

## 5 AIR QUALITY IMPACT

### 5.1 Introduction

5.1.1 In this section, the requirements, methodology, equipment, monitoring locations, criteria and protocols for the monitoring and audit of air quality impact associated with the construction and operational activities of the Project are presented. As identified in the EIA report, the Project would not cause any adverse air quality impacts. However, environmental monitoring and audit is recommended to monitor the effectiveness of the proposed measures.

5.1.2 The objectives of the air quality monitoring are:

- To identify the extent of dust impact during construction phase and odour impact during operational phase on sensitive receivers;
- To audit the compliance of the Contractor with regard to dust control, contract conditions and the relevant dust impact criteria;
- To check the effectiveness of odour mitigation measures by odour patrol and sediment sampling;
- To recommend further mitigation measures if found to be necessary; and
- To comply with Action and Limit Levels for air quality as defined in this Manual.

### 5.2 Air Quality Parameters

#### Construction Phase

5.2.1 Monitoring and audit of the TSP levels shall be carried out by the ET to ensure that any deteriorating air quality could be readily detected and timely action taken to rectify the situation.

5.2.2 1-hour and 24-hour average TSP levels shall be measured to indicate the impacts of construction dust on air quality. The 24-hour average TSP levels shall be measured by following the standard high volume sampling method as set out in the Title 40 of the United States Code of Federal Regulations, Chapter 1 (Part 50), Appendix B. Upon agreement from the Engineer's Representative (ER) and the IEC, 1-hour average TSP levels can be measured by direct reading methods to indicate short-term impacts.

5.2.3 All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, other local atmospheric factors affecting or affected by site conditions and work progress of the concerned site etc. shall be recorded in detail. A sample data record sheet based on the one presented in the EM&A Guidelines for Development Projects in Hong Kong, is shown in **Appendix B**. The ET Leader may modify the data record sheet for this EM&A programme, of which the format should be agreed by the ER and the IEC.

#### Operational Phase

##### *Odour Patrol*

5.2.4 Odour patrol should be conducted by independent trained personnel / competent persons patrolling and sniffing in the vicinity of the planned ASR along an odour patrol route within the Kai Tak Development as mentioned in **Section 5.4** to determine the operational odour impacts.

### *Sediment Sampling*

- 5.2.5 In order to determine the effectiveness of the bioremediation, monitoring of Acid Volatile Sulphide (AVS), Redox and residual nitrate in treated sediment should be carried out. The detailed sampling method as described in **Section 5.3**.

## **5.3 Monitoring Equipment**

### Construction Phase

- 5.3.1 High volume samplers (HVSs) in compliance with the following specifications shall be used for carrying out the 1-hour and 24-hour TSP monitoring:
- 0.6 - 1.7 m<sup>3</sup> per minute (20 - 60 standard cubic feet per minute) adjustable flow range;
  - Equipped with a timing / control device with  $\pm 5$  minutes accuracy for 24 hours operation;
  - Installed with elapsed-time meter with  $\pm 2$  minutes accuracy for 24 hours operation;
  - Capable of providing a minimum exposed area of 406 cm<sup>2</sup> ;
  - Flow control accuracy:  $\pm 2.5\%$  deviation over 24-hour sampling period;
  - Equipped with a shelter to protect the filter and sampler;
  - Incorporated with an electronic mass flow rate controller or other equivalent devices;
  - Equipped with a flow recorder for continuous monitoring;
  - Provided with a peaked roof inlet;
  - Incorporated with a manometer;
  - Able to hold and seal the filter paper to the sampler housing at horizontal position;
  - Easy to change the filter;
  - Capable of operating continuously for 24-hour period.
- 5.3.2 The ET shall be responsible for the provision of the monitoring equipment. The ET shall provide sufficient number of HVSs with appropriate calibration kit for carrying out the baseline, regular impacts monitoring and ad-hoc monitoring. The HVSs shall be equipped with an electronic mass flow controller and be calibrated against a traceable standard at regular intervals. All the equipment, calibration kit, filter papers, etc, shall be clearly labelled.
- 5.3.3 Initial calibration of the dust monitoring equipment shall be conducted upon installation and prior to commissioning, and at bi-monthly intervals subsequently. The transfer standard shall be traceable to the internationally recognised primary standard and be calibrated annually. The calibration data shall be properly documented for future reference by the concerned parties such as the IEC. All the data shall be converted into standard temperature and pressure condition.
- 5.3.4 The flow-rate of the sampler before and after the sampling exercise with the filter in position shall be verified to be constant and be recorded on the data sheet as shown in **Appendix B**.

- 5.3.5 If the ET proposes to use a direct reading dust meter to measure 1-hour average TSP levels, he/she shall submit sufficient information to the ER and the IEC to prove that the instrument is capable of achieving a comparable result as that of the HVS before it may be used for the monitoring works. The instrument shall also be calibrated regularly, and the 1-hour sampling shall be determined periodically by HVS to check the validity and accuracy of the results measured by direct reading method.
- 5.3.6 Wind data monitoring equipment shall also be provided by the ET and set up at conspicuous locations for logging wind speed and wind direction near to the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the ER in consultation with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:
- (i) The wind sensors shall be installed 10m above ground so that they are clear of obstructions or turbulence caused by the buildings;
  - (ii) The wind data shall be captured by a data logger. The data shall be downloaded for analysis at least once a month;
  - (iii) The wind data monitoring equipment shall be re-calibrated at least once every six months; and
  - (iv) Wind direction should be divided into 16 sectors of 22.5 degrees each.
- 5.3.7 In exceptional situations, the ET may propose alternative methods to obtain representative wind data upon approval from the ER and agreement from the IEC.

***Laboratory Measurement / Analysis***

- 5.3.8 A clean laboratory with constant temperature and humidity control and equipped with necessary measuring and conditioning instruments to handle the dust samples collected, shall be available for sample analysis, and equipment calibration and maintenance. The laboratory shall be HOKLAS accredited or other internationally accredited laboratory.
- 5.3.9 If a site laboratory is set up or a non-HOKLAS accredited laboratory is hired for carrying out the laboratory analysis, the laboratory equipment shall be approved by the IEC. Measurement performed by the laboratory shall be demonstrated to the satisfaction of the IEC.
- 5.3.10 The IEC shall conduct regular audit of the measurement performed by the laboratory so as to ensure the accuracy of measurement results. The ET shall provide the ER and the IEC with one copy of the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B for their reference.
- 5.3.11 Filter paper of size 8"x10" shall be labelled before sampling. It shall be a clean filter paper with no pinholes, and shall be conditioned in a humidity-controlled chamber for over 24-hour and be pre-weighed before use for the sampling.
- 5.3.12 After sampling, the filter paper loaded with dust shall be kept in a clean and tightly sealed bag. The filter paper shall then be returned to the laboratory for reconditioning in the humidity-controlled chamber followed by accurate weighing by an electronic balance with a readout down to 0.1mg. The balance shall be regularly calibrated against a traceable standard.
- 5.3.13 All the collected samples shall be kept in a good condition for 6 months before disposal.

### Operational Phase

#### *Odour Patrol*

- 5.3.14 Odour patrol should be conducted by independent trained personnel / competent persons (at least 2 odour patrol members) patrolling and sniffing in the vicinity of the planned ASRs along an odour patrol route within the Kai Tak Development as mentioned in **Section 5.4** to determine any potential operational odour impacts arising from Kai Tak Approach Channel (KTAC) and Kwun Tong Typhoon Shelter (KTTS). The odour patrol member should be participated in a set of screening tests using a certified n-butanol gas with their individual thresholds (n-butanol) complied with the requirement of European Standard Method (EN13725) in the range of 20 to 80 ppb. They should also be free from any respiratory diseases and do not normally work at or live in the area in the vicinity of typhoon shelters and KTAC.

#### *Sediment Sampling*

- 5.3.15 Undisturbed surface sediment core samples shall be collected by manual or gravity pushing the corer into the sediment. Care shall be taken in collection of the core to prevent contact with air or excessive mixing of the sample. The core shall be at least 0.8m in length. No iron or stainless steel components shall come into contact with the sediments at any time. Core recovery shall be at least 60% and the core shall be immediately sealed after collection to prevent leakage of odour and liquids. Care shall be taken in sealing the core in order to prevent any gas leakages and to minimize the amount of air inside the core. The core shall be properly labelled with information such as sampling ID, sample length, diameter and depth as well as sampling date and time.
- 5.3.16 The collected sediments shall subject to further chemical testing. The surface layer of sediments (from top to approximately 10cm in depth) shall be tested for the parameters in below.

Parameter	Method
pH / Redox	A WTW pH/redox meter (or equivalent) calibrated to ISO9002 standards
AVS	Refer to Environmental Toxicology and Chemistry, Vol. 13, No. 8; pp.1273-1275. 1974
Residual nitrate	APHA 4500 NO <sub>3</sub> -N E and 4500-NO <sub>2</sub> - B

## 5.4 Monitoring Locations

### Construction Phase

- 5.4.1 The proposed dust monitoring locations are shown in **Figure 2.1**. The selected monitoring locations are the ASRs located near to the Project site. The proposed air quality monitoring locations are listed in **Table 5.1** below.

**Table 5.1 Proposed Air Quality Monitoring Locations**

Location	ASR ID in EIA	Description
AM1	A29	Rhythm Garden
AM2	A32	Lee Kau Yan Memorial School
AM3	A40	Sky Tower
AM4	A47	Grand Waterfront
AM5	A58	CCC Kei To Secondary School
AM6	PA15	Site 1B4 (Planned)

- 5.4.2 The status and locations of the ASRs may change after issuing this Manual. The ET shall propose updated monitoring locations and seek approval from EPD, and agreement from the ER and the IEC before baseline monitoring commences.
- 5.4.3 When alternative monitoring locations are proposed, the following criteria, as far as practicable, shall be followed:
- (i) At the site boundary or such locations close to the major dust emission source;
  - (ii) Close to the ASRs;
  - (iii) Proper position/sitting and orientation of the monitoring equipment; and
  - (iv) Take into account the prevailing meteorological conditions.
- 5.4.4 The ET shall agree with the ER on the position of the HVS for installation of the monitoring equipment. When positioning the samplers, the following points shall be noted:
- (i) A horizontal platform with appropriate support to secure the samplers against gusty wind shall be provided;
  - (ii) No two samplers shall be placed less than 2 metres apart;
  - (iii) The distance between the sampler and an obstacle, such as buildings, must be at least twice the height that the obstacle protrudes above the sampler;
  - (iv) A minimum of 2 metres of separation from walls, parapets and penthouses is required for rooftop samplers;
  - (v) A minimum of 2 metres of separation from any supporting structure, measured horizontally is required;
  - (vi) No furnace or incinerator flue is nearby;
  - (vii) Airflow around the sampler is unrestricted;
  - (viii) The sampler is more than 20 metres from the dripline;
  - (ix) Any wire fence and gate, to protect the sampler, shall not cause any obstruction during monitoring;
  - (x) Permission must be obtained to set up the samplers and to obtain access to the monitoring stations; and
  - (xi) A secured supply of electricity is needed to operate the samplers.

#### Operational Phase

##### *Odour Patrol*

- 5.4.5 The proposed odour patrol route and the proposed sniffing locations in the vicinity of the planned ASRs during operational phase are shown in **Figure 5.1**.

### *Sediment Sampling*

- 5.4.6 Sediment sampling locations are summarized in below. Three samples should be collected randomly from each of the three areas namely northern KTAC, southern KTAC and KTTS. Details and number of samples to be collected at each area are summarized below.

Sampling Area	No. of Sample
(i) Northern Kai Tak Approach Channel (KTAC)	3
(iii) Southern KTAC	3
(iv) Kwun Tong Typhoon Shelter (KTTS)	3

## **5.5 Baseline Monitoring**

### Construction Phase

- 5.5.1 Baseline monitoring shall be carried out to determine the ambient 1-hour and 24-hour average TSP levels at the monitoring locations prior to the commencement of the Project works. During the baseline monitoring, there shall not be any construction or dust generating activities in the vicinity of the monitoring stations. The baseline monitoring will provide data for the determination of the appropriate Action Levels with the Limit Levels set against statutory or otherwise agreed limits.
- 5.5.2 Before commencing the baseline monitoring, the ET shall inform the IEC of the baseline monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the baseline monitoring results.
- 5.5.3 Baseline monitoring shall be carried out at all of the designated monitoring locations for at least 14 consecutive days prior to the commissioning of the construction works to obtain daily 24-hour TSP samples. One-hour sampling shall also be done at least 3 times per day. Baseline monitoring shall be carried out under typical weather conditions. General meteorological conditions (wind speed, direction and precipitation) and notes regarding any significant adjacent dust producing sources shall also be recorded throughout the baseline monitoring period.
- 5.5.4 In case the baseline monitoring cannot be carried out at the designated monitoring locations during the baseline monitoring period, the ET Leader shall carry out the monitoring at alternative locations which can effectively represent the baseline conditions at the impact monitoring locations. The alternative baseline monitoring location shall be approved by the ER and agreed with the IEC.
- 5.5.5 In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET Leader shall liaise with the ER, the IEC and EPD to agree on an appropriate set of data to be used as a baseline reference and submit to the ER and the IEC for agreement and EPD for approval.
- 5.5.6 Baseline checking of ambient TSP levels shall be carried out every three months at each monitoring location, when no dusty works activities are in operation. If the ET considers that significant changes in the ambient conditions have arisen, a repeat of the baseline monitoring may be carried out to update the baseline levels. The revised baseline levels, and hence the revised Action and Limit Levels, shall be agreed with the ER, EPD and the IEC.

## Operational Phase

### *Odour Patrol*

- 5.5.7 Prior to the implementation of the proposed full-scale in-situ bioremediation at KTAC and KTTS, a baseline odour patrol shall be undertaken along the proposed odour patrol route as shown in **Figure 5.1**. The baseline odour patrol shall be carried out monthly from July to September along the same odour route and at the same sniffing locations. The odour patrol shall be carried out during daytime and evening/night time covering high tide and low tide conditions. No odour patrol shall be conducted during rainy days.
- 5.5.8 The objective of the baseline odour patrol is to provide some baseline data for future validation of the effectiveness of the odour mitigation measures. The independent trained personnel / competent persons shall record the findings including time of survey, tidal condition, weather condition such as sunny, fine, cloudy and rainy, odour intensity, odour nature and possible odour sources, and also the local wind speed and direction at each sniffing location.
- 5.5.9 In addition, the following information shall be obtained:
- Meteorological conditions (including temperature, wind speed, wind direction, relative humidity) from the nearest Hong Kong Observatory's Weather Station including King's Park and Kai Tak meteorological stations during the monitoring;
  - Whether any abnormal observation at the KTAC and KTTS during the monitoring.

### *Sediment Sampling*

- 5.5.10 Prior to the implementation of the proposed full-scale in-situ bioremediation at KTAC and KTTS, a baseline sediment sampling shall be undertaken at KTAC and KTTS.

## **5.6 Impact Monitoring**

### Construction Phase

- 5.6.1 The ET shall carry out impact monitoring during the construction phase of the Project. For regular impact monitoring, a sampling frequency of at least once in every six days shall be strictly observed at all of the monitoring stations for 24-hour TSP monitoring. For 1-hour TSP monitoring, the sampling frequency of at least three times in every six days shall be undertaken when the highest dust impact occurs.
- 5.6.2 Before commencing the impact monitoring, the ET shall inform the IEC of the impact monitoring programme such that the IEC can conduct on-site audit to ensure accuracy of the impact monitoring results.
- 5.6.3 The specific time to start and stop the 24-hour TSP monitoring shall be clearly defined for each location and be strictly followed by the field operator.
- 5.6.4 In case of non-compliance with the Action and Limit Levels, more frequent monitoring, as specified in the Event and Action Plan in **Table 5.3**, shall be conducted within 24 hours after the non-compliance is known. This additional monitoring shall be continued until the excessive dust emission or the deterioration in air quality is rectified.

## Operational Phase

### *Odour Patrol*

- 5.6.5 Odour patrol shall be conducted by at least 2 independent trained personnel / competent persons patrolling and sniffing along the proposed odour patrol route as shown in **Figure 5.1**.
- 5.6.6 Monthly (from July to September) odour patrol for a period of 2 years shall be conducted during the operational phase after completion of the odour remediation works conducted at KTAC and KTTS including the full-scale in-situ bioremediation, localized maintenance dredging and the 600m gap opening. The monitoring events shall be carried out during daytime and evening/night time covering high tide and low tide conditions. No odour patrol shall be conducted during rainy days. The need to continue the odour patrol at the end of the second year would be subjected to the odour patrol results and should be agreed with EPD.
- 5.6.7 The need to further extend the odour patrol after the end of the 2 years monitoring period would depend on the monitoring results. If the results of detected odour intensity at any sniffing location is higher than 1 due to potential odour emission from KTAC in two consecutive months, the odour patrol programme shall be extended until the odour intensity (that is determined to be due to potential odour emission from KTAC) at all the sniffing locations have dropped to below 1 in three consecutive months.
- 5.6.8 The independent trained personnel / competent persons shall:
- have their individual odour threshold of n-butanol in nitrogen gas in the range of 20 to 80 ppb/v required by the European Standard Method (EN 13725).
  - be at least 16 years of age and willing and able to follow instructions.
  - be free from any respiratory illnesses.
  - be engaged for a sufficient period to build up and monitor/detect at several monitoring location;
  - not be allowed to smoke, eat, drink (except water) or use chewing gum or sweets 30 min before and during odour intensity analysis;
  - take great care not to cause any interference with their own perception or that of others by lack of personal hygiene or the use of perfumes, deodorants, body lotions or cosmetics;
  - not communicate with each other about the results of their choices.
- 5.6.9 At least two independent trained personnel / competent persons shall be selected to form a patrol team to conduct the odour intensity analysis, who should be participated in a set of screening tests.
- 5.6.10 Subject to the prevailing weather forecast condition, odour patrol shall be conducted by independent trained personnel / competent persons along the proposed odour patrol route as shown in **Figure 5.1**. During the patrol, the sequence should start from less odorous locations to stronger odorous locations.
- 5.6.11 The independent trained personnel / competent persons shall use their nose (olfactory sensors) to sniff odours at different locations. The main odour emission sources and the areas to be affected by the odour nuisance shall be identified.

- 5.6.12 The perceived odour intensity is to be divided into 5 levels which are ranked in the descending order as follows:
- 0 - Not detected. No odour perceived or an odour so weak that it can not be easily characterised or described;
  - 1 - Slight Identifiable odour, and slight chance to have odour nuisance;
  - 2 - Moderate Identifiable odour, and moderate chance to have odour nuisance;
  - 3 - Strong Identifiable, likely to have odour nuisance;
  - 4 - Extreme Severe odour, and unacceptable odour level.
- 5.6.13 The independent trained personnel / competent persons shall record the findings including time of survey, tidal condition, weather condition such as sunny, fine, cloudy and rainy, odour intensity, odour nature and possible odour sources, and also the local wind speed and direction at each location. In addition, some relevant meteorological data such as daily average temperature, and daily average humidity, on that surveyed day shall be obtained from the nearest Hong Kong Observatory Stations including King's Park and Kai Tak meteorological stations for reference.

#### *Sediment Sampling*

- 5.6.14 Annual sediment sampling for a period of 2 years shall be conducted during the operational phase after completion of the odour remediation works conducted at KTAC and KTTS including the full-scale in-situ bioremediation, localized maintenance dredging and the 600m gap opening. The need to continue the sediment sampling at the end of the second year would be subjected to the sediment sampling results and should be agreed with EPD.

### **5.7 Event and Action Plan**

- 5.7.1 The baseline monitoring results form the basis for determining the Action and Limit Levels for the impact monitoring. The ET shall compare the impact monitoring results with the Action and Limit Levels for 1-hour and 24-hour average TSP. **Table 5.2** shows the Action and Limit Levels to be used for construction dust and odour patrol. Should non-compliance of the Action and Limit Levels occurs, action in accordance with the Event and Action Plan in **Table 5.3** and **5.4** shall be carried out.
- 5.7.2 In the event when an odour complaint is received, CEDD shall liaise with the complainant and a register the complaint. The complaint register is to record detailed information regarding the odour complaint and hence, facilitates efficient investigation work. The registration shall contain, but not be limited to the following information:
- Location of where the odour nuisance occurred;
  - Date and time of the complaint and the nuisance event;
  - Description of the complaint, i.e. the type and characteristics of the odour; and an indication of the odour strength (highly offensive / offensive / slightly offensive / just continuously detectable /intermittently detectable);
  - Meteorological conditions from the nearest HK Observatory station at the time of complaint; and
  - Name and contact information of the complainant.

**Table 5.2 Action and Limit Levels for Air Quality**

Parameter	Action Level <sup>(1)</sup>	Limit Level
24-hour average TSP	$BL \leq 200 \mu\text{g m}^{-3}$ , $AL = (BL * 1.3 + LL)/2$ $BL > 200 \mu\text{g m}^{-3}$ , $AL = LL$	$260 \mu\text{g m}^{-3}$
1-hour average TSP	$BL \leq 384 \mu\text{g m}^{-3}$ , $AL = (BL * 1.3 + LL)/2$ $BL > 384 \mu\text{g m}^{-3}$ , $AL = LL$	$500 \mu\text{g m}^{-3}$
Odour Nuisance (from odour intensity analysis or odour patrol)	<ul style="list-style-type: none"> <li>➤ When one documented complaint are received<sup>(2)</sup>; or</li> <li>➤ Odour Intensity of 2 is measured from odour intensity analysis.</li> </ul>	<ul style="list-style-type: none"> <li>➤ Two or more documented complaints are received<sup>(2)</sup> within a week; or</li> <li>➤ Odour Intensity of 3 or above is measured from odour intensity analysis.</li> </ul>

Note: (1) BL = Baseline level, AL = Action Level, LL = Limit Level.  
(2) Once the complaint is received from CEDD/EPD, CEDD would investigate and verify the complaint whether it is related to the potential odour emission from KTTS, KTAC and KTN.

**Table 5.3 Event and Action Plan for Construction Dust Monitoring**

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action Level being exceeded by one sampling	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Inform Contractor, IEC and ER;</li> <li>3. Repeat measurement to confirm finding.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method.</li> </ol>	<ol style="list-style-type: none"> <li>1. Notify Contractor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any unacceptable practice;</li> <li>2. Amend working methods if appropriate.</li> </ol>
Action Level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Inform Contractor, IEC and ER;</li> <li>3. Increase monitoring frequency to daily;</li> <li>4. Discuss with IEC and Contractor on remedial actions required;</li> <li>5. Assess the effectiveness of Contractor's remedial actions;</li> <li>6. If exceedance continues, arrange meeting with IEC and ER;</li> <li>7. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise implementation of remedial measures;</li> <li>5. Conduct meeting with ET and IEC if exceedance continues.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss with ET and IEC on proper remedial actions;</li> <li>2. Submit proposals for remedial actions to ER and IEC within three working days of notification;</li> <li>3. Implement the agreed proposals;</li> <li>4. Amend proposal if appropriate.</li> </ol>
Limit Level being exceeded by one sampling	<ol style="list-style-type: none"> <li>1. Identify source and investigate the causes of exceedance;</li> <li>2. Inform Contractor, IEC, ER, and EPD;</li> <li>3. Repeat measurement to confirm finding;</li> <li>4. Assess effectiveness of Contractor's remedial actions and keep EPD, IEC and ER informed of the results.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss with ET and Contractor on possible remedial measures;</li> <li>4. Advise the ER on the effectiveness of the proposed remedial measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise implementation of remedial measures;</li> <li>5. Conduct meeting with ET and IEC if exceedance continues.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Discuss with ET and IEC on proper remedial actions;</li> <li>3. Submit proposals for remedial actions to ER and IEC within three working days of notification;</li> <li>4. Implement the agreed proposals.</li> </ol>

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Limit Level being exceeded by two or more consecutive sampling	<ol style="list-style-type: none"> <li>1. Notify IEC, ER, Contractor and EPD;</li> <li>2. Repeat measurement to confirm findings;</li> <li>3. Carry out analysis of Contractor's working procedures to identify source and investigate the causes of exceedance;</li> <li>4. Increase monitoring frequency to daily;</li> <li>5. Arrange meeting with IEC, ER and Contractor to discuss the remedial actions to be taken;</li> <li>6. Assess effectiveness of Contractor's remedial actions and keep EPD, IEC and ER informed of the results;</li> <li>7. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check monitoring data submitted by ET;</li> <li>2. Check Contractor's working method;</li> <li>3. Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of exceedance in writing;</li> <li>2. Notify Contractor;</li> <li>3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>4. Supervise implementation of remedial measures;</li> <li>5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance;</li> <li>2. Discuss with ET, ER and IEC on proper remedial actions;</li> <li>3. Submit proposals for remedial actions to IEC within three working days of notification;</li> <li>4. Implement the agreed proposals;</li> <li>5. Submit further remedial actions if problem still not under control;</li> <li>6. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.</li> </ol>

**Table 5.4 Event and Action Plan for Odour Monitoring**

EVENT	ACTION	
	Person-in-charge of Odour Monitoring	CEDD <sup>1</sup>
<b>ACTION LEVEL</b>		
Exceedance of action level (Odour Patrol)	<ol style="list-style-type: none"> <li>1. Identify source/reason of exceedance;</li> <li>2. Repeat odour patrol to confirm finding.</li> </ol>	<ol style="list-style-type: none"> <li>1. Carry out investigation to identify the source/reason of exceedance. Investigation shall be completed within 2 week;</li> <li>2. Rectify any unacceptable practice;</li> <li>3. Implement more mitigation measures if necessary;</li> <li>4. Inform EPD or DSD or MD if exceedance is considered to be caused by expedient connections or floating debris.</li> </ol>
Exceedance of action level (Odour Complaints)	<ol style="list-style-type: none"> <li>1. Identify source / reason of exceedance;</li> <li>2. Carry out odour patrol to determinate odour intensity.</li> </ol>	<ol style="list-style-type: none"> <li>1. Carry out investigation and verify the complaint whether it is related to potential odour emission from KTTS, KTAC and KTN.</li> <li>2. Carry out investigation to identify the source/reason of exceedance. Investigation shall be completed within 2 week;</li> <li>3. Rectify any unacceptable practice;</li> <li>4. Implement more mitigation measures if necessary;</li> <li>5. Inform EPD or DSD or MD if exceedance is considered to be caused by expedient connections or floating debris.</li> </ol>
<b>LIMIT LEVEL</b>		
Exceedance of Limit level	<ol style="list-style-type: none"> <li>1. Identify source / reason of exceedance;</li> <li>2. Inform EPD</li> <li>3. Repeat odour patrol to confirm findings;</li> <li>4. Increase odour patrol frequency to bi-weekly;</li> <li>5. Assess effectiveness of remedial action and keep EPD informed of the results.</li> <li>6. If exceedance stops, cease additional odour patrol.</li> </ol>	<ol style="list-style-type: none"> <li>1. Carry out investigation to identify the source/reason of exceedance. Investigation shall be completed within 2 week;</li> <li>2. Rectify any unacceptable practice;</li> <li>3. Formulate remedial actions;</li> <li>4. Ensure remedial actions properly implemented;</li> <li>5. If exceedance continues, consider what more/enhanced mitigation measures shall be implemented;</li> <li>6. Inform EPD or DSD or MD if exceedance is considered to be caused by expedient connections or floating debris.</li> </ol>

<sup>1</sup> CEDD will identify an implementation agent.

## 5.8 Mitigation Measures

### Construction Phase

- 5.8.1 Mitigation measures for dust are recommended in the EIA Report. The Contractor shall be responsible for the design and implementation of these measures.
- 5.8.2 In order to ensure compliance with the acceptable criteria at the ASRs at all time, requirements of the *Air Pollution Control (Construction Dust) Regulation* shall be adhered to during the construction period. Misting for any stockpile of materials and provision of windbreaks on three sides are proposed to prevent wind erosion. An environmental monitoring and auditing program shall be implemented to monitor the construction process in order to enforce controls and modify methods of work if dusty conditions are arisen. In addition, the following good site practices are recommended to minimise dust and other air pollutants impacts during soil excavation, transportation, loading and unloading the excavated contaminated soils:
- Stockpiling site(s) should be lined with impermeable sheeting and bunded. Stockpiles should be fully covered by impermeable sheeting to reduce dust emission.
  - Misting for the dusty material should be carried out before being loaded into the vehicle.
  - Any vehicle with an open load carrying area should have properly fitted side and tail boards.
  - Material having the potential to create dust should not be loaded from a level higher than the side and tail boards and should be dampened and covered by a clean tarpaulin.
  - The tarpaulin should be properly secured and should extend at least 300 mm over the edges of the sides and tailboards. The material should also be dampened if necessary before transportation.
  - The vehicles should be restricted to maximum speed of 10 km per hour and confined haulage and delivery vehicle to designated roadways inside the site. On-site unpaved roads should be compacted and kept free of loose materials.
  - Vehicle washing facilities should be provided at every vehicle exit point.
  - The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores.
  - Every main haul road should be sealed with concrete and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet.
  - Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the three sides.
  - Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.
- 5.8.3 The implementation schedule for the recommended air quality impact mitigation measures is presented in **Appendix A4**.

#### Operational Phase

- 5.8.4 Mitigation measures have been formulated to alleviate the existing odour problem generated from Kwun Tong Typhoon Shelter (KTTS), KTAC and Kai Tak Nullah. These include reconstruction or decking of KTN within the former apron area, full mitigation of the potential odour emissions from the headspace of KTN and Jordan Valley Box Culvert (JVBC) near the existing discharge locations, localised maintenance dredging within KTAC, 600m gap opening at the northern section of the former runway to improve the water circulation in KTAC, and the implementation of in-situ bioremediation to treat the sediment accumulated at KTAC and KTTS.
- 5.8.5 The implementation schedule for the recommended odour mitigation measures is presented in **Appendix A4**.