLV Egretty and MPV Egretty during breeding season (between March and early September). Upon the completion of enhancement work at the “Open Space”, egretty monitoring survey should be conducted monthly for the first three breeding seasons (between March and early September, for three years) of the operation phase. The monitoring survey should be conducted by qualified ecologist with 5 years relevant experience. The monitoring results should be reported in the monthly EM&A Reports. A

further Method Statement on construction activities near the egrettries and necessary tree crown pruning works shall be submitted to AFCD for approval in advance of the works.

#### *Night Roost Monitoring*

##### *Pre-construction Night Roost Survey*

- 16.8.1.9 Two night roosts (Ha Wan Tsuen Night Roost and San Tin Open Storage Area Night Roost) were identified within the Project boundary during recent ecological survey (2022) and encroachment into the footprint of night roosts is unavoidable (**Figures 10.6B to 10.6D** refer). As such, compensation measure via the re-provision of roosting substratum have been proposed for both night roosts, to be located within the Project area.
- 16.8.1.10 Pre-construction surveys are necessary to confirm the latest boundary and details of the night roosts, as well as the 100 m buffer area before commencement of the construction works. The pre-construction survey shall be conducted once per month between September and March by qualified ecologist with 5 years relevant experience. A Pre-construction Night Roost Survey Report should be submitted to relevant Government departments (including AFCD and EPD) for approval no later than two months before the commencement of works within the buffer area. Details of the Pre-construction Night Roost Survey and the requirement of the subsequent Pre-construction Night Roost Survey Report are provided in the standalone **EM&A Manual**.

#### *Night Roost Monitoring*

- 16.8.1.11 While roosting substratum at the two night roosts would be felled during construction phase, re-provision of roosting substratum at the proposed Fisheries Research Centre (**Figures 10.6C and 10.6D** refer) and along STWMDC (**Figure 10.6B** refers) would be completed before dry season, prior to the arrival of the overwintering ardeid and Great Cormorant. Felling of trees at both night roosts should only be conducted in wet season (April – September) when no roosting individuals are expected.
- 16.8.1.12 Night roost monitoring survey should be conducted at the original roosting sites until commencement of tree felling works, and upon re-provision of roosting substratum, conducted in the night roost re-provision sites and nearby area to investigate the effect of night roost re-provision site and confirm the locations of roosting ardeid and Great Cormorant, if any. Upon the successful establishment of the re-provided night roosts, a similar buffer area of 100 m should also be implemented at the footprint of the re-provided night roosts, where noisy construction activities should be subject to timing control. Details of the Night Roost Monitoring Survey, and the requirement for the monthly EM&A Reports (e.g. presentation of monitoring results and evaluation of the usage of the night roosts) are provided in the standalone **EM&A Manual**.

#### *Flight Corridor Monitoring*

##### *Monitoring of Avifauna usage across the Proposed 300m wide Flight Corridor*

- 16.8.1.13 A 300 m wide flight corridor across the LMC BCP would be retained under the Revised RODP, while noisy construction activities (with the use of PME) within this flight corridor would also be subject to timing control during dry season (October to March). Given the potential importance of this flight corridor, its bird usage should be monitored to ensure no adverse impacts arises from construction activities. Construction phase monitoring should be conducted, focusing on the composition of bird species and their abundance using the flight corridor, observed from suitable vantage point(s) such as the LMC Lookout. The flight line monitoring survey should be conducted during hours of peak usage (e.g. before sunrise) and conducted monthly when construction activities occur within this flight corridor. Details of the flight line monitoring, and the requirement for further minimisation measures are detailed in the standalone **EM&A Manual**.

Woodland Compensation Monitoring

- 16.8.1.14 For the unavoidable loss of woodland arising from the Project, compensatory planting was proposed as a mitigation measure, while the proposed location(s) and detailed design is subject to further agreement. A detailed Woodland Compensation Plan should be prepared by local ecologist / botanist with at least 5 years relevant experience to form the basis of the proposed compensatory planting. The Woodland Compensation Plan should include implementation details, management requirement, and monitoring requirements (e.g., methodology, schedule, frequency of monitoring, and monitoring parameters) of the compensatory planting area. The Woodland Compensation Plan should be submitted to relevant Government departments (including AFCD and EPD) for approval at least two months before commencement of planting.
- 16.8.1.15 Upon the completion of compensatory planting, a three-year monitoring by local ecologist / botanist with at least 5 years relevant experience is recommended to ensure proper establishment of this compensatory woodland. The associated monitoring and maintenance works (e.g., irrigation, weeding, pruning, control of pests and diseases, replacement planting and repair of damage) should be implemented and regularly performed, where required. Requirement of the Woodland Compensation Plan, and the subsequent woodland monitoring are provided in the standalone **EM&A Manual**.

Transplantation / Seedling Planting of Flora Species of Conservation Importance

- 16.8.1.16 All flora species of conservation importance (e.g. Cycad-fern *Brainea insignis*, Incense Tree *Aquilaria sinensis*, and Luofushan Joint-fir *Gnetum luofuense*) should be protected as far as practicable. As a mitigation measure, all the unavoidably affected individuals of Incense Tree and Cycad Fern should be preserved on site, or transplanted to nearby suitable habitat(s) prior to the commencement of site clearance as a last resort. Seedling planting of Luofushan Joint-fir in nearby suitable habitat(s) prior to the commencement of site clearance is recommended if on-site preservation is not feasible. A detailed Pre-construction Vegetation Survey should be conducted by a suitably qualified botanist / ecologist with at least 5 years relevant experience to identify and record the affected individuals prior to the commencement of any site clearance works. A Protection and Transplantation / Seedling Planting Proposal including the subsequent monitoring visit for the affected individuals should be prepared and conducted by a suitably qualified ecologist / botanist with at least 5 years relevant experience. The Proposal should be submitted for approval from relevant Government departments (including AFCD and EPD) at least two months before works commencement.
- 16.8.1.17 Upon the transplantation / seedling planting of the identified individuals, a post-transplantation / post-seedling planting monitoring should be implemented to monitor the health conditions and survival of the transplanted individuals. Details of post-transplantation monitoring are provided in the standalone **EM&A Manual**.

Translocation of Fauna Species of Conservation Importance

- 16.8.1.18 Fauna species of conservation importance with low mobility should also be preserved as far as practicable, including two amphibian species Chinese Bullfrog and Spotted Narrow-mouthed Frog, one freshwater fish species Rose Bitterling (with the symbiotic freshwater Chinese Pond Mussel for the fish species, and two freshwater crab species *Cryptopotamon anacoluthon* and *Somanniathelphusa zanklon*). The species should be translocated to nearby suitable habitat(s) prior to the commencement of site clearance, while preliminary receptor sites are suggested in **Section 10.11**. A detailed pre-construction survey should be conducted by a suitably qualified ecologist to identify and record the affected individuals prior to the commencement of any site clearance works. A Translocation Proposal including the subsequent monitoring visits for the affected individuals should be prepared and conducted by a suitably qualified ecologist with at least 5 years relevant experience. The Proposal should be submitted for approval from relevant Government departments (including AFCD and EPD) at least two months before works commencement.

- 16.8.1.19 Upon the translocation of the identified individuals, a three-year post-translocation monitoring should be implemented to investigate the survival of translocated individuals as best as possible. Details of post-translocation monitoring are provided in the standalone **EM&A Manual**.

Pre-Construction Site Check and Nest Control

- 16.8.1.20 Breeding / nesting behaviour of Little Ringed Plover, White-shouldered Starling and White-throated Kingfisher were recorded within the Project Area during the survey period (2022). As a mitigation measure, nest control measures should be implemented to avoid direct injury / impact on breeding / nesting behaviour of the three avifauna species of conservation importance observed in Project area. Specific nest control measures for the species are discussed in **Section 10.11**. Pre-construction survey should be conducted in breeding season (March to July), with attention should be given to the specific breeding habitats of these species, to identify the locations and condition of the nest of these species within Project area. All breeding / nesting behaviour of any avifauna species of conservation importance identified and associated detailed nest control measures should be presented in the Pre-construction Survey Report, which shall be submitted for approval from relevant Government departments (including AFCD and EPD) no later than two months before commencement of work that involves the removal the breeding / nesting locations. The pre-construction survey and nest control measures should be conducted by qualified local ecologist with at least 10 years relevant experience to avoid injuring any breeding pairs, chicks and eggs. Details of pre-construction site check and nest control are provided in the standalone **EM&A Manual**.

Wildlife Corridor

- 16.8.1.21 Wildlife corridors are proposed in northern portion (between Ha Wan Tsuen and STEMDC, across LMC BCP) and in southern portion (near Shek Wu Wai Village, connecting future Green Belts) to minimize habitat fragmentation, while the detailed design of the wildlife corridor would be provided separately in design phase. To maintain the function of the wildlife corridor, monitoring of the wildlife corridor shall be conducted during the first three years upon establishment. The conditions of the constructed wildlife corridor (e.g. structural integrity, vegetation overgrown, any observable usage) shall be monitored bi-monthly, while any potential usage of the wildlife corridor by mammal species (e.g. Eurasian Otter and Small Indian Civet) should also be recorded (e.g. with the use of camera traps). Maintenance work such as weeding, screening, and repairing broken fencing / structure should be conducted by the Project Proponent and the Contractor, where necessary, during the period of monitoring of the wildlife corridor conditions.

Pre-Construction Site Check for Eurasian Otter

- 16.8.1.22 While no sightings for Eurasian Otter have been made from recent surveys and from regular monitoring by WWF and KFBG, the overall wetland habitat was suggested to historically support a small population of Eurasian Otters and provide ecological connection, as evidenced by the presence of scats (Mcmillan et al., 2023). Considering the elusive nature of this species, pre-construction site check(s) for this species shall be considered under a conservative approach. Pre-construction site check(s) for signs of otter usage (e.g. presence of scats, and in particular, presence of otter holts or dens) shall be conducted prior to the commencement of construction activities at the wetland habitats on the northern portion of the Project site (e.g., San Tin, Sam Po Shue, and Lok Ma Chau). Where signs of otters were observed from pre-construction site checks or during construction, construction activities in the area shall be ceased, and the need for further mitigation measures shall be considered in liaison with relevant departments (e.g., AFCD). Details of pre-construction site check for Eurasian Otters are provided further in the standalone **EM&A Manual**.

### Other Minimisation Measures

- 16.8.1.23 EM&A programmes were recommended to ensure compliance in regard of the potential air quality and noise impacts (e.g. potential dust emission during construction phase, and potential noise exceedance from construction noise). Monitoring requirements for construction dust emission and construction noise monitoring are further stated at **Section 16.2** and **Section 16.3** respectively. Regular site environmental audit during construction phase is also recommended to ensure proper implementation of mitigation measures and good site practices. Details of the EM&A programme are provided in a stand-alone EM&A Manual.
- 16.8.1.24 Water quality monitoring and regular site inspections would be undertaken during the construction to ensure that the recommended mitigation measures for water quality are properly implemented. Details on monitoring requirement for water quality is further stated in the **Section 16.4** and the stand-alone EM&A Manual.

## **16.9 Fisheries Impact**

- 16.9.1.1 With the implementation of mitigation and precautionary measures proposed in **Section 16.4**, potential water quality impacts arising from the Project would be minimised. No specific EM&A programme is required for the potential water quality impact in association with fisheries impact because the monitoring and audit requirement have been covered by the EM&A programme for potential water quality impact recommended in **Section 16.4**. The loss of fishpond (i.e. loss of aquaculture area), aquaculture activities and potential will also be compensated by the 40 ha of area in the proposed SPS WCP reserved solely for aquaculture, through measures described in **Section 11** (including incorporation of modernised aquaculture and the development of Fisheries Research Centre, etc.), while the location and detailed design would be subject to subsequent study. The implementation details of the fisheries enhancement area, the associated management, the supervision, and the maintenance works at the operation stage would be included during the detailed design. As the overall enhancement of fisheries resources brought about by the mitigation measures is qualitative in nature and non-measurable, no further specific monitoring and audit programme for fisheries resources would be necessary.

## **16.10 Cultural Heritage**

- 16.10.1.1 Three other identified items located within the Project area, including Tin Tak Heroes Temple (MPL01), Mai Po Lung Vegetable Marketing Co-operative Society Ltd. (MPL02) and Sun Tin Vegetable Marketing Co-operative Society Ltd. (SHT01), should be preserved by record if direct impact of demolition is imminent. A comprehensive record through 3D scanning, video recording and cartographic and photographic recording should be conducted by the project proponent of subsequent developer(s) prior to any construction works. A copy of these records should be provided to AMO for record purpose and future use, such as research, exhibition and educational programmes.
- 16.10.1.2 Monitoring of ground-borne vibration, tilting and ground settlement, shall be employed for Entrance Gate, Enclosing Walls and Shrine, Yan Shau Wai (HBN186) during the site formation and construction phases. The monitoring should be incorporated with a set of Alert, Alarm and Action (3As) system strictly following AMO's monitoring requirements for grade 3 historic building. The proposed 3As levels during construction phase are presented in **Table 12.5.6**.
- 16.10.1.3 The actual 3As criteria should be agreed with the AMO prior to the commencement of construction works. A monitoring proposal, including checkpoint locations, installation details, response actions to be taken when reaching each of the Alert/ Alarm/ Action (3As) levels and frequency of monitoring should be submitted to AMO and relevant stakeholder(s) for consideration before commencement of the works. Prior agreement and consent should be sought from the owner(s), stakeholder(s) and relevant Government department(s) for the installation of monitoring points on the built heritage before commencement of the

- works. Record of monitoring should be submitted regularly to AMO during the construction. AMO should be alerted in case any irregularities are observed.
- 16.10.1.4 Monitoring of ground-borne vibration, tilting and ground settlement is also proposed to be employed for Yeung Hau Temple (San Tin) (MPT01) and Structure between No. 5 and No. 7, Shek Wu Wai (SWW01) during the site formation and construction phases under Buildings Ordinance.
- 16.10.1.5 The monitoring should be incorporated with a set of Alert, Alarm and Action (3As) system strictly following the requirements set out in Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers - Ground-borne Vibrations and Ground Settlements Arising from Pile Driving and Similar Operations (PNAP APP-137) on vibration-sensitive and dilapidated buildings. If the alert level is exceeded, the monitoring frequency should be increased. If the alarm level is exceeded, the design of the construction may have to be amended. If the action level is exceeded, all works should be stopped. Empirical guidelines on the 3As criteria provided in PNAP APP-137 during construction phase are quoted in **Table 12.5.7**. The actual 3As criteria shall be further confirmed via an assessment on the effects of ground-borne vibrations, settlements and tilting on MPT01 and SWW01.
- 16.10.1.6 Prior agreement and consent should be sought from the owner(s), stakeholder(s) and relevant Government department(s) for the installation of monitoring points on the building before commencement of the works. Record of monitoring should be submitted regularly to the Buildings Department during the construction under Buildings Ordinance. Buildings Department should be alerted in case any irregularities are observed.
- 16.10.1.7 Seven other identified items may experience impacts of ground borne vibration, tilting and settlement, namely Gurkha Cemetery (BH03), Mans' Boundary Stone (BH06), Grave of Man Lun Fung ("麒麟吐玉書") (BH07), Grave of Man Chung Luen (BH08), Grave of Man Chu Shui (BH10), Grave of Mrs Man Leung (BH11) and Grave of Chong Yin Kei (BH12). With an aim to define the vibration limit and to evaluate if ground-borne vibration, tilting and ground settlement monitoring and structural strengthening measures are required during construction phase, a baseline condition survey and baseline vibration impact assessment should be conducted for these non-building structures by a qualified building surveyor or qualified structural engineer during pre-construction stage of the proposed developments. This is to ensure the construction performance meets with the vibration standard stated in the EIA report. Should monitoring of ground-borne vibration, tilting and ground settlement be required, the monitoring procedures shall refer to **Section 16.10.1.4** and **Section 16.10.1.5**.
- 16.10.1.8 The entrance door of Yeung Hau Temple (San Tin) (MPT01) leads directly to the Project boundary. A safe access route shall be maintained for visitors during the construction stage.
- 16.10.1.9 There would be a temporary change of access to Gurkha Cemetery (BH03), Grave of Man Lun Fung ("麒麟吐玉書") (BH07), Grave of Man Chung Luen (BH08), Grave of Man Chu Shui (BH10) and Grave of Mrs Man Leung (BH11) during the construction phase. A safe access route to these burial grounds should be maintained for conducting any mitigation measures, in particular during *Ching Ming Festival*, *Chung Yeung Festival* and *Purkha Divas*.
- 16.10.1.10 The contractors should enforce protocol to forbid any light machinery, such as handheld jackhammer, or heavy machinery to come into direct contact with Yeung Hau Temple (San Tin) (MPT01), which is located right next to the Project boundary. Physical protective barriers/ covers or intervention/cushioning materials, including but not limited to covering or sheltering, shall be provided during the proposed construction works to separate the works areas from the structure. No piling works shall be allowed within the protective zone. No worker or any construction related equipment(s) and material(s) should trespass the protective zone. The contractor should propose the actual extent of the protective zone

and suitable protective covering materials to the satisfaction of AMO prior to the commencement of the proposed construction works.

- 16.10.1.11 Implementation of mitigation measures in the *Air Pollution Control (Construction Dust) Regulation*, dust suppression measures and good site practice should be observed by the project proponent during the construction phase in order to avoid dust accumulation on the Yeung Hau Temple (San Tin) (MPT01) and Grave of Chong Yin Kei (BH12).
- 16.10.1.12 For archaeology, archaeological watching brief is recommended to be carried out in two archaeologically sensitive areas (ASA), namely Shek Wu Wai ASA and Mai Po Lung (South) ASA, should works involve soil disturbance occurred (such as site formation) during the construction phase. The objective of the Archaeological Watching Brief is to ensure the protection and preservation of any potential archaeological deposits, particularly those from Song and Ming-Qing dynasties, that may exist within the Shek Wu Wai ASA and Mai Po Lung (South) ASA. The project proponent or future subsequent developer(s) should employ an archaeologist who must obtain a *Licence to Excavate and Search for Antiquities* from the Antiquities Authority prior the commencement of the fieldworks. The scope, methodology and programme of the archaeological survey shall be agreed with AMO.
- 16.10.1.13 Five archaeologically sensitive areas, namely Hop Shing Wai ASA, Mai Po ASA, Siu Hum Tsuen (West) ASA, Siu Hum Tsuen (East) ASA and Pang Loon Tei ASA, are either occupied privately as buildings, paved car parks and open storages or have their accessibility restricted by security measures such as fencing. These areas cannot be accessed, thus lack archaeological information from this survey. Further archaeological survey at later stages after land resumption but before site formation works is recommended. The survey shall be conducted by an archaeologist who must obtain a *Licence to Excavate and Search for Antiquities* from the Antiquities Authority prior the commencement of the fieldworks. The scope, methodology and programme of the archaeological survey shall be agreed with AMO.
- 16.10.1.14 In particular, Mai Po ASA includes Mai Po Site of Archaeological Interest, which holds significant archaeological potential. Previous archaeological discovery indicated the discovery of jars of coins dating back to the Song dynasty in this area. Given the exceptional nature of these archaeological findings, the objective of the archaeological survey should take into account the unique context of these discoveries. The survey team should thoroughly review the available finding reports to determine if any specific conditions regarding the burial of these jars of coins exist.
- 16.10.1.15 Opportunity to conduct archaeological fieldwork as soon as possible after land resumption would be considered by the Project Proponent.
- 16.10.1.16 The area of Mai Po Lung (North) ASA is reserved for an egretty (**Section 10** on Ecology of EIA report refers). No impact on archaeology is anticipated, no mitigation measure is required, subjected to the detailed design of this area. Should construction works involving soil disturbance are anticipated during the detailed design stage, project proponent should review the impact assessment and propose adequate mitigation measures to AMO for approval.
- 16.10.1.17 As a precautionary measure, if antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered, the project proponent is required to inform AMO immediately for discussion of appropriate mitigation measures to be agreed by AMO before implementation by the project proponent to the satisfaction of AMO.

## 16.11 Hazard to Life

- 16.11.1.1 Hazard assessments were conducted to assess the risks associated with operation of the proposed EPP, the HP Gas Pipeline, and the proposed GFSs during the construction and operation phases of the Project. The results showed that both the individual risks and

societal risks, taking into account the population induced by the Project, would be in compliance with the risk criteria stipulated. No EM&A programme is required.

## **16.12 Landscape and Visual Impact**

16.12.1.1 The EIA has recommended landscape and visual mitigation measures to be undertaken during construction and operation phases of the Project. The following paragraphs define the EM&A requirements to ensure the proposed landscape and visual impact mitigation measures are effectively implemented.

16.12.1.2 The construction phase EM&A of the landscape and visual environment and mitigation measures shall be carried out as part of the site audit programme. Specific EM&A during operation phase of the Project is not required as long as the proposed mitigation measures in the EIA and as depicted in the Landscape Mitigation Plan are fully implemented. Baseline changes with respect to the landscape and visual environments should be carried out in reference to the recorded baseline conditions of the site as described in Section 14.6 of the EIA report. The monitoring should in particular record changes of each landscape resource, landscape character area and the view conditions of each visually sensitive receiver. Parameters used to describe changes in each of the above should be the same as in Section 14.6 of the EIA report. The baseline monitoring should be conducted as a one-off site survey prior to commencement of any construction works. All mitigation measures proposed in the EIA and implemented by the Contractor should be audited by a landscape auditor, as a member of the Environmental Team, on a regular basis to ensure compliance with the intended aims of the measures. Site inspection should be undertaken at least once every two weeks throughout the construction period. In particular, the extent of the agreed works areas should be regularly checked during the construction phase. Any trespass by the contractor outside the limit of the works, including any damage to the existing trees, woodland and vegetation should be noted. The landscape auditor should audit the proposed mitigation measures in the EIA to ensure that they are fully implemented within the Project design and construction and the 12-month establishment period during operation phase.

## **16.13 Electric and Magnetic Fields**

16.13.1.1 Based on the assessment results, the exposure of the Public to the Electric field (ELF) and Magnetic field (EMF) generated from the overhead cables are far below the guideline limits issued by the ICNIRP. No specific EM&A programme is required.

## **16.14 Summary of EM&A Requirements for Schedule 2 Designated Projects Subject to Environmental Permit Application**

16.14.1.1 A summary of key EM&A requirements for Schedule 2 designated projects (DP) subject to EP application is provided in **Table 16.1**. Details are provided in the stand-alone EM&A Manual.

**Table 16.1 Summary of Key EM&A Requirements for Schedule 2 DPs Subject to EP Application under this Study**

Environmental Impact	Summary of EM&A Requirements
<b>DP 1 - Construction and operation of primary distributor road P1, district distributor road D1, D2, D3, D4, D5 and D6</b>	
Air Quality	<ul style="list-style-type: none"> <li>Construction dust monitoring and regular site audit during construction period</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Construction noise monitoring and regular site audit during construction period</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Regular site audit during construction phase</li> </ul>
Sewerage and Sewage Treatment Implications	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Waste Management Implications	<ul style="list-style-type: none"> <li>Regular audits and site inspections should be carried out during construction phase</li> </ul>
Land Contamination	<ul style="list-style-type: none"> <li>If the recommended further works confirm remediation works is required, regular site audit during construction phase is required to ensure the implementation of proposed mitigation measures effectively</li> </ul>
Landfill Gas	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Ecology	<ul style="list-style-type: none"> <li>Regular site audit should be carried out throughout the construction phase.</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Cultural Heritage	<ul style="list-style-type: none"> <li>A baseline condition survey and baseline vibration impact assessment should be conducted for the non-building structures located in close proximity by a qualified building surveyor or qualified structural engineer during pre-construction stage of the proposed developments. These non-building structures include Grave of Man Chung Luen and Grave of Mrs Man Leung.</li> <li>A safe access route to these burial grounds should be maintained for conducting any mitigation measures, in particular during Ching Ming Festival and Chung Yeung Festival.</li> <li>Archaeological Watching Brief is recommended to be carried out in Mai Po Lung (South) Archaeologically Sensitive Area (ASA) should works involve soil disturbance occurred (such as site formation) during the construction phase.</li> <li>Further archaeological survey at later stages after land resumption but before site formation works is recommended for Mai Po ASA and Pang Loon Tei ASA.</li> <li>If antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered, the project proponent is required to inform AMO immediately for discussion of appropriate mitigation measures to be agreed by AMO before implementation by the project proponent to the satisfaction of AMO.</li> </ul>
Hazard to Life	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>Landscape and visual monitoring during construction and 12-month establishment period during operation phase.</li> </ul>
<b>DP 2 - Construction and operation of STLMC Effluent Polishing Plant with co-digestion function</b>	
Air Quality	<ul style="list-style-type: none"> <li>Construction dust monitoring and regular site audit during construction period</li> <li>Odour monitoring (in term of H<sub>2</sub>S concentration) at inlets and outlets of each DO unit in the first three years upon operation of EPP</li> <li>Odour patrol during the period of regular and ad hoc maintenance or cleaning of the deodorization system of EPP</li> <li>Odour Complaint Registration System for EPP introduced in EM&amp;A Programme</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Construction noise monitoring and regular site audit during construction period</li> <li>Operation noise monitoring for fixed plants during the testing and commissioning stage</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Regular site audit during construction phase</li> <li>Water quality monitoring should be conducted for the first year of the normal operation of proposed EPP.</li> <li>Follow-up water quality monitoring exercise should be conducted after each emergency discharge to monitor the recovery of water quality in the vicinity</li> </ul>

Environmental Impact	Summary of EM&A Requirements
Sewerage and Sewage Treatment Implications	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Waste Management Implications	<ul style="list-style-type: none"> <li>Regular audits and site inspections should be carried out during construction phase</li> </ul>
Land Contamination	<ul style="list-style-type: none"> <li>If the recommended further works confirm remediation works is required, regular site audit during construction phase is required to ensure the implementation of proposed mitigation measures effectively</li> </ul>
Landfill Gas	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Ecology	<ul style="list-style-type: none"> <li>Regular site audit should be carried out throughout the construction phase</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Cultural Heritage	<ul style="list-style-type: none"> <li>Tin Tak Heroes Temple (MPL01) should be preserved by record if direct impact of demolition is imminent. A comprehensive record through 3D scanning, video recording and cartographic and photographic recording should be conducted by the project proponent of subsequent developer(s) prior to any construction works. A copy of these records should be provided to AMO for record purpose and future use, such as research, exhibition and educational programmes.</li> <li>Archaeological Watching Brief is recommended to be carried out in Mai Po Lung (South) Archaeologically Sensitive Area should works involve soil disturbance occurred (such as site formation) during the construction phase.</li> <li>Further archaeological survey at later stages after land resumption but before site formation works is recommended for Mai Po ASA.</li> <li>If antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered, the project proponent is required to inform AMO immediately for discussion of appropriate mitigation measures to be agreed by AMO before implementation by the project proponent to the satisfaction of AMO.</li> </ul>
Hazard to Life	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>Landscape and visual monitoring during construction and 12-month establishment period during operation phase</li> </ul>
<b>DP3 - Construction and operation of STLMC Water Reclamation Plant</b>	
Air Quality	<ul style="list-style-type: none"> <li>Construction dust monitoring and regular site audit during construction period</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Construction noise monitoring and regular site audit during construction period</li> <li>Operation noise monitoring for fixed plants during the testing and commissioning stage</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Regular site audit during construction phase</li> </ul>
Sewerage and Sewage Treatment Implications	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Waste Management Implications	<ul style="list-style-type: none"> <li>Regular audits and site inspections should be carried out during construction phase</li> </ul>
Land Contamination	<ul style="list-style-type: none"> <li>If the recommended further works confirm remediation works is required, regular site audit during construction phase is required to ensure the implementation of proposed mitigation measures effectively</li> </ul>
Landfill Gas	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Ecology	<ul style="list-style-type: none"> <li>Regular site audit should be carried out throughout the construction phase</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Cultural Heritage	<ul style="list-style-type: none"> <li>If antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered, the project proponent is required to inform AMO immediately for discussion of appropriate mitigation measures to be agreed by AMO before implementation by the project proponent to the satisfaction of AMO.</li> </ul>
Hazard to Life	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>Landscape and visual monitoring during construction and 12-month establishment period during operation phase</li> </ul>

Environmental Impact	Summary of EM&A Requirements
<b>DP 6 - Revitalisation works (i.e. river training, diversion works) for San Tin Eastern Main Drainage Channel are located less than 300m from Conservation Area<sup>1</sup></b>	
Air Quality	<ul style="list-style-type: none"> <li>Construction dust monitoring and regular site audit during construction period</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Construction noise monitoring and regular site audit during construction period</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Water quality monitoring and regular site audit during construction phase</li> </ul>
Sewerage and Sewage Treatment Implications	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Waste Management Implications	<ul style="list-style-type: none"> <li>Regular audits and site inspections should be carried out during construction phase</li> </ul>
Land Contamination	<ul style="list-style-type: none"> <li>If the recommended further works confirm remediation works is required, regular site audit during construction phase is required to ensure the implementation of proposed mitigation measures effectively</li> </ul>
Landfill Gas	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Ecology	<ul style="list-style-type: none"> <li>Regular site audit should be carried out throughout the construction phase</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Cultural Heritage	<ul style="list-style-type: none"> <li>If antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered, the project proponent is required to inform AMO immediately for discussion of appropriate mitigation measures to be agreed by AMO before implementation by the project proponent to the satisfaction of AMO.</li> </ul>
Hazard to Life	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Landscape and Visual	<ul style="list-style-type: none"> <li>Landscape and visual monitoring during construction and 12-month establishment period during operation phase</li> </ul>
<b>DP 7 - Recreational development for proposed Sites O.1.1, O.1.2, and O.1.3 (as open space) encroach into Deep Bay Buffer Zone 2</b>	
Air Quality	<ul style="list-style-type: none"> <li>Construction dust monitoring and regular site audit during construction period</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Construction noise monitoring and regular site audit during construction period</li> </ul>
Water Quality	<ul style="list-style-type: none"> <li>Water quality monitoring and regular site audit during construction phase</li> </ul>
Sewerage and Sewage Treatment Implications	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Waste Management Implications	<ul style="list-style-type: none"> <li>Regular audits and site inspections should be carried out during construction phase</li> </ul>
Land Contamination	<ul style="list-style-type: none"> <li>If the recommended further works confirm remediation works is required, regular site audit during construction phase is required to ensure the implementation of proposed mitigation measures effectively</li> </ul>
Landfill Gas	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Ecology	<ul style="list-style-type: none"> <li>Regular site audit should be carried out throughout the construction phase at O.1.3</li> <li>Encroachment into the core area of trees at MPLV egretry should be strictly avoided during the construction phase at O.1.3</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>N/A</li> </ul>
Cultural Heritage	<ul style="list-style-type: none"> <li>If antiquities or supposed antiquities under the Antiquities and Monuments Ordinance (Cap. 53) are discovered, the project proponent is required to inform AMO immediately for discussion of appropriate mitigation measures to be agreed by AMO before implementation by the project proponent to the satisfaction of AMO.</li> </ul>
Hazard to Life	<ul style="list-style-type: none"> <li>N/A</li> </ul>

<sup>1</sup> The future zonings of the concerned 'Conservation Area' as shown on **Figure 1.2** in this EIA Report are subject to change due to the land use proposals as reflected in the RODP.

<b>Environmental Impact</b>	<b>Summary of EM&amp;A Requirements</b>
Landscape and Visual	<ul style="list-style-type: none"><li>• Landscape and visual monitoring during construction and 12-month establishment period during operation phase</li></ul>