

## **10a. LANDSCAPE AND VISUAL IMPACT (TTAL SITE)**

### **10a.1 Introduction**

10a.1.1.1 This section presents the assessment of the landscape and visual impact due to the construction and operation of the IWMF at the Tsang Tsui Ash Lagoon (TTAL) site.

10a.1.1.2 The photomontages and layouts provided in this report are based on a reference design prepared for this EIA study purpose only. The actual design of the IWMF proposal will be subject to further refinement by the DBO contractor during the design stage.

### **10a.2 Description of Proposed Works**

10a.2.1.1 The proposed works in the TTAL site involve the construction and operation of the IWMF, which includes a thermal incineration plant, a sorting and recycling plant, and ancillary and supporting facilities.

10a.2.1.2 The key activities and issues of the proposed works related to the impact on the landscape and visual context include:-

#### Construction Phase

- Loss of ash lagoon area and vegetation, presence of construction machinery, site formation, and construction of facilities.

#### Operation Phase

- Presence of the built structures; and
- Waste transportation traffic to and from the IWMF.

### **10a.3 Environmental Legislation and Standards**

10a.3.1.1 The following environmental legislation and standards have been considered:

- Country Parks Ordinance (Cap. 208);
- DSD Technical Circular No. 2/2004 Protection of Natural Rivers and Streams from Adverse Impacts Arising from Construction Works – provides guidelines for the planning and execution of construction works;
- DSD Practice Note No. 1/2005 “Guidelines on Environmental Consideration for River Channel Design”;
- EIAO Guidance Note No. 8/2010 – sets up guidelines for preparation of Landscape and Visual Impact Assessment under EIAO;
- Environmental Impact Assessment Ordinance (EIAO) (Cap. 499), Annexes 10 and 18 of Environmental Impact Assessment Ordinance (EIAO) Technical Memorandum;

- ETWB TCW No. 2/2004 Maintenance of Vegetation and Hard Landscape Features – sets out the government departmental responsibilities for maintenance of vegetation and hard landscape features;
- ETWB TCW No.14/2004 Maintenance of Stormwater Drainage Systems and Natural Watercourses – sets out the departmental responsibilities for the maintenance of storm water drainage systems and natural watercourses in government and private lands, as well as the main watercourses designated under the Land Drainage Ordinance;
- ETWB TCW No. 29/2004 Registration of Old and Valuable Trees and Guidelines for their Preservation – provides priority protection to the trees in the Register. Furthermore, the Government has already put in place a comprehensive range of administrative and legislative measures to preserve trees on Government land;
- ETWB TCW No. 5/2005 Protection of Natural Streams/Rivers from Adverse Impacts Arising from Construction Works – clarifies and strengthens the existing measures for protection of natural streams / rivers from Government projects and private developments;
- ETWB TCW No. 3/2006 Tree Preservation – defines and covers the reporting of unauthorized tree removal (i.e. felling or transplanting), on both private and unleased Government land;
- GEO Publication No. 1/2000 – “Technical Guidelines on Landscape Treatment and Bio-Engineering for Man-made Slope and Retaining Walls”;
- Government General Regulation 740 – sets out restrictions on the preservation and felling of trees in Hong Kong;
- Hong Kong Planning Standards and Guidelines Chapter 4 and Chapter 11;
- Protection of Endangered Species of Animals and Plants Ordinance (Cap 586);
- The Forests and Countryside Ordinance (Cap. 96) – prohibits felling, cutting, burning or destroying of trees and growing plants in forests and plantations on government land. Its subsidiary regulations prohibit the picking, felling or possession of listed rare and protected plant species;
- The Forestry Regulations – makes under Section 3 of the Forests and Countryside Ordinance (Cap. 96) defining the list of protected species in Hong Kong;
- Technical Report of Landscape Value Mapping in Hong Kong by the Planning Department – establishes the essential landscape baseline information which provides a systematic reference framework to facilitate landscape assessment and broad environmental assessment of major projects at territorial level;
- Town Planning Ordinance and Town Planning (Amendment) Ordinance (Cap. 131); and
- WBTC No. 7/2002 Tree Planting in Public Works – affirms the advocated policy on tree planting which adopts a flexible and balanced approach in the planning and design of public works.

## **10a.4 Review of Planning and Development Control Framework**

### **10a.4.1 Objectives**

10a.4.1.1 A review of the existing and planned development framework for the proposed works and their surroundings has been conducted. It aims to:

- Identify issues for the neighbouring planned land uses;

- Identify the potential resources and sensitive receivers; and
- Ensure a high compatibility between the proposed works and the surroundings.

#### **10a.4.2 Existence of Statutory Plans**

10a.4.2.1 The following Outline Zoning Plans (OZP) have been reviewed: Sheung Pak Nai & Ha Pak Nai Outline Zoning Plan OZP no. S/YL-PN/9 (Approved – 17.10.2006); Ping Shan OZP no. S/YL-PS/12 (Draft – 5.11.2010); Lam Tei & Yick Yuen OZP no. S/TM-LTY/6 (Approved – 14.3.2006) and Tuen Mun OZP no. S/TM/27 (Draft – 3.9.2010). The project site is not covered by any OZP and no land use is specified in the statutory plan as per **Figure 10a.1**. Therefore, there is no proposed change to the OZPs due to the development of the IWMF at the TTAL site.

### **10a.5 Baseline Study Methodology**

#### **10a.5.1 Introduction**

10a.5.1.1 The landscape and visual impacts are assessed separately for the construction phase and the operation phase. The methodologies to assess landscape and visual impacts are described below.

#### **10a.5.2 Landscape Baseline Study Methodology**

10a.5.2.1 In accordance with the EIA Study Brief, a baseline survey of the existing landscape character areas (LCAs) and landscape resources (LRs) within 500m from the proposed works is undertaken by a combination of site inspections and desktop surveys. The proposed works within and adjacent to the study area are considered.

10a.5.2.2 The baseline survey forms the basis of the landscape context by describing broadly homogenous units of similar character. Environmental capital approach is adopted to classify the landscape into distinct LCAs based on distinct patterns or combinations of landscape resources / elements that occur consistently in a particular landscape. “Study of Landscape Value Mapping of Hong Kong” and “Map of Land Utilization in Hong Kong” by the Planning Department are also considered for the identification of LCAs and LR. The landscape elements considered include:

- Local topography;
- Woodland and other vegetation types;
- Built form, land use and patterns of settlement;
- Scenic spots;
- Details of local materials;
- Natural and artificial coastlines;
- Prominent watercourses and water bodies;
- Cultural and religious identity, and
- Geological features.

### Sensitivity of LCAs and LRs

10a.5.2.3 The individual landscape character areas (LCAs) / landscape resources (LRs) are described qualitatively and quantitatively. Their sensitivities are then evaluated and rated as low, medium or high based on the following factors:

- Quality, condition and value of landscape character / resource;
- Importance and rarity of special landscape resources;
- Ability of the landscape to accommodate change without compromising its essential nature;
- Significance of the character / resource in local and regional context; and
- Maturity of the landscape.

10a.5.2.4 The rating of the sensitivity of the LCAs / LRs is assessed as follows:

- High** Important components of a landscape of particularly distinctive character susceptible to relatively small changes.
- Medium** A landscape of moderately valued characteristics reasonable tolerant to change.
- Low** Relatively unimportant landscape, able to absorb significant change.

### Magnitude of Change of LCAs and LRs

10a.5.2.5 Some common factors that are considered in deriving the magnitude of change in assessing landscape impacts are as follows:

- Compatibility of the Project with the landscape resource;
- Duration of impacts under the construction and operation phases;
- Scale of the development; and
- Reversibility of change.

10a.5.2.6 The rating of the magnitude of change of the LCAs / LRs is assessed based on the above criterion as follows:

- Large** LCA or LR will suffer a large change due to the proposed works.
- Intermediate** LCA or LR will suffer a moderate change due to the proposed works.
- Small** LCA or LR will suffer a perceptible change due to the proposed works.
- Negligible** LCA or LR will suffer no discernible change due to the proposed works.

### **10a.5.3 Visual Baseline Study Methodology**

10a.5.3.1 The baseline survey of views towards the proposed development is carried out within the zone of visual influence.

10a.5.3.2 The visual envelope (zone of visual influence), according to EIAO GN No. 8/2010, is generally the view shed formed by natural/man-made features such as ridgeline or building blocks. The visual envelope may contain areas that are fully visible, partly visible and non-visible from the proposed works. The visual sensitive receivers (VSRs) are those within the visual envelope whose views will be affected by the proposed works.

#### Sensitivity of VSRs

10a.5.3.3 The baseline survey describes and records the typical views from the VSRs and their characters and values within the visual envelope at low-level viewpoints (street level) and high-level viewpoints (hillside vantage points). Both present and future VSRs are considered.

10a.5.3.4 In the assessment of the sensitivity of the VSRs, the type of VSR is the key factor to be considered. Those VSRs who view the proposed works from their homes are considered to be highly sensitive as the attractiveness, or otherwise, of the view from their homes would have a substantial effect on their perception of the quality and acceptability of their home environment and their general quality of life. Those VSRs who view the proposed works from their workplaces / schools are considered to be less sensitive in general as the attractiveness or otherwise of the view from their workplaces / schools would have a less important role in their perception of the quality of the working environment. The sensitivity also depends on whether the workplace is industrial, retail or commercial. For those VSRs who view the proposed works while engaging in outdoor leisure activities, their sensitivity depends on the type of leisure activity. For those VSRs who view the proposed works from public thoroughfares, their sensitivity depends on the speed of travel.

10a.5.3.5 The criteria for ranking the sensitivity of a VSR are:

- Type of representative receiver population;
- Value and quality of the existing view;
- Estimated number of representative receiver population;
- Availability and amenity of alternative views;
- Duration or frequency of views; and
- Degree of visibility.

10a.5.3.6 The rating of the sensitivity of the VSRs is assessed as follows:

<b>High</b>	Highly sensitive to any change in their viewing experience.
<b>Medium</b>	Moderately sensitivity to any change in their viewing experience.
<b>Low</b>	Only slightly sensitive to any change in their viewing experience.

#### Magnitude of Change to VSRs

10a.5.3.7 The common factors considered in deriving the magnitude of change in assessing the visual impacts are as follows:

- Compatibility of the Project with the surrounding landscape;
- Duration of impacts under the construction and operation phases;

- Scale of development;
- Reversibility of change;
- Viewing distance; and
- Potential blockage of view.

10a.5.3.8 The rating of the magnitude of change to the VSRs is based on the above criterion assessed as follows:

- Large** VSRs will suffer a large change due to the proposed works.  
**Intermediate** VSRs will suffer a moderate change due to the proposed works.  
**Small** VSRs will suffer a perceptible change due to the proposed works.  
**Negligible** VSRs will suffer no discernible change due to the proposed works.

#### 10a.5.4 Impact Significance Threshold Assessment Methodology

##### Impact Significance Threshold before Mitigation

10a.5.4.1 The assessment of the potential landscape / visual impacts during the construction and operation phases with or without the proposed works is created by synthesizing the “Sensitivity” and “Magnitude of Change” for the LCAs/LRs/VSRs according to the Matrix of Impact Significance Threshold before Mitigation in **Table 10a.1**.

**Table 10a.1 Matrix for Impact Significance Threshold – Combination and Relationship between Sensitivity and Magnitude of Change**

Magnitude of Change due to the Proposed Works	Sensitivity of LR/LCA/VSR		
	Low	Medium	High
<b>Large</b>	<i>Moderate</i>	<i>Moderate / Substantial</i>	<i>Substantial</i>
<b>Intermediate</b>	<i>Slight / Moderate</i>	<i>Moderate</i>	<i>Moderate / Substantial</i>
<b>Small</b>	<i>Slight</i>	<i>Slight / Moderate</i>	<i>Moderate</i>
<b>Negligible</b>	<i>Insubstantial</i>	<i>Insubstantial</i>	<i>Insubstantial</i>

#### Degree of Impact Significance Threshold before Mitigation

10a.5.4.2 The degree of significance is categorized into four thresholds depending on the combination below:

<b>Substantial</b>	Adverse / beneficial impact where the proposed works would cause significant deterioration / improvement in the existing landscape / visual quality.
<b>Moderate</b>	Adverse / beneficial impact where the proposed works would cause noticeable deterioration / improvement in the existing landscape / visual quality.
<b>Slight</b>	Adverse / beneficial impact where the proposed works would cause barely perceptible deterioration / improvement in the existing landscape / visual quality.
<b>Insubstantial</b>	No discernible change in the existing landscape / visual quality.

#### **10a.5.5 Residual Impacts Assessment Methodology**

10a.5.5.1 Residual impacts are those impacts remaining after the proposed mitigation measures have been implemented. The planting mitigation measures are deemed to have reached a level of maturity to perform their original design objectives 10 to 15 years after the implementation of the mitigation measures.

10a.5.5.2 The level of residual impact is derived from the magnitude of change which the proposed works will cause to the existing view or landscape character and the ability to the LR/LCAs/VSRs to tolerate change, i.e. the quality and sensitivity of the view or landscape character taking into account the beneficial effects of the proposed mitigation measures. The significance threshold is derived from the matrix shown in **Table 10a.1**.

10a.5.5.3 Impacts ranged from “Substantial” to “Moderate” are considered as non-ideal situations, and corresponding mitigation measures are recommended. Mitigation measures are also considered for the purpose of potential landscape and visual enhancement.

#### **10a.5.6 Photomontage Illustration for Selected Views**

10a.5.6.1 Representative views from the VSRs are selected to illustrate the effectiveness of the proposed mitigation measures and the residual impacts of the proposed works in both short and long term. For each selected VSR, photomontages are prepared for:

- Existing baseline condition (Day 1 of Construction Phase)
- Development without mitigation
- Development with mitigation (Day 1 of Operation Phase)
- Development with mitigation (10 years of Operation Phase)

### **10a.5.7 Overall Result of Assessment**

10a.5.7.1 In accordance with Annex 10 of the EIAO TM, an overall assessment is made for the proposed works based on the residual landscape and visual impacts as follows:

<b>Beneficial</b>	The proposed works will complement the landscape and visual character of its setting, follow the relevant planning objectives, and improve overall and visual quality.
<b>Acceptable</b>	There will be no significant effects on the landscape, no significant visual effects, and no interference with the key views due to the proposed works.
<b>Acceptable with Mitigation Measures</b>	There will be some adverse effects due to the proposed works, but the adverse effects can be eliminated, reduced or offset to a large extent by the proposed mitigation measures.
<b>Unacceptable</b>	There will be the adverse effects that are considered too excessive and are unable to mitigate practically.
<b>Undetermined</b>	Significant adverse effects are likely, but the extent to which they may occur or may be mitigated cannot be determined from the study. Further detailed study will be required for the specific effects in question.

## 10a.6 Baseline study

### 10a.6.1 Identification of Landscape Resources (LRs)

10a.6.1.1 The details and locations of LRs are shown **Table 10a.2** and **Figure 10a.2** respectively. The photos showing the LRs are presented in **Figures 10a.3** to **10a.4**.

**Table 10a.2 Landscape Resources within Study Area**

I.D. no.	Landscape Resources (LRs)	Quantity (ha) (Within Project Site / Within Study Area)	Description
LR1	Ash Lagoon & Trees	46	<ul style="list-style-type: none"> <li>This LR refers to the ash lagoon area that is comprised of the East, Middle and West Lagoons. The project site lies in the northern part of the Middle Lagoon.</li> <li>The ash lagoons are formed for storage of pulverized fuel ash (PFA) generated from the adjacent power plants. Ash lagoon is an uncommon landscape resource in Hong Kong. However, the landscape value for this kind of landscape resource is considered low.</li> <li>The ash dumping activities in the Middle Lagoon ceased for years. Throughout the years, a number of grasses, creepers, groundcovers, and small shrubs have grown. Larger shrubs and even small trees, such as <i>Macaranga tanarius</i> and <i>Leucaena leucocephala</i>, are found at the edge of the lagoon and along the seawall. The trees are mature. At the northern part of the middle lagoon, 47 nos. of trees of three common species (<i>Celtis sinensis</i>, <i>Macaranga tanarius</i> &amp; <i>Bombax ceiba</i>) were recorded in the tree survey. There is no registered Old and Valuable Tree in this LR.</li> <li>Some portions of the Middle Lagoon are marshy with plants and water ponds. The coverage of water ponds varies with seasons, ranging from approximately 20% to 50% of the Middle Lagoon. The water ponds are mainly located at the southern part of the Middle Lagoon. About 80% area of the north part of the Middle Lagoon is a bare ground with little vegetation.</li> </ul>
LR2	Seashore	4.5	<ul style="list-style-type: none"> <li>This LR refers to the artificial seawall along the edge of ash lagoons. It is in the form of sloping boulders and of typical man-made exposed seawalls in Hong Kong.</li> <li>Some plants (e.g. <i>Celtis sinensis</i>, <i>Lantana camara</i> and <i>Ficus virens</i>) are found at the seawall.</li> </ul>
LR3	Tidal Stream	1.0	<ul style="list-style-type: none"> <li>This LR refers to a semi-natural to man-made water channel and its tributaries located to the south of the ash lagoons. The water channel collects water from its tributaries that run down from the valleys of Castle Peak, and drains the water from west to east towards the Deep Bay.</li> <li>Shrubby vegetation and occasional trees are found along the banks of the water channel.</li> </ul>

I.D. no.	Landscape Resources (LRs)	Quantity (ha) (Within Project Site / Within Study Area)	Description
LR4	Woodland & Shrubland	8.8	<ul style="list-style-type: none"> <li>• This LR refers to the woodland located to the south of the project site and the shrubland close to the water channel located to the north of this LR. In the woodland, there are signs of previous human activities, such as a building structure, paved / unpaved roads, concrete platform. The shrubland is sparse with low species diversity.</li> <li>• The woodland and shrubland are mature. The trees found in this LR are common species, such as <i>Celtis sinensis</i>, <i>Leucaena leucocephala</i>, <i>Ligustrum sinense</i>, <i>Macaranga tanarius</i>, <i>Microcos paniculata</i>, <i>Rhus spp.</i>, <i>Sterculia lanceolata</i>, etc. There is no registered Old and Valuable Tree in this LR.</li> <li>• The area was previously a seaside village. It can be dated back to as early as Neolithic Age according to the pottery and stone tools pieces excavated during an archaeological investigation for Tsang Tsui Archaeological Site (TTAS) carried out in 2000. However, there is little human trace to be observed on site nowadays. Access to this abandoned village is rarely known as the area is covered by dense vegetation with only one access full of gravel and dirt.</li> </ul>
LR5	Vegetated Slope	32.5	<ul style="list-style-type: none"> <li>• This LR refers to the man-made slopes (cut slopes) and the hillside, disturbed areas located to the south of the ash lagoons.</li> <li>• The man-made slopes are planted with hydroseeding and woodland mix. Self-seeded trees are also found. The trees found in the slopes are common species, such as <i>Acacia spp.</i>, <i>Casuarina equisetifolia</i>, <i>Celtis sinensis</i>, <i>Eucalyptus spp.</i>, <i>Ficus spp.</i>, <i>Macaranga tanarius</i>, etc.</li> <li>• The hillside, disturbed areas are with high population of grasses and groundcovers. Small trees, mostly <i>Macaranga tanarius</i> and <i>Leucaena leucocephala</i>, and shrubs are randomly scattered in the areas.</li> <li>• The trees are mature in general. There is no registered Old and Valuable Tree in this LR.</li> </ul>
LR6	Landfill	3.3	<ul style="list-style-type: none"> <li>• This LR refers to the existing WENT Landfill, which is characterized by heavy trucks, dust, smells, landfill / industrial nature.</li> <li>• The access to the WENT Landfill is restricted.</li> </ul>
LR7	Seawater of Nim Wan	72.2	<ul style="list-style-type: none"> <li>• This LR refers to the Deep Bay to the north of the project site.</li> </ul>
LR8	Factories	6.3	<ul style="list-style-type: none"> <li>• This LR refers to the grease treatment plant with storage tanks and associated facilities. The facilities are within the boundary of the WENT Landfill.</li> </ul>
LR9	Temple Structure	0.003	<ul style="list-style-type: none"> <li>• Surrounded by the dense woodland (LR4), there is Hung Shing and Dragon Mother Temple, which is a single-storey, two-room building structure. The history of the temple can be traced back to 1950s according to the memorandum found in the temple. It was re-built in 1980s with cement mortar &amp; steel after fire damage. The building is currently in good condition. About 10 nos. of graves are found in the Tsang Tsui Archaeological Site built around 1930s. Some have been abandoned and are in poor condition.</li> </ul>

### 10a.6.2 Identification of Landscape Character Areas (LCAs)

10a.6.2.1 The details and locations of LCAs are shown in **Table 10a.3** and **Figure 10a.5** respectively. The photos showing the LCAs are presented in **Figure 10a.6**.

**Table 10a.3 Landscape Character Areas within Study Area**

I.D. no.	Landscape Character Areas (LCAs)	Quantity (ha) (Within Project Site / Within Study Area)	Description
<b>LCA1</b>	Ash Lagoon	46	<ul style="list-style-type: none"> <li>• This LCA refers to the ash lagoons.</li> <li>• The ash lagoons were formed for storage of pulverized fuel ash (PFA) generated from the adjacent power plants. It is an uncommon landscape in Hong Kong due to its function. However, the landscape value is considered low.</li> <li>• This LCA is characterized by human intervention converting the former ash lagoon into water collection and conservation lagoon of a dumping site nature.</li> <li>• The area is mostly covered with exposed ash, water ponds, medium-tall grasses, small shrubs, stones and creepers due to its past development phases.</li> <li>• The ash lagoons are separated by unpaved roads serving as vehicular accesses for trucks.</li> <li>• The project site lies on the northern part of the Middle Lagoon. The northern part of the East Lagoon located to the east of the project site will be used for the development of the Sludge Treatment Facilities (STF).</li> </ul>
<b>LCA2</b>	Landfill Landscape	9.6	<ul style="list-style-type: none"> <li>• This LCA refers to the degraded land made up of landfill site (LR6), together with their associated access haul roads, artificial cut and fill slopes, modified surface drainage system, waste reception area, leachate treatment system, grease treatment plants, and storage tanks (LR8).</li> <li>• This LCA is characterized by industrial nature lands, construction plants, equipment and heavy trucks. The access to the landfill site and its associated facilities is restricted.</li> </ul>

I.D. no.	Landscape Character Areas (LCAs)	Quantity (ha) (Within Project Site / Within Study Area)	Description
LCA3	Abandoned Village	15.1	<ul style="list-style-type: none"> <li>• This LCA refers to the abandoned seaside village to the south of the ash lagoon. It can be dated back to as early as Neolithic Age according to the pottery and stone tools pieces excavated during an archaeological investigation for Tsang Tsui Archaeological Site (TTAS), located at the south-western part of this LCA, carried out in 2000. However, there is little human trace to be observed on site nowadays.</li> <li>• The only apparent existing human trace is the two-room building structure, which is the Hung Shing and Dragon Mother Temple. This kind of temple is commonly found in some seaside villages. The temple is covered by dense woodland at north-western part of this LCA. The history of the temple can be traced back to 1950s according to the memorandum found in the temple. It was re-built in 1980s with cement mortar &amp; steel after fire damage. The building is currently in good condition.</li> <li>• About 10 nos. of graves are found in the TTAS built around 1930s. Some have been abandoned and are in poor condition.</li> <li>• Access to this area is limited as this area is covered by dense vegetation with only one gravel access.</li> <li>• A large portion of this LCA is covered by woodland.</li> <li>• Weeds are extensively found at the area on the southern side of ash lagoon.</li> </ul>
LCA4	Barren Hillside	32.3	<ul style="list-style-type: none"> <li>• This LCA refers to the natural and steep hillside slope covered by low grasses and occasional shrubs and small trees.</li> <li>• It comprises of knolls, ridges and spurs with rocky outcrops or boulder fields.</li> <li>• Due to its steep topography and its proximity to the firing range, public access is extremely rare.</li> </ul>
LCA5	Inter-tidal Coast Landscape	76.7	<ul style="list-style-type: none"> <li>• This LCA covers seawater and the artificial seawall along the edge of ash lagoons. It is in the form of sloping boulders and of typical man-made exposed seawalls in Hong Kong.</li> <li>• It is open and as part of Deep Bay water body on northern side.</li> <li>• To the further north of the water body is the coastline of Shekou, which is at a distance of approx. 7km away.</li> <li>• It is characterized by its tranquility and sense of remoteness.</li> </ul>

### 10a.6.3 Identification of Visual Sensitive Receivers

10a.6.3.1 The details and locations of VSRs are shown in **Table 10a.4** and **Figure 10a.7** respectively. The photos showing the VSRs are presented in **Figure 10a.8**.

**Table 10a.4 Visual Sensitive Receivers within Visual Envelope**

I.D. no.	Visual Sensitive Receivers (VSRs)	Type of VSRs	Number of VSRs	Description
VSR1	Footpath Uphill	Occupational	Few	<ul style="list-style-type: none"> <li>This VSR refers to the workers who maintain and repair the pipe ducts and drainage systems on the slope to the southeast of the Middle Lagoon.</li> <li>The maintenance access used by the workers located uphill is restricted.</li> <li>While the view of the project site is screened off by the heavy vegetation at the ground level, the project site becomes visible to this VSR as they walk uphill along the maintenance access. At about 10m above the ground level, the full view of the project site can be seen by this VSR.</li> </ul>
VSR2	Nim Wan Road	Traveller	Few	<ul style="list-style-type: none"> <li>This VSR refers to the travellers who travel along Nim Nam Road to/from the ash lagoon area or the WENT Landfill. As both the WENT Landfill and the ash lagoon area are restricted area, the VSR is primarily dump truck drivers transporting waste to the WENT Landfill, operators of the WENT Landfill and workers in the ash lagoon area. Pedestrians are rarely present.</li> <li>The building structures in the project site are screened off by the trees along the roadside. Only a portion of the chimney would be visible to this VSR.</li> </ul>
VSR3	Sludge Treatment Facilities	Occupational & Visitors	Medium	<ul style="list-style-type: none"> <li>This VSR consists of the workers operating the Sludge Treatment Facilities (STF) and the visitors visiting the Environmental Education Centre (EEC) at STF.</li> <li>The STF workers would carry out indoor works in most circumstances.</li> <li>The visitors to EEC would have a good view of the architectural and landscape design of the IWMF being coherent with the STF, and the development of the two facilities would be integrated and blended well with each other.</li> </ul>
VSR4	Sea of Deep Bay	Sea Traveller & Occupational	Few	<ul style="list-style-type: none"> <li>This VSR includes the sea travelers travelling in the Deep Bay to/from Shekou, workers on vessels carrying waste containers to the WENT Landfill, and workers on fishing vessels.</li> <li>In normal situations, ships would not sail close to the site.</li> <li>Owing to the vast and exposed site, the proposed works will be visible by the VSR in a significant way, especially the presence of the high-rise stacks.</li> </ul>

I.D. no.	Visual Sensitive Receivers (VSRs)	Type of VSRs	Number of VSRs	Description
VSR5	Ha Pak Lai	Residents & Visitors	Medium	<ul style="list-style-type: none"> <li>This VSR refers to the residents &amp; visitors at Ha Pak Lai, located about 2km to the east of the project site.</li> <li>As there is a significant distance between the project site and the village, most of the proposed works will be barely seen by the VSR.</li> <li>The vista to the proposed works would be marginally blocked by the STF to the east of the project site.</li> </ul>
VSR6	Black Point Power Station	Occupational	Few	<ul style="list-style-type: none"> <li>This VSR refers to the operators of the Black Point Power Station, located to the southwest of the project site.</li> <li>The VSR's view of the buildings in the project site will be fully blocked by the existing slope (range from 20-100mPD) to the northeast of this VSR; only a portion of the chimney will be visible to this VSR.</li> </ul>

## 10a.7 Sources of Landscape and Visual Impact

### 10a.7.1 Sources of Landscape Impact

10a.7.1.1 The sources of landscape impact during the construction phase are shown in **Table 10a.5**.

**Table 10a.5 Sources of Landscape Impact during Construction Phase**

Code	Sources of Landscape Impact during Construction Phase
LC-01	<ul style="list-style-type: none"> <li>Removal / transplantation of the existing vegetation at the ash lagoon for site formation / building construction.</li> </ul>
LC-02	<ul style="list-style-type: none"> <li>Filling of the project site and leveling works at northern and eastern side of project site for the construction of access road (for waste transportation) connected to future access road constructed under the STF Project. The existing shoreline would not be affected.</li> </ul>
LC-03	<ul style="list-style-type: none"> <li>Loss of the ash lagoons due to site formation works in the Middle Lagoon, including clearance of boulders, and subsequent backfilling and leveling of the site.</li> </ul>
LC-04	<ul style="list-style-type: none"> <li>Foundation piling works (socketted H pile as recommended).</li> </ul>
LC-05	<ul style="list-style-type: none"> <li>Construction of new roads connecting the STF site, incinerators, boilers and 150m high chimney in the Middle Lagoon.</li> </ul>
LC-06	<ul style="list-style-type: none"> <li>Construction of ancillary facilities such as administration building &amp; Environmental Education Centre, steam turbine, refuse bunker, wastewater treatment plant, fly ash silos and treatment facilities, air compressor station, air cooled condenser, oil pump room, etc. in the Middle Lagoon.</li> </ul>
LC-07	<ul style="list-style-type: none"> <li>Underground excavation and connection for installation of utilities, including waterpipes, plumbing, drains, cables, etc. for the IWMF operation.</li> </ul>
LC-08	<ul style="list-style-type: none"> <li>Temporary site access, site cabins and heavy machinery.</li> </ul>

10a.7.1.2 The sources of landscape impact during the operation phase are shown in **Table 10a.6**.

**Table 10a.6 Sources of Landscape Impact during Operation Phase**

Code	Sources of Landscape Impact during Operation Phase
LO-01	<ul style="list-style-type: none"> <li>Completed incineration plant &amp; chimney.</li> </ul>
LO-02	<ul style="list-style-type: none"> <li>Completed ancillary buildings such as new administration building &amp; Environmental Education Centre and elevated bridge for visitors.</li> </ul>
LO-03	<ul style="list-style-type: none"> <li>Completed chemical storage building and chemical dosing area.</li> </ul>
LO-04	<ul style="list-style-type: none"> <li>Completed wastewater treatment plant and desalination plant.</li> </ul>

### **10a.7.2 Sources of Visual Impact**

10a.7.2.1 The sources of visual impact during the construction phase are shown in **Table 10a.7**.

**Table 10a.7 Sources of Visual Impact during Construction Phase**

Code	Sources of Visual Impact during Construction Phase
VC-01	<ul style="list-style-type: none"> <li>Visual obstruction by temporary and permanent construction plant and structures.</li> <li>Visual obstruction by construction activities and traffic within the project site.</li> <li>Visual obstruction by loss of open sea view.</li> </ul>
VC-02	<ul style="list-style-type: none"> <li>Visual quality affected due to site formation and bare soil surface.</li> </ul>
VC-03	<ul style="list-style-type: none"> <li>Visual quality affected due to glare generated by after-dark lighting and welding.</li> </ul>
VC-04	<ul style="list-style-type: none"> <li>Visual quality affected by dust generated by construction activities and traffic.</li> </ul>

10a.7.2.2 The sources of visual impact during the operation phase are shown in **Table 10a.8**.

**Table 10a.8 Sources of Visual Impact during Operation Phase**

Code	Sources of Visual Impact during Operation Phase
VO-01	<ul style="list-style-type: none"> <li>Visual quality affected by the completed 150m high chimney, incinerators and boilers.</li> </ul>
VO-02	<ul style="list-style-type: none"> <li>Visual quality affected by the completed ancillary buildings such as administration building &amp; Environmental Education Centre, steam turbine, refuse bunker, wastewater treatment plant, fly ash silos and treatment facilities, air compressor station, air cooled condenser, oil pump room, etc. on ash lagoon.</li> </ul>
VO-03	<ul style="list-style-type: none"> <li>Visual quality affected by lighting provision of the development during operation at night.</li> </ul>
VO-04	<ul style="list-style-type: none"> <li>Visual obstruction by loss of some greenery.</li> </ul>
VO-05	<ul style="list-style-type: none"> <li>Visual obstruction by blockage to open sea view.</li> </ul>
VO-06	<ul style="list-style-type: none"> <li>Waste transportation traffic along access road to/from the WENT Landfill.</li> </ul>

## 10a.8 Landscape Impact Assessment (Before Mitigation)

### 10a.8.1 Sensitivity of Landscape Resources and Landscape Character Areas

10a.8.1.1 Based on the findings of the baseline study, the “Sensitivity” of the identified LRs and LCAs is assessed and listed in **Table 10a.9**.

**Table 10a.9 Sensitivity of Identified Landscape Resources and Landscape Character Areas**

Landscape Resources/ Landscape Character Areas	Ability to Accommodate Change (Low, Medium, High)	Importance (local, regional, national, global)	Rarity (Low, Medium, High)	Quality of Resource (Low, Medium, High)	Maturity of Resource (Mature, Pre-mature)	Sensitivity (Low, Medium, High)
<b>Landscape Resources</b>						
LR1 Ash Lagoon & Trees	<ul style="list-style-type: none"> <li>Naturalness is low due to its conversion into a man-made dumping ground with frequent disturbance from CLP’s PFA &amp; dredging activities at the lagoons.</li> <li>Although site formation works would be carried out at the northern part of the Middle Lagoon, this LR has been previously disturbed by human activities, and its ability to accommodate change is medium.</li> <li>A number of grasses, creepers, groundcovers, and small shrubs have grown. Larger shrubs and even small trees, such as <i>Macaranga tanarius</i> and <i>Leucaena leucocephala</i>, are found. The trees are mature. None of them are of high landscape value.</li> <li>Floral diversity is low (29 species).</li> <li>The landscape value / quality for this landscape resource is considered to be low.</li> </ul>					Medium
	Medium	Local	Medium	Low	Mature	
LR2 Seashore	<ul style="list-style-type: none"> <li>The seashore is an artificial seawall made up of sloping boulders, already intervened by human. The naturalness is hence low.</li> <li>Its ability to accommodate change is high.</li> <li>Some plants (e.g. <i>Celtis sinensis</i>, <i>Lantana camara</i> and <i>Ficus virens</i>) are found. They are of common species and of low landscape value.</li> </ul>					Low
	High	Local	Low	Low	Mature	
LR3 Tidal Stream	<ul style="list-style-type: none"> <li>The stream is a semi-natural to man-made water channel, collecting water from its tributaries that run down from the valleys of Castle Peak, and draining the water from west to east towards the Deep Bay.</li> <li>Wild vegetation and occasional trees are found along the banks of the water channel.</li> </ul>					Medium
	Medium	Local	Low	Medium	Mature	

Landscape Resources/ Landscape Character Areas	Ability to Accommodate Change (Low, Medium, High)	Importance (local, regional, national, global)	Rarity (Low, Medium, High)	Quality of Resource (Low, Medium, High)	Maturity of Resource (Mature, Pre-mature)	Sensitivity (Low, Medium, High)
LR4 Woodland & Shrubland	<ul style="list-style-type: none"> <li>The woodland is located to the south of the project site and the shrubland is located close to the water channel located to the north of this LR. In the woodland, there are signs of previous human activities, such as a building structure, paved / unpaved roads, concrete platform. The shrubland is sparse with low species diversity.</li> <li>The woodland and shrubland are mature. The trees found in this LR are common species, such as <i>Celtis sinensis</i>, <i>Leucaena leucocephala</i>, <i>Ligustrum sinense</i>, <i>Macaranga tanarius</i>, <i>Microcos paniculata</i>, <i>Rhus spp.</i>, <i>Sterculia lanceolata</i>, etc. Trees are scattered around this LR and takes up about 60% of the 8.8 ha of land of this LR.</li> <li>Floral diversity is not high.</li> <li>Separated by LR3 and LR5, this LR is detached from the project site.</li> </ul>					Medium
	Medium	Local	Medium	Medium	Mature	
LR5 Vegetated Slope	<ul style="list-style-type: none"> <li>The LR consists of approx. 32.5 ha of man-made slopes (cut slopes) with reinstated plantation and the hillside, disturbed areas with naturally grown vegetation.</li> <li>Trees of common species, mostly <i>Macaranga tanarius</i> and <i>Leucaena leucocephala</i>, are scattered around this LR, taking up more than 50% of the total area of this LR. The trees are mature in general. No rare species are recorded.</li> <li>Floral diversity is not high.</li> </ul>					Low
	Medium	Local	Low	Low	Mature	
LR6 Landfill	<ul style="list-style-type: none"> <li>This LR refers to existing the WENT Landfill, which is highly disturbed by human activities. Its ability to accommodate change is hence high.</li> </ul>					Low
	High	Local	Medium	Low	Mature	
LR7 Seawater of Nim Wan	<ul style="list-style-type: none"> <li>This LR refers to the Deep Bay to the north of the project site. It is a natural resource, and at the same time in close proximity to one of the busiest shipping lanes in Hong Kong.</li> <li>Due to large quantity of seawater in the local area, this resource is not rare.</li> <li>The landscape quality and value is considered medium.</li> </ul>					Medium
	Medium	Local	Low	Medium	N/A	
LR8 Factories	<ul style="list-style-type: none"> <li>This LR is completely intervened by man-made structures, such as grease treatment plant, storage tanks, etc.</li> <li>There are some planting strips in this region.</li> </ul>					Low
	High	Local	Low	Low	Mature	
LR9 Temple Structure	<ul style="list-style-type: none"> <li>Surrounded by the dense woodland, there are traces of destroyed structures. The only building structure exists is the Hung Shing and Dragon Mother Temple.</li> <li>The temple is a single-storey, two-room building structure. It was re-built in 1980s with cement mortar &amp; steel after fire damage. The landscape value of the temple is considered low.</li> <li>Separated by LR4, this LR is detached from the project site.</li> </ul>					Medium
	Medium	Local	Medium	Medium	Mature	

<b>Landscape Resources/ Landscape Character Areas</b>	<b>Ability to Accommodate Change</b> (Low, Medium, High)	<b>Importance</b> (local, regional, national, global)	<b>Rarity</b> (Low, Medium, High)	<b>Quality of Resource</b> (Low, Medium, High)	<b>Maturity of Resource</b> (Mature, Pre-mature)	<b>Sensitivity</b> (Low, Medium, High)
<b>Landscape Character Areas</b>						
LCA1 Ash Lagoon	<ul style="list-style-type: none"> <li>The ash lagoon is frequently disturbed by PFA and dredging activities.</li> <li>It is characterized by its wasteland nature with vegetation of common species.</li> <li>It has low species diversity.</li> <li>It is capable to accommodate change due to its frequent disturbance by human activities.</li> </ul>					Medium
	Medium	Local	Medium	Low	Mature	
LCA2 Landfill Landscape	<ul style="list-style-type: none"> <li>This LCA is characterized by its industrial environment and is capable to accommodate change.</li> </ul>					Low
	High	Local	Low	Low	Mature	
LCA3 Abandoned Village	<ul style="list-style-type: none"> <li>A small portion at the southwest part of this LCA is an archaeological site with limited ability to accommodate change.</li> <li>A large portion of this LCA is covered by woodland with common plant species.</li> <li>The temple (with about 50 years history) and graves are of low to medium landscape value.</li> </ul>					Medium
	Medium	Local	Medium	Medium	Mature	
LCA4 Barren Hillside	<ul style="list-style-type: none"> <li>Common plant species of low landscape value are found in the vegetated slope (LR5).</li> </ul>					Low
	Medium	Local	Low	Low	Mature	
LCA5 Inter-tidal coastal landscape	<ul style="list-style-type: none"> <li>The LCA covers the Deep Bay to the north of the project site and the artificial seawall in the form of sloping boulders. The extent of this LCA is extensive comparing with the extent of the proposed works. This LCA is a combination of the natural seawater (LR7), which forms a large portion of this LCA, and the artificial seawall (LR2), which is already intervened by human and of low naturalness.</li> <li>The landscape quality and value of the LCA is considered medium.</li> </ul>					Medium
	Medium	Local	Low	Medium	N/A	

### 10a.8.2 Magnitude of Change of Landscape Resources and Landscape Character Areas

10a.8.2.1 The “Magnitude of Change” of the identified LRs and LCAs is assessed and listed in Table 10a.10.

**Table 10a.10 Magnitude of Change of Identified Landscape Resources and Landscape Character Areas**

	Landscape Resources/ Landscape Character Areas	Physical Extent & Landscape Context of Impact	Magnitude of Change (Negligible, Small, Intermediate, Large)	
			Construction	Operation
<b>Landscape Resources</b>				
LR1	Ash Lagoon & Trees	<p><u>Source of Impact (Construction Phase)</u></p> <ul style="list-style-type: none"> <li>LC-01, LC-02, LC-03, LC-04, LC-05, LC-06, LC-07, LC-08</li> </ul> <p><u>Source of Impact (Operation Phase)</u></p> <ul style="list-style-type: none"> <li>LO-01, LO-02, LO-03, LO-04</li> </ul> <p><u>Physical Extent</u></p> <ul style="list-style-type: none"> <li>The Project would require decommissioning of the Middle Lagoon. Site formation works including clearance of boulders and subsequent backfilling of site would be carried out in the Middle Lagoon, forming about 11 hectares of land (about 25% of LR1), followed by foundation works.</li> <li>Followed by foundation works, the associated roads and drains, superstructures building and installation of plant and equipment for the various systems will be constructed in the project area.</li> <li>Road works connecting the STF site will be carried out outside the project area, which is located along the northern side of this LCA.</li> </ul> <p><u>Compatibility with surrounding landscape</u></p> <ul style="list-style-type: none"> <li>23 nos. of trees of common species would need to be transplanted at the middle lagoon where the project work is situated. However, their chance of survival during on-site transplantation would be low.</li> <li>Currently, the land has been largely formed by PFA that was filled to this site in the previous years. As there is no existing structure in the site area, the works related to the decommissioning of the lagoon would be minimal.</li> <li>The finished ground level of the IWMF will be at a level higher than the average ground level of the existing Middle Lagoon. Therefore, the forming of the land for the IWMF would involve mainly filling and levelling work. No disposal of PFA will be required during the construction phase.</li> <li>As the STF will be constructed adjacent to this site before the commencement of this Project, the development of the IWMF at the Middle Lagoon is considered compatible with the surrounding context.</li> </ul> <p><u>Duration of impact</u></p> <ul style="list-style-type: none"> <li>The duration of impact imposed during the construction (approximately 3 years) and operation phases is long.</li> </ul>	Large	Large

	Landscape Resources/ Landscape Character Areas	Physical Extent & Landscape Context of Impact	Magnitude of Change (Negligible, Small, Intermediate, Large)	
			Construction	Operation
		<u>Reversibility of Change</u> <ul style="list-style-type: none"> <li>The impact is considered permanent and irreversible.</li> </ul>		
LR2	Seashore	<ul style="list-style-type: none"> <li>Located outside works area; no direct/physical impact.</li> <li>No pier would be constructed along this LR as waste will be transported to the existing berth of the WENT Landfill by marine transport, and then to the IWMF by land transport.</li> </ul>	Negligible	Negligible
LR3	Tidal Stream	<ul style="list-style-type: none"> <li>Located outside works area; no direct/physical impact.</li> </ul>	Negligible	Negligible
LR4	Woodland & Shrubland	<ul style="list-style-type: none"> <li>Located outside works area; no direct/physical impact.</li> </ul>	Negligible	Negligible
LR5	Vegetated Slope	<ul style="list-style-type: none"> <li>Located outside works area; no direct/physical impact.</li> </ul>	Negligible	Negligible
LR6	Landfill	<ul style="list-style-type: none"> <li>Located outside works area; no direct/physical impact.</li> </ul>	Negligible	Negligible
LR7	Seawater of Nim Wan	<ul style="list-style-type: none"> <li>Located outside works area; no direct/physical impact.</li> </ul>	Negligible	Negligible
LR8	Factories	<ul style="list-style-type: none"> <li>Located outside works area; no direct/physical impact.</li> </ul>	Negligible	Negligible
LR9	Temple Structure	<ul style="list-style-type: none"> <li>Located outside works area; no direct/physical impact.</li> </ul>	Negligible	Negligible
<b>Landscape Character Areas</b>				
LCA1	Ash Lagoon	<u>Source of Impact (Construction Phase)</u> <ul style="list-style-type: none"> <li>LC-01, LC-02, LC-03, LC-04, LC-05, LC-06, LC-07, LC-08</li> </ul> <u>Source of Impact (Operation Phase)</u> <ul style="list-style-type: none"> <li>LO-01, LO-02, LO-03, LO-04</li> </ul> <u>Physical Extent</u> <ul style="list-style-type: none"> <li>The Project would require decommissioning of the Middle Lagoon. Site formation works including clearance of boulder, and subsequent backfilling of site would be carried out in the Middle Lagoon, forming about 11 hectares of land (about 25% of LR1)</li> <li>Followed by foundation works, the associated roads and drains, superstructures building and installation of plant and equipment for the various systems will be constructed in the project area.</li> <li>Road works connecting the STF site will be carried out outside the project area, which is located along the northern side of this LCA.</li> </ul> <u>Compatibility with Surrounding Landscape</u> <ul style="list-style-type: none"> <li>No pier would be constructed along shoreline as waste will be transported to the existing berth of the WENT Landfill by marine transport, and then to the IWMF by land transport.</li> <li>23 nos. of trees of common species would need to be transplanted at the Middle Lagoon where the project work is situated. However, their chance of survival during on-site transplantation would be low.</li> <li>Currently, the land has been largely formed by PFA that was filled to this site in the previous years. As there is no existing structure in the site area, the works related to the</li> </ul>	Large	Large

	Landscape Resources/ Landscape Character Areas	Physical Extent & Landscape Context of Impact	Magnitude of Change (Negligible, Small, Intermediate, Large)	
			Construction	Operation
		decommissioning of the lagoon would be minimal. <ul style="list-style-type: none"> <li>The finished ground level of the IWMF will be at a level higher than the average ground level of the existing Middle Lagoon. Therefore, the forming of the land for the IWMF would involve mainly filling and levelling work. No disposal of PFA will be required during the construction phase.</li> <li>As the STF will be constructed adjacent to this site before the commencement of this Project, the development of the IWMF at the Middle Lagoon is considered compatible with the surrounding context.</li> </ul> <u>Duration of impact</u> <ul style="list-style-type: none"> <li>The duration of impact imposed during the construction (approximately 3 years) and operation phases is long.</li> </ul> <u>Reversibility of Change</u> <ul style="list-style-type: none"> <li>The impact is considered permanent and irreversible.</li> </ul>		
LCA2	Landfill Landscape	Located outside works area; no direct/physical impact.	Negligible	Negligible
LCA3	Abandoned Village	Located outside works area; no direct/physical impact.	Negligible	Negligible
LCA4	Barren Hillside	Located outside works area; no direct/physical impact.	Negligible	Negligible
LCA5	Inter-tidal Coast Landscape	Located outside works area; no direct/physical impact.	Negligible	Negligible

### 10a.8.3 Significance Threshold of Landscape Resources and Landscape Character Areas

10a.8.3.1 Based on the “Sensitivity” as listed in **Table 10a.9** and “Magnitude of Change” as listed in **Table 10a.10**, the degree of significance for LRs and LCAs is identified according to the matrix **Table 10a.1**. The Significance Threshold of identified LRs and LCAs before mitigation is assessed and listed in **Table 10a.11**.

**Table 10a.11 Significance Threshold of Identified Landscape Resources and Landscape Character Areas before Mitigation**

	Landscape Resources/ Landscape Character Areas	Sensitivity	Source of Impact		Magnitude of Change Before Mitigation		Impact Significance Threshold Before Mitigation	
			Construction	Operation	Construction	Operation	Construction	Operation
<b>Landscape Resources</b>								
LR1	Ash Lagoon & Trees	Medium	LC-01 LC-02 LC-03 LC-04 LC-05 LC-06 LC-07 LC-08	LO-01 LO-02 LO-03 LO-04	Large	Large	Substantial	Substantial
LR2	Seashore	Low	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LR3	Tidal Stream	Medium	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LR4	Woodland & Shrubland	Medium	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LR5	Vegetated Slope	Low	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LR6	Landfill	Low	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LR7	Seawater of Nim Wan	Medium	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LR8	Factories	Low	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LR9	Temple Structure	Medium	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
<b>Landscape Character Area</b>								
LCA1	Ash Lagoon	Medium	LC-01 LC-02 LC-03 LC-04 LC-05 LC-06 LC-07 LC-08	LO-01 LO-02 LO-03 LO-04	Large	Large	Substantial	Substantial
LCA2	Landfill Landscape	Low	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LCA3	Abandoned Village	Medium	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LCA4	Barren Hillside	Low	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial
LCA5	Inter-tidal Coast Landscape	Medium	Nil	Nil	Negligible	Negligible	Insubstantial	Insubstantial

## 10a.9 Visual Impact Assessment

### 10a.9.1 Sensitivity of Visual Sensitive Receivers

10a.9.1.1 Based on the findings of the baseline study, the characteristics and “Sensitivity” of the identified VSRs are summarized in **Table 10a.12**.

**Table 10a.12 Sensitivity of Identified Visual Sensitive Receivers**

I.D. no.	VSRs	Type of VSRs	No. of Individuals (Many, Medium, Few, Very Few)	Quality of Existing View (Good, Fair, Poor)	Availability of Alternative Views (Yes/No)	Degree of Visibility (Full, Partial, Glimpse)	Frequency of View (Very Frequent, Frequent, Occasional, Rare)	Sensitivity (Low, Medium, High)
VSR1	<ul style="list-style-type: none"> <li>The VSR consists of workers who maintain and repair the pipe ducts and drainage systems on the slope to the southeast of the Middle Lagoon.</li> <li>The maintenance access used by the workers located uphill is restricted.</li> <li>While the view of the project site is screened off by the heavy vegetation at the ground level, the project site becomes visible to this VSR as they walk uphill along the maintenance access. At about 10m above the ground level, the full view of the project site can be seen by this VSR.</li> </ul>							Medium
	Footpath Uphill	Occupational	Few	Good	Yes	Full	Occasional	
VSR2	<ul style="list-style-type: none"> <li>This VSR refers to the travellers who travel along Nim Nam Road to/from the ash lagoon area or the WENT Landfill. As both the WENT Landfill and the ash lagoon area are restricted area, the VSR is primarily dump truck drivers transporting waste to the WENT Landfill, operators of the WENT Landfill and workers in the ash lagoon area. Pedestrians are rarely present.</li> <li>The building structures in the project site are screened off by the trees along the roadside. Only a portion of the chimney would be visible to this VSR.</li> </ul>							Low
	Nim Wan Road	Traveller	Few	Fair	Yes	Glimpse	Occasional	
VSR3	<ul style="list-style-type: none"> <li>This VSR consists of the workers operating the STF and the visitors visiting the Environmental Education Centre (EEC) at STF.</li> <li>The STF workers would carry out indoor works in most circumstances.</li> <li>The visitors to EEC would have a good view of the architectural and landscape design of the IWMF being coherent with the STF, and the development of the two facilities would be integrated and blended well with each other.</li> <li>There are alternative views with high amenity value to this VSR.</li> </ul>							Medium
	Sludge Treatment Facilities	Occupational & Visitors	Medium	Fair	Yes	Full	Frequent	

I.D. no.	VSRs	Type of VSRs	No. of Individuals (Many, Medium, Few, Very Few)	Quality of Existing View (Good, Fair, Poor)	Availability of Alternative Views (Yes/No)	Degree of Visibility (Full, Partial, Glimpse)	Frequency of View (Very Frequent, Frequent, Occasional, Rare)	Sensitivity (Low, Medium, High)
VSR4	<ul style="list-style-type: none"> <li>This VSR includes the sea travelers travelling in the Deep Bay to/from Shekou, workers on vessels carrying waste containers to the WENT Landfill, and workers on fishing vessels.</li> <li>In normal situations, ships would not sail close to the site.</li> <li>Owing to the vast and exposed site, the proposed works will be visible by the VSR in a significant way, especially the presence of the high-rise stacks.</li> <li>There are alternative views with high amenity value to this.</li> </ul>							
	Sea of Deep Bay	Sea traveller & Occupational	Medium	Good	Yes	Full	Occasional	High
VSR5	<ul style="list-style-type: none"> <li>This VSR refers to the residents &amp; visitors at Ha Pak Lai, located about 2km to the east of the project site.</li> <li>As there is a significant distance between the project site and the village, most of the proposed works will be barely seen by the VSR.</li> <li>The vista to the proposed works would be marginally blocked by the STF to the east of the project site.</li> </ul>							
	Ha Pak Lai	Residential & Visitors	Medium	Good	Yes	Partial	Frequent	High
VSR6	<ul style="list-style-type: none"> <li>This VSR refers to the operators of the Black Point Power Station, located to the southwest of the project site.</li> <li>The VSR's view of the buildings in the project site will be fully blocked by the existing slope (range from 20-100mPD) to the northeast of this VSR. Only a portion of the chimney will be visible to this VSR.</li> </ul>							
	Black Point Power Station	Occupational	Few	Fair	Yes	Partial	Occasional	Low

### 10a.9.2 Magnitude of Change of Visual Sensitive Receivers

10a.9.2.1 The “Magnitude of Change” of the identified VSRs is assessed and listed in **Table 10a.13**.

**Table 10a.13 Magnitude of Change of Identified Visual Sensitive Receivers**

I.D. no.	VSRs	Source of Impact		Compatibility (Good, Fair, Poor)	Duration of Impacts (Very Frequent, Frequent, Occasional, Rare)	Reversibility of Change (Yes, No)	Scale of Impact (Large, Medium, Small)	Viewing Distance (m)	Potential Blockage of View (Full, Partial, Glimpse)	Magnitude of Change (Large, Intermediate, Small, Negligible)	
		Construction	Operation							Construction	Operation
VSR1	Footpath Uphill	VC-01 VC-02 VC-03 VC-04	VO-01 VO-02 VO-03 VO-04 VO-05	Fair	Occasional	No	Medium	300	Full	Intermediate	Intermediate
VSR2	Nim Wan Road	VC-01	VO-01 VO-03	Fair	Occasional	No	Large	200	Glimpse	Negligible	Negligible
VSR3	Sludge Treatment Facilities	VC-01 VC-02 VC-03 VC-04	VO-01 VO-02 VO-03 VO-04 VO-06	Fair	Frequent	No	Medium	10	Full	Intermediate	Intermediate
VSR4	Sea of Deep Bay	VC-01 VC-03 VC-04	VO-01 VO-02 VO-03 VO-04 VO-06	Fair	Occasional	No	Large	100	Full	Large	Large
VSR5	Ha Pak Lai	VC-01 VC-03 VC-04	VO-01 VO-02 VO-03 VO-04 VO-06	Fair	Frequent	No	Medium	2000	Partial	Intermediate	Intermediate
VSR6	Black Point Power Station	VC-01	VO-01 VO-03	Fair	Occasional	No	Medium	700	Partial	Small	Small

### 10a.9.3 Significance Threshold of Visual Sensitive Receivers

10a.9.3.1 Based on the “Sensitivity” as listed in **Table 10a.12** and “Magnitude of Change” as listed in **Table 10a.13**, the degree of significance for VSRs is identified according to the matrix shown in **Table 10a.1**. The Significance Threshold of the VSRs before mitigation is assessed and listed in **Table 10a.14**.

**Table 10a.14 Significance Threshold of Identified Visual Sensitive Receivers before Mitigation**

I.D. no.	VSRs	Source of Impact		Sensitivity	Magnitude of Change Before Mitigation		Impact Significance Threshold Before Mitigation	
		Construction	Operation		Construction	Operation	Construction	Operation
VSR1	Footpath Uphill	VC-01 VC-02 VC-03 VC-04	VO-01 VO-02 VO-03 VO-04 VO-05	Medium	Intermediate	Intermediate	Moderate	Moderate
VSR2	Nim Wan Road	VC-01	VO-01 VO-03	Low	Negligible	Negligible	Insubstantial	Insubstantial
VSR3	Sludge Treatment Facilities	VC-01 VC-02 VC-03 VC-04	VO-01 VO-02 VO-03 VO-04 VO-06	Medium	Intermediate	Intermediate	Moderate	Moderate
VSR4	Sea of Deep Bay	VC-01 VC-03 VC-04	VO-01 VO-02 VO-03 VO-04 VO-06	High	Large	Large	Substantial	Substantial
VSR5	Ha Pak Lai	VC-01 VC-03 VC-04	VO-01 VO-02 VO-03 VO-04 VO-06	High	Intermediate	Intermediate	Moderate/ Substantial	Moderate/ Substantial
VSR6	Black Point Power Station	VC-01	VO-01 VO-03	Low	Small	Small	Slight	Slight

## **10a.10 Mitigation Measures**

### **10a.10.1 Mitigation Measure Approaches**

10a.10.1.1 The identification of the landscape and visual impacts highlights the potential primary sources of impacts and their magnitude of change caused to LR/LCAs/VSRs. Corresponding mitigation measures are proposed to avoid and reduce the identified sources of impacts, and to remedy and compensate unavoidable impact. The potential landscape and visual enhancement is also considered in the proposed mitigation measures.

### **10a.10.2 General Mitigation Measures / Strategies**

10a.10.2.1 Minimization of the structure size is an important strategy to alleviate the visual impact. In the design of the building heights and dimensions, the potential visual impact should be taken into consideration in addition to the engineering and other environmental factors. A balance should be struck between a smooth operation of the facilities and minimization of various environmental impacts. In determination of the height of the stack, it is important to alleviate the potential air quality impacts at critical ASRs, while not to result in significant visual intrusion. To determine the optimal height of the stack, wind tunnel tests that consisted of plume visualization were conducted for the stacks in various heights. The stack height of 150m was a balanced solution considering the air quality impacts at critical ASRs and the potential visual impact. For the other structures of the IWMF, their heights and dimensions should be designed with due consideration of requirements to accommodate the necessary equipment and the effective use of land and in order to minimize their size. In this reference design, instead of providing one bulky building at the same height to house all the equipment, structures with different building heights are designed to suit the specific needs of the equipment. The tallest part of the incineration plant is where the incinerators (about 50m) are accommodated, while the other part of the incineration plant and other structures are designed to be at lower heights.

10a.10.2.2 The proposed mitigation measures shall also take into consideration the future developments in the vicinity of the proposed works to enhance the compatibility with the surrounding environment and improve the overall landscape and visual quality. Currently, the Sludge Treatment Facilities (STF) has been confirmed to be developed to the east of the TTAL site and will start commissioning before the IWMF. The STF is modern incineration plant treating sludge generated from sewage treatment works. The STF has a contemporary design integrated with landscape features such as green roof and landscape areas. With the architectural and landscape design of the IWMF being coherent with the adjacent STF, the development of the two facilities could be integrated and blend well in the surrounding landscape. The two developments would form a harmonic view, and the cumulative landscape and visual impact of the two developments would be alleviated.

10a.10.2.3 About 27 nos. of trees would be affected by the proposed works. As all the affected trees were with low survival rate after transplanting, these trees are recommended to be felled. Implementation of compensatory planting for heavy standard trees will be of a ratio not less than 1:1 according to tree quantity and total tree trunk diameter lost. The required numbers and locations of compensatory trees would be determined and agreed with Government during the tree felling application process under ETWB TCW 3/2006.

10a.10.2.4 It is expected that the heavy standard trees would create immediate greening effect. As the affected trees, which are of low amenity value, would be replaced by heavy standard

trees, the proposed mitigation measures would not only alleviate the impact due to the project, but also enhance the existing landscape.

10a.10.2.5 The recommended mitigation measures, which are applicable to individual LR, LCA and VSR, are tabulated in **Table 10a.15**. The locations where the recommended mitigation measures to be implemented are shown in the Landscape & Visual Mitigation Measures Plan (**Figure 10a.9**) for reference.

10a.10.2.6 The mitigation measures during construction will be implemented from the commencement of the works and shall be applied for the whole duration of the construction period. The mitigation measures during operation will be included in the detailed design and shall be constructed or built up during the construction period. Management and maintenance for all mitigation measures will follow ETWB TCW No. 2/2004 Maintenance of Vegetation and Hard Landscape Features.

10a.10.2.7 In terms of the funding, implementation, management and maintenance of the recommended mitigation measures, the Environmental Protection Department will be the responsible agent. The mitigation measures are considered practical and feasible.

**Table 10a.15 Recommended Landscape and Visual Mitigation Measures**

ID. No.	Landscape and Visual Mitigation Measure
<b><i>During Construction Phase</i></b>	
<b><i>Mitigation for both Landscape &amp; Visual Impacts</i></b>	
MLVC-01	Grass-hydroseeded bare soil surface.
MLVC-02	<p><u>Provision of Water Pond as Habitat for Little Grebe</u>                      A compensatory habitat for Little Grebe will be provided as an ecological mitigation measure for the loss of habitat within the project site. This compensatory habitat, which would be a landscape area with water pond and plants, is also considered as a landscape mitigation measure for the loss of ash lagoon. The final design of the habitat will be determined in the Habitat Creation and Management Plan. The compensatory habitat as shown in <b>Figure 10a.9</b> and the photomontages is for illustration purpose.</p>
MLVC-03	<p><u>Existing Trees Preservation within Works Areas</u>                      No trees should be felled or transplanted unless they are inevitably affected by the proposed works. Affected trees should be transplanted under circumstance where technically feasible. A tree survey report should be prepared and a tree felling application should be submitted to Government during the detailed design stage for approval before the site formation works commence. The numbers, locations, species and sizes of the trees to be transplanted or felled should be clearly addressed. All existing trees within work sites shall be properly maintained and protected for their crowns, trunks and roots.</p>
MLVC-04	<p><u>Transplanting of Trees to Adjacent Locations</u>                      The existing trees recommended to be transplanted shall be directly transplanted to other locations in vicinity where no construction will take place.                      The construction programme should also allow sufficient time for root pruning and rootball preparation prior to transplanting.</p>
MLVC-05	<p><u>Compensatory Landscape Planting</u>                      Implementation of compensatory planting with heavy standard trees shall be of a ratio not less than 1:1 according to tree quantity and total tree trunk diameter lost.</p>

ID. No.	Landscape and Visual Mitigation Measure
MLVC-06	<p><u>Landscape Design</u></p> <ol style="list-style-type: none"> <li>1) Early planting using fast grow trees and tall shrubs at strategic locations within site will be implemented to block view corridors to the site from the VSRs, and to locally screen haul roads, excavation works and site preparation works.</li> <li>2) Tree species of dense tree crown will be used to serve as visual barrier.</li> <li>3) Hard and soft landscape treatment (e.g. trees and shrubs) of open areas within development will be implemented to provide shade and shelter and a green appearance from surrounding viewpoints.</li> <li>4) Planting strip would be provided along the periphery of the project site.</li> <li>5) Selected plant species should be suitable for coastal condition.</li> </ol>
MLVC-07	<p><u>Reuse Existing Boulders</u></p> <p>Boulders cleared from the ash lagoon during site formation will be reserved and used as part of the landscape design to preserve its “natural look”.</p>
MLVC-08	<p><u>Greening Design (Rooftop &amp; Vertical Greening)</u></p> <ol style="list-style-type: none"> <li>1) Rooftop and vertical greening (vertical building envelope) shall be implemented to increase the amenity value of the proposed works, moderate temperature extremes and enhance building energy performance, as well as visually improve the development.</li> <li>2) Vertical greening shall be implemented for the lower portion of chimney (~20-25m high).</li> </ol>
<b>Mitigation for Visual Impacts</b>	
MVC-01	<p><u>Visual Mitigation and Aesthetic Design</u></p> <ol style="list-style-type: none"> <li>1) Recessive colour tone is proposed for the façade of the ancillary facility buildings (e.g. incinerator plant) to blend in with the nature.</li> <li>2) Architectural feature (e.g. light weight aluminum structure) is incorporated with the tapered chimney of recessive colour tone to diminish its “chimney like” appearance.</li> <li>3) Stone as a natural material is proposed at the lower portion of the building façade and the chimney to compliment with the surrounding environment.</li> <li>4) Change of material at different portions of the building helps to reduce the bulkiness.</li> <li>5) Green roof structure (with irrigation and drainage system) in curvilinear strips is proposed to cover the rectilinear building bulk. Roof strips of different curvatures are further broken down to echo with the contour of the hillside slope behind.</li> </ol>
MVC-02	Security floodlight for construction areas shall be controlled at night to avoid excessive glare to the surrounding receiver.
MVC-03	The construction sequence and construction programme shall be optimized in order to minimize the duration of impact.
MVC-04	The backfilling materials for site formation & construction materials / wastes on site shall be stored at a maximum height of 2m and covered with an impermeable material of visually un-obtrusive material (in earth tone).
MVC-05	The number of construction traffic to / from the project site shall be maintained to practical minimum.
<b>During Operation Phase</b>	
<b>Mitigation for Landscape Impacts</b>	
MLO-01	<p><u>Planting Maintenance</u></p> <p>Proper planting maintenance and replacement of defective plant species on the new planting areas to enhance aesthetic and landscape quality shall be provided.</p>
<b>Mitigation for Visual Impacts</b>	
MVO-01	<p><u>Environmental Education Centre to Promote Waste Reduction</u></p> <p>An Environmental Education Center, in which regular exhibitions and lectures to promote environmental awareness and waste reduction concept would be provided, shall be developed as a part of the IWMMF for the general public to alleviate negative public perceptions of the development.</p>

ID. No.	Landscape and Visual Mitigation Measure
MVO-02	<u>Control of Light</u> The numbers of lights and their intensity shall be controlled to a level good enough to meet the safety requirements at night but not excessive.
MVO-03	<u>Control of Operation Time</u> The frequency of waste transportation shall be minimized to practical minimum (e.g. limit the reception of MSW from 8 am to 8 pm).

### 10a.10.3 Residual Impact of Landscape Resources and Landscape Character Areas

10a.10.3.1 The residual impact of each LCA and LR regarding the significance threshold after mitigation is summarized in **Table 10a.16**.

**Table 10a.16 Residual Impact of Identified Landscape Resources and Landscape Character Areas after Mitigation**

I.D. no.	LRs / LCAs	Recommended Mitigation Measures		Residual Impact Significance Threshold after Mitigation		
		Construction	Operation	Construction	Operation	
					Day 1	Year 10
<b>Landscape Resource</b>						
LR1	Ash Lagoon & Trees	MLVC-01, MLVC-02, MLVC-03, MLVC-04, MLVC-05, MLVC-06, MLVC-07, MLVC-08	MLO-01	Moderate	Slight	Slight
LR2	Seashore	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LR3	Tidal Stream	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LR4	Woodland & Shrubland	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LR5	Vegetated Slope	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LR6	Landfill	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LR7	Seawater of Nim Wan	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LR8	Factories	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LR9	Temple Structure	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
<b>Landscape Character Area</b>						
LCA1	Ash Lagoon	MLVC-01, MLVC-02, MLVC-03, MLVC-04, MLVC-05, MLVC-06, MLVC-07, MLVC-08	MLO-01	Moderate	Slight	Slight
LCA2	Landfill Landscape	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LCA3	Abandoned Village	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LCA4	Barren Hillside	Nil	Nil	Insubstantial	Insubstantial	Insubstantial
LCA5	Inter-tidal Coast Landscape	Nil	Nil	Insubstantial	Insubstantial	Insubstantial

### 10a.10.4 Residual Impact of Visual Sensitive Receivers

10a.10.4.1 The residual impact of each VSR regarding the significance threshold after mitigation is summarized in **Table 10a.17**.

**Table 10a.17 Residual Impact of Identified Visual Sensitive Receivers after Mitigation**

I.D. no.	VSRs	Recommended Mitigation Measures		Residual Impact Significance Threshold after Mitigation		
		Construction	Operation	Construction	Operation	
					Day 1	Year 10
VSR1	Footpath Uphill	MLVC-01, MLVC-02, MLVC-03, MLVC-04, MLVC-05, MLVC-06, MLVC-07, MLVC-08, MVC-01, MVC-02, MVC-03, MVC-04, MVC-05	MVO-01, MVO-02, MVO-03, MLO-01	Slight / Moderate	Slight / Moderate	Slight
VSR2	Nim Wan Road	MVC-01, MVC-02, MVC-03	MVO-01, MVO-02	Insubstantial	Insubstantial	Insubstantial
VSR3	Sludge Treatment Facilities	MLVC-01, MLVC-02, MLVC-03, MLVC-04, MLVC-05, MLVC-06, MLVC-07, MLVC-08, MVC-01, MVC-02, MVC-03, MVC-04, MVC-05	MVO-01, MVO-02, MVO-03, MLO-01	Slight / Moderate	Slight / Moderate	Slight
VSR4	Sea of Deep Bay	MLVC-01, MLVC-02, MLVC-03, MLVC-04, MLVC-05, MLVC-06, MLVC-07, MLVC-08, MVC-01, MVC-02, MVC-03, MVC-04, MVC-05	MVO-01, MVO-02, MVO-03, MLO-01	Moderate / Substantial	Moderate	Slight / Moderate
VSR5	Ha Pak Lai	MLVC-01, MLVC-02, MLVC-03, MLVC-04, MLVC-05, MLVC-08, MVC-01, MVC-02, MVC-03	MVO-01, MVO-02, MVO-03, MLO-01	Moderate	Moderate	Slight / Moderate
VSR6	Black Point Power Station	MVC-01, MVC-02, MVC-03	MVO-01, MVO-02	Insubstantial	Insubstantial	Insubstantial

### 10a.10.5 Photomontages of Residual Impact of Visual Sensitive Receivers

10a.10.5.1 **Table 10a.18** shows the visibility of the VSRs to the proposed works. Photomontages for illustration are provided accordingly.

**Table 10a.18 Visibility of Visual Sensitive Receivers to Proposed Works**

I.D. no.	VSRs	Figure of Photomontage	Visibility of VSR to Proposed Works
VSR1	Footpath Uphill	Figures 10a.10 to 10a.13	<ul style="list-style-type: none"> <li>VSR1 has a full view of the proposed works without blockage.</li> </ul>
VSR2	Nim Wan Road	Nil	<ul style="list-style-type: none"> <li>VSR2's view of the proposed works will be mostly blocked by the trees along the roadside.</li> </ul> <p>(As the proposed works will be barely seen by this VSR and the visual impact is insubstantial, the corresponding photomontages are not provided.)</p>

I.D. no.	VSRs	Figure of Photomontage	Visibility of VSR to Proposed Works
VSR3	Sludge Treatment Facilities	Figures 10a.14 to 10a.17	<ul style="list-style-type: none"> <li>VSR3 has a full view of the proposed works without blockage.</li> </ul>
VSR4	Sea of Deep Bay	Figures 10a.18 to 10a.21	<ul style="list-style-type: none"> <li>VSR4 has a full view of the proposed works without blockage.</li> </ul>
VSR5	Ha Pak Lai	Figures 10a.22 to 10a.25	<ul style="list-style-type: none"> <li>VSR5 has a partial view of the proposed works.</li> </ul>
VSR6	Black Point Power Station	Nil	<ul style="list-style-type: none"> <li>VSR6's view of the proposed works will be mostly blocked by the existing slope to the northeast of the VSR.  (The Black Point Power Station is not accessible by the public. No suitable photo can be used to prepare the photomontages.)</li> </ul>

## 10a.11 Cumulative Impacts

### 10a.11.1 Concurrent Projects near Project Site

10a.11.1.1 **Table 10a.19** lists the concurrent projects in the vicinity of the project site.

**Table 10a.19 Concurrent Projects in the Vicinity of TTAL Site**

Concurrent Projects	Scope of Project
WENT Landfill Extension	<ul style="list-style-type: none"> <li>This project involves development the WENT Landfill Extension (about 200 hectares with capacity of 81Mm<sup>3</sup>).</li> <li>The proposed WENT Landfill Extension will be located to the west of the existing WENT Landfill. It will occupy the West Lagoon and the southern part of the Middle and East Lagoon as well as the area between the Black Point Power Station and the WENT Landfill.</li> <li>The WENT Landfill Extension will be developed in phases. The tentative commencement of the construction works for Phase 1 is 2016/17. The proposed construction works will involve large-scale excavation of soil, change in topography, construction of vehicular road access, operation of large vehicles and machineries, and construction of the associated waste management ancillary facilities. During the operation phase, waste will be spread and compacted after loading from vehicles by waste moving equipment. Spoil mound will be formed from the excavation of the main landfill bowl and will be stored to the Stockpile/ Borrow Area (SBA). Spoil will ultimately be returned to the landfill as daily cover, formation of haul roads and intermediate/ final capping. After the final stage of the construction and operation of the WENT Landfill Extension (tentative schedule to be 2028), the restoration &amp; aftercare phases will take place. The restoration &amp; aftercare works involve final cap construction, landscaping and treatment works within the site to restore the site.</li> <li>The existing landscape resources and landscape characters to be affected by the WENT Landfill Extension are mainly those of disturbed land associated with the SBA and haul roads. The landscape value of the disturbed land is low and its sensitivity is low too. Yet, it is noted that natural vegetation on the hillside to the periphery of the SBA will be affected by the WENT Landfill Extension. Some valuable LCAs (including Inter-tidal Coast Landscape, Upland and Hillside Landscape, Settled Valley Landscape, Coastal Upland and Hillside Landscape) and LRs (including agricultural land, mangrove and swamp, shrubland, grassland, woodland and streams) will be affected in terms of permanent change and loss. The residual impact during construction &amp; operation phases will still be significant.</li> <li>In restoration and aftercare phases, the WENT Landfill Extension will be restored and vegetated to match with its surroundings in terms of landform and vegetation patterns. Loss of landscape</li> </ul>

Concurrent Projects	Scope of Project
	resources and change in landscape characters in construction & operation phases will be compensated and enhanced.
Sludge Treatment Facilities (STF)	<ul style="list-style-type: none"> <li>• The STF is designed to treat 2,000 wet tonnes/day of the dewatered sludge generated after the sewage treatment process by fluidized bed incineration technology.</li> <li>• The STF will be located in the northern part of the East Lagoon, adjacent to the TTAL site for the IWWMF.</li> <li>• The construction commenced in 2010 for completion in 2013. The proposed construction works involve site clearance and formation, piling works, construction of the incineration plant and ancillary facilities, roadwork, and utility installation. During operation phase, there will be presence of incineration plant and ancillary facilities, roadwork and land traffic for sludge transportation.</li> <li>• The development of STF will cause loss of some of the LR and LCA of ash lagoon. The ash lagoon was formed for storage of pulverized fuel ash (PFA) generated from the adjacent power plants. The area is mostly covered with exposed ash, grasses, creepers, groundcovers, shrubs and small trees. Some portions have become marshy with grasses and water ponds. The affected trees in the site area are of low to medium amenity value. The ash lagoon is an uncommon landscape in Hong Kong due to its function. However, the landscape value is considered low. Mitigation measures, such as aesthetic design of the proposed STF matching with adjacent landscape setting of the site, and greening along the site boundary to provide screening and enhance the waterfront area, will be implemented. After the implementation of the mitigation measures, the long-term residual impact to the LR would be reduced to slight.</li> </ul>

### 10a.11.2 Cumulative Impacts

10a.11.2.1 Based on the current programmes of the concurrent projects (the IWWMF, STF and WENT Landfill Extension), the construction of the STF commences first, followed by the construction of the IWWMF and then by the construction of the WENT Landfill Extension. The construction phase of the IWWMF will occur concurrently during the late construction phase and the operation phase of the STF and during the early construction phase of the WENT Landfill Extension. The operation phase of the IWWMF will occur during the operation phase of the STF and the construction, operation, restoration and aftercare phases of the WENT Landfill Extension.

10a.11.2.2 The combined landscape impacts due to the construction and operation of the IWWMF, STF and the WENT Landfill Extension include loss of LCAs (including the Ash Lagoon Landscape, Inter-tidal Coast Landscape, Upland and Hillside Landscape, Settled Valley Landscape, Coastal Upland and Hillside Landscape) and LRs (including ash lagoon, agricultural land, mangrove and swamp, shrubland, grassland, woodland and streams). The impacts will be in terms of permanent change and loss. The magnitude of change due to the construction and operation of the projects, especially the WENT Landfill Extension, is large, and the cumulative impact will be significant.

10a.11.2.3 The proposed mitigation measures during the construction and operation phases of the projects include:-

- WENT Landfill Extension: advanced screening tree planting, boundary green belt planting, temporary landscape treatment as green surface cover, existing tree preservation, etc.;
- STF: Re-use of topsoil in the construction of the soft landscape, existing trees preservation, transplanting of trees to adjacent locations, compensatory landscape planting, etc.; and

- IWMF: Grass-hydroseeded bare soil surface, provision of water pond as habitat for Little Grebe, existing trees preservation, transplanting of trees to adjacent locations, compensatory landscape planting, proper landscape design, reuse of existing boulders, greening design (rooftop & vertical greening), etc.

10a.11.2.4 Before the construction and operation of the WENT Landfill Extension, the cumulative impact of the IWMF and STF could be alleviated with the implementation of the proposed mitigation measures. With the landscape design of the IWMF being coherent with the adjacent STF, the development of the two facilities could be integrated and blend well in the surrounding landscape. The two developments would form a harmonic view. Besides, since the IWMF, STF and the existing Black Point Power Station, which is located near the project site, are industrial facilities of similar nature, the development of the IWMF is considered compatible with surrounding context.

10a.11.2.5 However, after the commencement of the construction and operation of the WENT Landfill Extension, the residual cumulative impact after implementation of the proposed mitigation measures will still be significant, considering the large-scale site formation, phase by phase in terms of site area, during the construction and operation of the WENT Landfill Extension.

10a.11.2.6 After the completion of the construction and operation phases of the WENT Landfill Extension, the restoration & aftercare phases of the WENT Landfill Extension will commence. Meanwhile, the IWMF and STF would be in Year 8 and Year 11 of the operation phase respectively. During the restoration phase of the WENT Landfill Extension, the mature advanced planting at the WENT Landfill Extension can act as screening effect for the WENT Landfill Extension in human eye level. During the aftercare phase of the WENT Landfill Extension, the compensatory planting at the WENT Landfill Extension will be under germination, providing preliminary vegetation cover for site area of the WENT Landfill Extension. At that time, the WENT Landfill Extension will become compatible with the surrounding IWMF and STF in which various landscape mitigation measures, such as landscape planting, green roof, vertical greening, have been implemented for a substantial period of time. The cumulative impact will be marginally acceptable with mitigation measures.

10a.11.2.7 After the whole period of restoration and aftercare phases of the WENT Landfill Extension, the impact due to the WENT Landfill Extension would be greatly mitigated by semi-mature compensatory woodland, shrubland and grassland with the proper mitigation maintenance, e.g. thinning of pioneer trees and enhancement planting of native tree species. The IWMF, STF and resorted WENT Landfill Extension would blend well and be merged as a whole. No significant residual cumulative impact is anticipated.

## **10a.12 Conclusion**

### ***10a.12.1 Landscape Impact***

10a.12.1.1 During the construction phase, the impact to the landscape resources and landscape character areas would be “insubstantial”, except the Ash Lagoon (LR1 & LCA1). The impact to the Ash Lagoon (LR1 & LCA1) before mitigation would be “substantial”.

10a.12.1.2 During the operation phase, the proposed works has negligible impact to most of the landscape resources and landscape character areas, except the Ash Lagoon (LR1 & LCA1) where the project site locates. The impact to the Ash Lagoon would be “substantial”. Mitigation measures including proper landscape design blending the facilities into the surroundings, rooftop/vertical greening design, landscape treatment,

provision of compensatory habitat for Little Grebe, etc. are anticipated to mitigate the landscape impact and enhance the overall landscape quality of the environment. The long-term residual impact to the Ash Lagoon would be reduced to “slight” in both day 1 and year 10 of operation.

10a.12.1.3 Surrounded by facilities of similar nature (e.g. STF, Black Point Power Station), the development of the IWMF at TTAL is considered compatible with the surrounding context. With the landscape design of the IWMF being coherent with the adjacent STF, the development of the two facilities could be integrated and blend well in the surrounding landscape. The two developments would form a harmonic view, and the cumulative landscape impact of the two developments would be alleviated. Another concurrent project is the WENT Landfill Extension. The construction phase of the IWMF will occur concurrently during the early construction phase of the WENT Landfill Extension while the operation phase of the IWMF will occur during the construction, operation, restoration and aftercare phases of the WENT Landfill Extension. The construction and operation of the WENT Landfill Extension will cause significant cumulative impact to the area due to large-scale site formation. During the restoration & aftercare phases of the WENT Landfill Extension, the IWMF and STF would be in Year 8 and Year 11 of the operation phase respectively. The mature advanced planting at the WENT Landfill Extension can act as screening effect for the WENT Landfill Extension, and the compensatory planting at the WENT Landfill Extension will provide preliminary vegetation cover for site area of the WENT Landfill Extension. The WENT Landfill Extension will become compatible with the surrounding IWMF and STF in which various landscape mitigation measures, such as landscape planting, green roof, vertical greening, have been implemented for a substantial period of time. After the whole period of restoration and aftercare phases of the WENT Landfill Extension, the impact due to the WENT Landfill Extension would be greatly mitigated by semi-mature compensatory woodland, shrubland and grassland. The IWMF, STF and resorted WENT Landfill Extension would blend well and be merged as a whole. No significant residual cumulative impact is anticipated.

### **10a.12.2 Visual Impact**

10a.12.2.1 The visual impact to most of the visual sensitive receivers during the construction phase would be “moderate”, and the visual impact to sea travellers of Deep Bay (VSR4) would be “substantial”. After the implementation of the mitigation measures, the residual impact to the sea travellers of Deep Bay would become “moderate / substantial” during construction.

10a.12.2.2 The visual impact to most of the visual sensitive receivers during the operation phase would be “moderate”, and the visual impact to the residents/visitors of Ha Pak Lai (VSR5) and the sea travellers of Deep Bay (VSR4) would be “moderate/substantial” and “substantial” respectively. After the implementation of the proposed mitigation measures, the residual impact to most of the visual sensitive receivers would be reduced to “slight”, and the residual impact to the residents/visitors of Ha Pak Lai (VSR5) and the sea travellers of Deep Bay (VSR4) would be “slight/moderate” in year 10 of operation.

10a.12.2.3 Regarding the visual impacts during waste transportation / handling and its cumulative visual impacts, the impact is expected to be insignificant. During the operation stage, MSW will be contained in containers and transported to the berth of WENT Landfill from the Refuse Transfer Stations (RTSs) through marine transport. This is the current mode of transportation to transfer MSW from the RTSs to the WENT Landfill. After arriving berth of the WENT Landfill, the container will be transported to the IWMF by land transport and MSW will then be discharged from the containers to the bunker at the IWMF reception hall, which is enclosed in a covered building. The potential visual impact due to waste transportation / handling is anticipated to be minimal.

10a.12.2.4 As mentioned in **Section 10a.12.1.3**, the development of the IWMF at TTAL is surrounded by facilities of similar nature (e.g. STF, Black Point Power Station). The IWMF is considered compatible with the surrounding context. With the architectural and landscape design of the IWMF being coherent with the adjacent STF, the development of the two facilities could be integrated and blend well in the surrounding landscape. The two developments would form a harmonic view, and the cumulative visual impact of the two developments would be alleviated.

### ***10a.12.3 Overall Residual Impact***

10a.12.3.1 In conclusion, the potential landscape and visual impacts can be effectively reduced by implementing the proposed mitigation measures during the construction and operation phases. With reference to criteria defined in Annex 10 of the EIAO TM, the overall residual impact is considered as “acceptable with mitigation measures” after implementing the mitigation measures.