

## 9. CONCLUSION

### 9.1 Introduction

An assessment of the potential environmental impacts associated with the decommissioning/demolition, construction and operation phases of the Project at the LPS has been conducted in accordance with the requirements of the EIA Study Brief and *EIAO-TM*. This *Section* summarises the key environmental outcomes, potential environmental impacts and the recommended mitigation measures (where necessary) associated with the Project.

### 9.2 Summary of Environmental Outcomes

The EIA study predicted that the Project would be environmentally acceptable with the implementation of the recommended mitigation measures. The key environmental outcomes, taking into account the selection of environmentally friendly options on location, siting, alternative method of electricity generation accrued from the environmental considerations and analysis during the EIA study and the implementation of environmental control measures of the Project, are summarised in the following sections.

#### 9.2.1 Environmental Benefits of the Preferred Option

The existing units (i.e. GT2, GT3, GT4, GT57 and GT6) within the GT Compound have been in service since 1989 and are required to be retired as they approach the end of the service life. The operation of the aging units is increasingly less efficient and could potentially lead to higher air emissions. New OCGTs are much more efficient and capable of attaining a more stringent emission standards and thus producing lower air emissions during operation, in particular NO<sub>x</sub>, when generating the same amount of power as the existing OCGTs. Therefore, the Project is beneficial from an environmental perspective and can be considered as part of the ongoing effort of HK Electric to further reduce the overall air emissions from the operation of LPS and contribute to the long-term air quality improvement in Hong Kong.

#### 9.2.2 Environmentally Friendly Options Considered and Incorporated in the Preferred Option

Different alternative options have been explored to meet the requirement of providing the necessary electricity demand during peak-opping and emergency operations upon progressive retirement and decommissioning of the existing units within the GT Compound, having regard to various factors including project programme, technical feasibility and environmental considerations. The construction and operation of new OCGTs is considered the most practicable, and the preferred option to pursue as this involves like-to-like replacement, is fit for purpose, technically the most feasible, and can tie in with the retirement schedule of the existing units.

Existing GT Compound, L13 area and L3 Main Station Building within the LPS and LMX have been identified as potential sites for accommodating the new OCGTs. The development of the new OCGTs would require no foundation works and minimal civil works if the new units are to be installed at the GT Compound, while the same would require extensive foundation and civil works if they are installed at L13 area and/or L3 Main Station Building. Waste generation and other potential environmental impacts (e.g. air quality, noise) can be minimised with the development of the new OCGTs at the GT Compound. From an environmental perspective, it is therefore considered preferable to develop the new OCGTs at the GT Compound.

### 9.3 Summary of Environmental Impacts

The summaries of environmental impacts are structured as follows for each of the technical assessment completed under this EIA study:

- Sensitive receivers/ assessment points;
- Assessment Methodology and Criteria;
- Key Construction Impacts;
- Key Operation Impacts;
- Key Mitigation Measures;
- Residual Impacts; and
- Compliance with the guidelines and criteria of the *EIAO-TM*.

### 9.3.1 Air Quality

**Table 9.1** presents a summary of the key findings of the assessment of potential impacts to air quality as a result of the decommissioning/ demolition, construction and operation of the Project. Full details of the assessment and mitigation measures are presented in **Section 3** of this EIA Report.

**Table 9.1 Summary of Environmental Assessment and Outcomes – Air Quality**

| Item                                | Description  |
|-------------------------------------|--|
| Air Sensitive Receivers (ASRs)      | <p>The Assessment Area is defined as an area within 15km from the Project site boundary as stated in Section 3.4.3.3 of the EIA Study Brief. The Assessment Area includes:</p> <ul style="list-style-type: none"> <li>▪ The Islands (Lamma Island, Cheung Chau, Peng Chau, Hei Ling Chau, Northern and Eastern part of Lantau Island);</li> <li>▪ Southern District of Hong Kong Island;</li> <li>▪ Central and Western District of Hong Kong Island;</li> <li>▪ Eastern District of Hong Kong Island;</li> <li>▪ Kowloon; and</li> <li>▪ Tsing Yi.</li> </ul> <p>A total of 61 ASRs have been identified in accordance with the criteria in <i>EIAO-TM</i> Annex 12 and are illustrated in <b>Figure 3.1</b>.</p>   |
| Assessment Methodology and Criteria | <ul style="list-style-type: none"> <li>▪ The principal legislation for the management of air quality in Hong Kong is the <i>Air Pollution Control Ordinance (APCO) (Cap 311)</i>. As the new set of AQOs will be implemented on 1 January 2022, the new AQOs were used as the assessment criteria for this assessment.</li> <li>▪ A maximum hourly TSP level of 500 µg m<sup>-3</sup> at ASRs is also stipulated in Annex 4 of the <i>EIAO-TM</i> to assess potential construction dust impacts. The measures stipulated in the <i>Air Pollution Control (Construction Dust) Regulation</i> should also be followed to ensure that any dust impacts are minimised.</li> <li>▪ Requirements stipulated in the <i>Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation</i> and <i>Air pollution Control (Fuel Restriction) Regulation</i> will be followed to control potential emissions from non-road mobile machinery.</li> <li>▪ Requirements stipulated in the <i>Air Pollution Control (Marine Light Diesel) Regulation</i> and <i>Air Pollution Control (Fuel for Vessels) Regulation</i> will be followed to control potential marine vessel emissions.</li> <li>▪ As per Clause 3.4.3 of the EIA Study Brief, a comparative assessment has been carried out to evaluate the potential air quality impacts arising</li> </ul> |

| Item  | Description   |
|---|---|
|   | <p>from the concerned units with and without the Project. The purpose of the comparative assessment is to demonstrate that the potential air quality impacts from the operation of new OCGTs (i.e. the proposed GT8, GT9, GT10 and GT11) are lower than those from the operation of existing OCGTs/CCGT (i.e. GT2, GT3, GT4, GT57 and GT6) at the identified representative ASRs within the Assessment Area.</p> <ul style="list-style-type: none"> <li>■ If the result of the comparative assessment shows increased air quality impacts at ASRs due to operation of the new OCGTs, cumulative assessment would be carried out to evaluate the cumulative impacts at these ASRs against the new AQOs.</li> </ul>   |
| <p>Key Decommissioning/ Demolition and Construction Impacts</p> | <p>Minor excavation works during decommissioning/ demolition and construction phases of the Project are identified to be the potential dust generating activities. Due to the small-scale demolition and construction activities, and large separation distance between the worksite and the nearest ASR, no adverse dust impact arising from the decommissioning/ demolition and construction activities of the Project is anticipated.</p>  |
| <p>Key Operation Impacts</p>                                    | <p>Stack emissions from the proposed new OCGTs would be the major air emission source of operation phase air quality impact. Results of the comparative assessment show that contribution from the Project (i.e. NO<sub>2</sub>, SO<sub>2</sub>, RSP and FSP) under all phases of "With Project" scenario is lower than that under "Without Project" scenario at all relevant assessment heights for all identified ASRs. No adverse air quality impact arising from the operation of the Project is anticipated.</p>   |
| <p>Key Mitigation Measures</p>                                  | <p>Decommissioning/ Demolition and Construction Phases:<br/> Dust control measures stipulated in the <i>Air Pollution Control (Construction Dust) Regulation</i> will be implemented during the decommissioning/ demolition and construction activities for the Project to reduce the potential fugitive dust emissions. Requirements stipulated in the <i>Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation</i> and <i>Air Pollution Control (Fuel Restriction) Regulation</i> will also be followed to control emissions from construction plant. In addition, requirements stipulated in <i>Air Pollution Control (Marine Light Diesel) Regulation</i> and <i>Air Pollution Control (Fuel for Vessels) Regulation</i> will be followed to control potential emissions from marine vessels.</p> <p>Operation Phase:<br/> With proper maintenance of the proposed new OCGTs on a regular basis, no specific mitigation measures are required during the operation phase.</p> |
| <p>Residual Impacts</p>   | <p>Decommissioning/ Demolition and Construction Phases:<br/> With the implementation of the recommended dust control measures, no adverse residual impacts are anticipated.</p> <p>Operation Phase:<br/> With proper maintenance of the proposed new OCGTs on a regular basis, no adverse residual impacts are anticipated.</p>   |
| <p>Compliance with <i>EIAO-TM</i></p>                           | <p>The assessment and the potential impacts are acceptable and in compliance with the <i>EIAO-TM Annexes 4 and 12</i> and applicable assessment standards/ criteria.</p>  |

### 9.3.2 Noise

**Table 9.2** presents a summary of the key findings of the assessment of potential impacts to ambient noise level as a result of the decommissioning/demolition, construction and operation of this Project. Full details of the assessment and mitigation measures are presented in **Section 4** of this EIA Report.

**Table 9.2 Summary of Environmental Assessment and Outcomes – Noise**

| Item   | Description  |
|--|--|
| Noise Sensitive Receivers (NSRs)                         | In accordance with Section 3.4.4.2 of the EIA Study Brief, the Assessment Area for the noise impact assessment covers a distance of 300 m from the boundary of the Project site.<br><br>No NSR was found within the 300m Assessment Area. Beyond the Assessment Area, two existing NSRs were identified at 810m and 1,450m from the Project site boundary, and are illustrated in <b>Figure 4.1</b> .  |
| Assessment Methodology and Criteria                      | The methodology for the noise impact assessment is in accordance with the procedures outlined in the <i>GW-TM</i> , which is issued under the <i>NCO</i> and the <i>EIAO-TM</i> .  |
| Key Decommissioning/ Demolition and Construction Impacts | Potential sources of noise impacts during the decommissioning/ demolition and construction phases of the Project will mainly arise from powered mechanical equipment (PME) operating at the construction work sites. No NSR was identified within the 300m Assessment Area, and the nearest NSR is at least 810m from the Project site boundary. Due to large separation distance and screening by terrain and existing building structures, the potential noise impacts arising from the demolition and construction works are expected to be minimal.<br><br>No existing or planned NSR was identified within 300m distance from the Project site boundary. All NSRs are located far away from the LPS jetty (at least 1.6km) and further away from the marine vessel route. With no more than 1 to 2 vessel trips within every 2 days, no adverse noise impact due to marine traffic during decommissioning/ demolition, and construction phases are anticipated. |
| Key Operation Impacts                                    | Results of quantitative noise assessment showed that the predicted noise levels at 1m from the façade of the identified NSR (i.e. N2) comply with the respective noise criteria during daytime and night-time periods. No adverse noise impacts due to operation of the proposed new OCGTs are anticipated.  |
| Key Mitigation Measures                                  | In view of the insignificant noise impact arising from the Project, no mitigation measures are therefore required for both construction and operation phases.  |
| Residual Impacts   | In view of the insignificant noise impact arising from the Project, no residual impacts are anticipated.   |
| Compliance with <i>EIAO-TM</i>                           | The assessment and the potential impacts are in compliance with the <i>EIAO-TM Annexes 5 and 13</i> and applicable assessment standards/ criteria.   |

### 9.3.3 Water Quality

**Table 9.3** presents a summary of the key findings of the assessment of potential impacts to water quality as a result of the decommissioning/ demolition/ construction and operation of this Project. Full details of the assessment and mitigation measures are presented in **Section 5** of this EIA Report.

**Table 9.3 Summary of Environmental Assessment and Outcomes – Water Quality**

| Item   | Description   |
|--|---|
| Water Sensitive Receivers (WSRs)                         | In accordance with Section 3.4.5.2 of the EIA Study Brief, the Assessment Area for the water quality impact assessment includes areas within 500m from the boundary of the Project site and covers the Southern WCZ under the WPCO. A total of five existing WSRs were identified and illustrated in <b>Figure 5.1</b> .  |
| Assessment Methodology and Criteria                      | The potential impacts due to the decommissioning/ demolition, and construction of the Project were assessed following the <i>EIAO-TM Annex 6</i> guidelines and the impacts evaluated based on the criteria in <i>EIAO-TM Annex 14</i> . Potential water quality impacts on WSRs were evaluated according to the corresponding WQO criteria or other proposed assessment criteria.  |
| Key Decommissioning/ Demolition and Construction Impacts | Wastewater, chemical waste or effluent may be generated from the cleaning process during the decommissioning of the existing units. Sewage effluent from construction workforce and runoff from work sites may also be generated during the decommissioning/ demolition, and construction phases. With the implementation of the recommended management and mitigation measures, no unacceptable water quality impact is expected from the decommissioning process, demolition/ construction activities, or sewage effluent from construction workforce.  |
| Key Operation Impacts                                    | There will be no cooling water discharge associated with the operation of the Project and thus water quality impacts during operation phase are not expected.   |
| Key Mitigation Measures                                  | Decommissioning Phase:<br>Wastewater, chemical waste and effluent from cleaning of the existing OCGTs would be collected, stored for proper disposal by licensed contractor. Dismantled parts of the existing OCGTs would be removed from the site as soon as practicable. Before their removal, these parts would be placed at impervious surface and be protected from rain.<br><br>Demolition and Construction Phases:<br>Standard site practices outlined in <i>ProPECC PN 1/94 "Construction Site Drainage"</i> will be followed as far as practicable in order to reduce surface runoff, and also to retain and reduce any SS prior to discharge. |
| Residual Impacts   | With the implementation of the recommended mitigation measures, no residual impacts are anticipated during decommissioning/demolition, and construction phases.   |
| Compliance with <i>EIAO-TM</i>                           | The assessment and the potential impacts are in compliance with the <i>EIAO-TM Annexes 6</i> and <i>14</i> and applicable assessment standards/ criteria.   |

### 9.3.4 Waste Management

**Table 9.4** presents a summary of the key findings of the assessment of the waste management implications associated with the decommissioning/demolition, construction and operation of this Project. Full details of the assessment and mitigation measures are presented in **Section 6** of this EIA Report.

**Table 9.4 Summary of Environmental Assessment and Outcomes – Waste**

| Item   | Description  |
|--|--|
| Assessment Methodology and Criteria                      | <p>The potential environmental impacts associated with the handling and disposal of waste arising from the decommissioning/ demolition, construction and operation of this Project have been assessed in accordance with the criteria presented in <i>Annexes 7 and 15</i> of the <i>EIAO-TM</i>:</p> <ul style="list-style-type: none"> <li>■ Estimation of the types and quantities of the wastes to be generated; and</li> <li>■ Assessment of the secondary environmental impacts due to the management of waste with respect to potential hazards, air and odour emissions, noise, wastewater discharges and traffic.</li> </ul> <p>The Project would only generate limited quantity of waste and is not expected to cause any impacts on the capacity of waste facilities. The potential impacts on the capacity of waste collection, transfer and disposal facilities is thus not assessed.</p> |
| Key Decommissioning/ Demolition and Construction Impacts | <p>The key potential impacts during the decommissioning/ demolition, and construction phases are related to wastes generated from (1) demolition and removal of existing units and associated equipment, (2) excavation for the construction of new cable trenches, new staircase and lift, and reconstruction works at GTAB, (3) Minor civil works for the construction of the new staircase and lift, (4) chemical waste from decommissioning of existing units, maintenance of construction plant and equipment, and commissioning of new units, and (5) general refuse from construction workforce. All the wastes produced during the decommissioning/ demolition, and construction phases are of small quantity and will be disposed of accordingly to their nature and relevant regulations, avoiding any potential adverse impact.</p>   |
| Key Operation Impacts                                    | <p>General refuse and chemical waste will be produced during the operation phase. The potential environmental impacts associated with waste storage, handling, collection, transport and disposal will meet the criteria specified in the <i>EIAO-TM</i>, thus no unacceptable operational waste management impact is anticipated.</p>   |
| Key Mitigation Measures                                  | <p>Decommissioning/ Demolition, and Construction Phases:<br/>A Waste Management Plan (WMP) will be devised which incorporates recommended mitigation measures that have been proposed to avoid or reduce potential adverse environmental impacts associated with handling, collection, transport and disposal of waste arising from the decommissioning/ demolition and construction of this Project.</p> <p>Operation Phase:<br/>General refuse will be collected, handled, transported and disposed of by existing waste management contractor at LPS following the existing waste management practices at LPS. Chemical waste will be collected by licenced chemical waste collectors and delivered to the CWTC for disposal.</p>   |
| Residual Impacts   | <p>With the implementation of the recommended mitigation measures, in particular the establishment and implementation of the WMP, no adverse residual impacts are anticipated from the decommissioning/demolition, construction and operation of this Project.</p>   |
| Compliance with <i>EIAO-TM</i>                           | <p>The assessment and the potential impacts are in compliance with the <i>EIAO-TM Annexes 7 and 15</i> and applicable assessment standards/ criteria.</p>  |

### 9.3.5 Land Contamination

**Table 9.5** presents a summary of the key findings of the assessment of the potential land contamination impacts to future land users within the Project site. Full details of the assessment and mitigation measures are presented in **Section 7** of this EIA Report.

**Table 9.5 Summary of Environmental Assessment and Outcomes – Land Contamination**

| Item   | Description   |
|--|---|
| Assessment Methodology and Criteria                      | <p>The following legislation and guiding documents have been considered in the land contamination assessment.</p> <ul style="list-style-type: none"> <li>■ <i>Annex 19 of EIAO-TM;</i></li> <li>■ <i>Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management (The RBRGs Guidance Manual);</i></li> <li>■ <i>Guidance Note for Contaminated Land Assessment and Remediation (The Guidance Note);</i> and</li> <li>■ <i>The Practice Guide for Investigation and Remediation of Contaminated Land (The Practice Guide).</i></li> </ul> <p>Apart from the abovementioned, the following legislation, documents and guidelines may cover or have some bearing upon the assessment of contamination and the handling, treatment and disposal of contaminated materials for the Project:</p> <ul style="list-style-type: none"> <li>■ <i>Water Pollution Control Ordinance (WPCO) (Cap 358);</i></li> <li>■ <i>Waste Disposal Ordinance (WDO) (Cap 354);</i></li> <li>■ <i>Waste Disposal (Chemical Waste) (General) Regulation (Cap 354C);</i> and</li> <li>■ <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.</i></li> </ul>  |
| Key Decommissioning/ Demolition and Construction Impacts | <p>The reclamation for LPS was completed between late 1970s and early 1980s during which the Project site was vacant. The existing GT2, GT3, GT4, GT5, GT6 and GT7 were constructed within the Project site and put into operation in 1989. GT5 and GT7 were later converted into a CCGT (i.e. GT57) in 2002. The operation of GT compound remained unchanged since 2002 until present with no historical spillage or leakage incidents reported.</p> <p>Based on observations from site walkover conducted in January 2021, the outdoor portions of whole Project area, including vehicle access roads and outdoor area, was concrete paved and in good condition. No signs of oil stains or chemical stains were noted along the access roads as well as the alignment of proposed new cable trenches during the site walkover.</p> <p>Based on the site appraisal findings and review of land contamination potentials in the Project area, SI is recommended at five hotspot locations (i.e. 4 boreholes and 1 trial pit) to assess the potential land contamination impacts within the Project site. SI and sampling will be undertaken when the proposed sampling locations are made available after the demolition of the existing units and structures.</p> |
| Key Operation Impacts                                    | <p>Land contamination impacts during the operation phase are not anticipated.</p>   |
| Key Mitigation Measures                                  | <p>No mitigation measures are required. During decommissioning/ demolition, and construction phases, good house-keeping practices shall be maintained by the contractor(s) to minimise the risk of land contamination due to decommissioning/ demolition, and construction activities, including but not limited to the following:</p> <ul style="list-style-type: none"> <li>■ Minimise the chemical stock within the Project site, only store the amount of chemicals needed;</li> <li>■ Designated chemical/ chemical waste storage shall be established on concrete paved ground, as far as practicable. Secondary containments shall be provided for storage of chemicals/ chemical wastes;</li> <li>■ Conduct regular maintenance and inspection on plants and equipment, particularly those involve the use of fuel, hydraulic oil or any sort of chemicals; and</li> </ul>  |

| Item                           | Description   |
|--------------------------------|---|
|                                | <ul style="list-style-type: none"> <li data-bbox="555 253 1246 282">■ Divert rainfall and surface run-off around construction areas.</li> </ul> |
| Residual Impacts               | No residual impact in respect of land contamination within the Project site is expected.  |
| Compliance with <i>EIAO-TM</i> | The assessment and the potential impacts are in compliance with the <i>EIAO-TM Annex 19</i> and applicable assessment standards/ criteria.      |

### 9.3.6 Summary

The assessment of the potential environmental impacts associated with the decommissioning/ demolition, construction and operation phases of the Project at the LPS demonstrated that the implementation of the Project will not cause adverse or unacceptable environmental impacts in accordance with the requirements of the EIA Study Brief and criteria stipulated in the *EIAO-TM*.

An environmental audit programme will be implemented to audit the environmental performance of the Contractor(s) during the implementation of the decommissioning/ demolition and construction activities and verify the findings of the EIA study.