



Water Supplies Department
Hong Kong Special Administrative Region Government



**The Decommissioning of Underground Fuel Tanks at
Tsuen Wan No.1 Pumping Station
Environmental Impact Assessment**

Environmental Monitoring and Audit Manual

ARUP

Ove Arup & Partners (HK) Ltd.

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1 INTRODUCTION

1.1 Purpose of the Manual

1.1.1.1 The purposes of this Environmental Monitoring and Audit (EM&A) Manual are:

- to guide the setup of an EM&A programme; and
- to ensure compliance with the recommendations suggested in the EIA Report.

1.1.1.2 This Manual outlines the monitoring and audit programme to be undertaken for the decommissioning, dismantling and removal of four underground diesel storage tanks at Tsuen Wan No.1 Pumping Station. It aims to provide systematic procedures for monitoring, auditing and minimising the environmental impacts associated with the decommissioning of the underground diesel storage tanks.

1.1.1.3 Relevant information in the Hong Kong environmental regulations, EPD's generic EM&A manual, and recommendations in the EIA study report on the decommissioning, dismantling and removal of four underground diesel storage tanks at Tsuen Wan No.1 Pumping Station have been used to set up this Manual.

1.1.1.4 This Manual contains the following:

- a) Responsibilities of the Contractor, the Engineer or Engineer's Representative (ER), Environmental Team (ET) with respect to the EM&A requirements during decommissioning of the underground diesel storage tanks;
- b) Information on project organization and programming of decommissioning activities for the project;
- c) Requirements with respect to the decommissioning schedule and the necessary environmental monitoring and audit programme to track the varying environmental impact;
- d) Full details of the methodologies to be adopted, including all field, laboratory and analytical procedures, and details on quality assurance;
- e) Definition of Action and Limit levels;

- f) Establishment of event and action plans;
- g) Requirements of reviewing pollution sources and working procedures required in the event of non-compliance of the environmental criteria and complaints;
- h) Requirements for review of EIA predictions, implementation of mitigation measures, and the effectiveness of the environmental protection and pollution control measures adopted;
- i) Requirements of presentation of environmental monitoring and audit data and appropriate reporting procedures.

1.1.1.5 For the purpose of this manual, the "Engineer" shall refer to the Engineer as defined in the Contract or the Engineer's Representative (ER), in cases where the Engineer's powers have been delegated to the ER, in accordance with the Contract. The ET leader, who shall be responsible for and in charge of the ET, shall refer to the person, delegated the role of executing the EM&A requirements.

1.2 Background

1.2.1.1 Tsuen Wan No.1 Pumping Station is situated at the southeast corner of the intersection between Wai Tsuen Road and Miu Kong Street. The location of the site is shown on **Figure 1.1**.

1.2.1.2 The Pumping Station has been in operation since 1955. All pumpsets and associated power supply and control equipment are now approaching the end of their serviceable lives. To improve the operation of the Pumping Station, the existing manned equipment including pumpsets, electrical switchgears, and piping and valving systems will be replaced. The seven electrical motor driven and three diesel engine driven pumpsets currently in use are to be replaced by eight electrical pumpsets.

1.2.1.3 With the phasing out of the three diesel engine driven pumpsets, the four underground diesel fuel storage tanks at the Pumping Station, each with a capacity of 64,000 litres will be decommissioned, dismantled and removed.

1.2.1.4 The Pumping Station is surrounded by various sensitive receivers, which include residential buildings, education centres, an indoor recreation centre and historical buildings. **Figure 1.1** gives the locations of these sensitive receivers.

1.3 Description of EIA Study

- 1.3.1.1 Ove Arup & Partners (Arup) was commissioned by the Water Supplies Department (WSD) to conduct an Environmental Impact Assessment (EIA) Study for the decommissioning of underground fuel tanks at Tsuen Wan No.1 Pumping Station. This decommissioning work forms part of the project - upgrading the safety, reliability and efficiency of the aged mechanical and electrical plant at Tsuen Wan No. 1 Pumping Station.
- 1.3.1.2 The work element – decommissioning and removal of the underground diesel fuel storage tanks, of the Project is categorized under Item 16 Part II of Schedule 2 of the Environmental Impact Assessment Ordinance (Cap 499) (EIAO) as a Designated Project. An EIA study shall be carried out in accordance with the Study Brief (ESB-045/1999) issued by Environmental Protection Department (EPD) in January 2000. An Environmental Monitoring and Audit Manual is therefore produced as part of the Study Brief requirement.

1.4 Environmental Monitoring & Audit Requirements

- 1.4.1.1 The EIA results have been reported in the EIA report. A summary of the recommendation and the implementation schedule is attached in Appendix 1 for reference.

1.5 Project Organisation

- 1.5.1.1 The project should form an organization consisting of the ET, ER and Contractor to take the responsibilities of the environmental protection matters. The ET should not be any associated body of the Contractor. The project organization and lines of communication with respect to environmental protection works are shown in Figure 1.2. The responsibilities of respective parties are detailed in the following sub-sections.

1.5.2 Environmental Team

- 1.5.2.1 The Environmental Team should be led by an Environmental Team Leader (ET Leader), who should have at least 7 years experience in EM&A or environmental management. The duties of the Environmental Team are:

- a) To meet the agreed objectives and deadlines as set out in this EM&A Manual;
- b) To monitor the various environmental parameters as required by this Manual;
- c) To follow up and close out of the non-compliance actions;
- d) To investigate and audit the Contractor's equipment and work methodologies with respect to pollution control and environmental mitigation and to anticipate environmental issues that may require mitigation before the problem arises;
- e) To audit and prepare audit reports on the environmental monitoring data and the site environmental conditions; and
- f) To report the environmental monitoring and audit results to the Contractor, the Engineer and EPD.

1.5.3 Engineer/Engineer's Representative

1.5.3.1 The Engineer's Representative (ER) shall:

- a) Appoint an ET to undertake monitoring and reporting of EM&A, and to arrange laboratory analysis as necessary;
- b) Monitor the Contractor's compliance with contract specifications, including the effective implementation and operation of the environmental mitigation measures;
- c) Instruct the Contractor to follow the agreed protocols or those in the Contract Specifications in the event of exceedances or complaints; and
- d) Comply with the agreed Event Contingency Plan in the event of any exceedance.

1.5.4 Contractor

- a) Provide assistance to ET in carrying out monitoring;
- b) Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event Contingency Plan;
- c) Implement measures to reduce impact where Action and Limit levels are exceeded; and

- d) Work within the scope of the construction contract and other tender conditions with respect to environmental requirements.

1.6 Decommissioning Programme

- 1.6.1.1 It has been advised that the decommissioning works of the underground diesel storage tanks will be undertaken from June 2002 to December 2002.

1.7 Structure of the EM&A Manual

- 1.7.1.1 The structure of this EM&A Manual is outlined below for easy reference:

Section	Title	Aims
1	Introduction	An introduction of the background information and the layout of the EM&A Manual
2	Construction Noise	Outline the requirements, methodology, equipment, monitoring locations, and criteria for noise monitoring
3	Air Quality	List the information reviewed in the EIA study
4	Land Contamination	List the information reviewed in the EIA study
5	Cultural Heritage	List the information reviewed in the EIA study
6	Waste Management	List the information reviewed in the EIA study
7	Water Quality Assessment	List the information reviewed in the EIA study
8	Site Environmental Audit	Present the requirement and recommendations for the site environmental audit
9	Reporting	Present the requirement and recommendations for reporting

Appendices	Description
1	Implementation Schedule
2	Sample Data Sheets of Monitoring
3	Proposed Noise Monitoring Locations
4	Sample of Complaints Proforma

2 NOISE

2.1 Noise Monitoring Requirement

- 2.1.1.1 In this section, the requirements, methodology, equipment, monitoring locations, criteria and protocols for the monitoring and audit of noise impacts during the decommissioning period of the Project are presented.

2.2 Noise Parameters

- 2.2.1.1 The construction noise level shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(30 \text{ min})}$ shall be used as the monitoring parameter for the time period between 0700-1900 hours on normal weekdays. For all other time periods, $L_{eq(5 \text{ min})}$ shall be employed for comparison with the NCO criteria.
- 2.2.1.2 As supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference. A sample data record sheet is shown in [Appendix 2](#) for reference.

2.3 Monitoring Equipment

- 2.3.1.1 As referred to the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agree to within 1.0dB.
- 2.3.1.2 Noise measurements should not be made in the presence of fog, rain, wind with a steady speed exceeding 5ms^{-1} or wind with gusts exceeding 10ms^{-1} . The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.
- 2.3.1.3 The ET Leader is responsible for the provision of the monitoring equipment. He shall ensure that sufficient noise measuring equipment and associated instrumentation are

available for carrying out the baseline monitoring, regular impact monitoring and ad hoc monitoring. All the equipment and associated instrumentation shall be clearly labeled.

2.4 Monitoring Locations

- 2.4.1.1 The noise monitoring locations are shown in **Appendix 3 and Table 2.1**. The status and locations of noise sensitive receivers may change after issuing this manual. If such cases exist, the ET Leader shall propose updated monitoring locations and seek approval from ER and agreement from EPD of the proposal.

Table 2.1 : Description of noise monitoring locations

NSR ID	Description	Uses
NM1	Caritas Adult Education Centre	Educational Institution
NM2	Fong Hon Chu Gifted Education Centre	Educational Institution

- 2.4.1.2 When alternative monitoring locations are proposed, the monitoring locations should be chosen based on the following criteria:

- a) at locations close to the major site activities which are likely to have noise impacts;
- b) close to the noise sensitive receivers (N.B. For the purposes of this section, any domestic premises, hotel, hostel, temporary housing accommodation, hospital, medical clinic, educational institution, place of public worship, library, court of law, performing art centre should be considered as noise sensitive receiver); and
- c) for monitoring locations located in the vicinity of the sensitive receivers, care should be taken to cause minimal disturbance to the occupants during monitoring.

- 2.4.1.3 The monitoring station shall normally be at a point 1m from the exterior of the sensitive receivers building facade and be at a position 1.2m above the ground. If there is problem with access to the normal monitoring position, an alternative position may be chosen, and a correction to the measurements shall be made. For reference, a correction of +3dB(A) shall be made to the free field measurements. The ET Leader shall agree with the ER on the monitoring position and the corrections adopted. Once the positions for the monitoring stations are chosen, the baseline monitoring and the impact monitoring shall be carried out at the same positions.

2.5 Baseline Monitoring

- 2.5.1.1 The ET Leader shall carry out baseline noise monitoring prior to the commencement of the decommissioning works. The baseline monitoring shall be carried out continuously over the daytime period (0700-1900) for every weekday and Saturday for at least two consecutive weeks using the $L_{Aeq,(30min)}$ parameters. Monitoring during the restricted periods shall comprise 3 consecutive $L_{Aeq,(5min)}$ readings at least once in every restricted period (1900-2300 and 2300-0700). 3 consecutive $L_{Aeq,(5min)}$ readings shall also be measured in Sunday/General Holiday for each period of 0700-1900, 1900-2300 and 2300-0700 of next day. A schedule on the baseline monitoring shall be submitted to the ER for approval before the monitoring starts.
- 2.5.1.2 There shall not be any construction activities in the vicinity of the stations during the baseline monitoring.
- 2.5.1.3 In exceptional cases, when insufficient baseline monitoring data or questionable results are obtained, the ET Leader shall liaise with EPD to agree on an appropriate set of data to be used as a baseline reference and submit to the ER for approval.

2.6 Impact Monitoring

- 2.6.1.1 As no decommissioning works will be carried out in restricted or general holiday, the monitoring is only required to be conducted during normal working hour (0700-1900 Monday to Saturday) for the measurement of $L_{Aeq, 30min}$ noise levels (as six consecutive $L_{Aeq, 5min}$ readings) at the agreed monitoring locations. The monitoring shall be carried out once per week in accordance with the methodology in the TM.
- 2.6.1.2 In relation to the monitored noise levels, other noise sources such as road traffic may make a significant contribution to the overall noise environment. Therefore, the results of noise monitoring activities will take into account such influencing factors, which may not be presented during the baseline monitoring period. All measurements shall be recorded to the nearest 0.1dB.
- 2.6.1.3 If a school exists near the construction activity, noise monitoring shall be carried out at the monitoring stations for the schools during the school examination periods. The ET Leader shall liaise with the school's personnel and the Examination Authority to ascertain the exact dates and times of all examination periods during the course of the contract.

- 2.6.1.4 In case of non-compliance with the construction noise criteria, more frequent monitoring as specified in the Action Plan in Section 2.7 shall be carried out. This additional monitoring shall be continued until the recorded noise levels are rectified or proved to be irrelevant to the construction activities.

2.7 Event and Action Plan for Noise

The Action and Limit levels for construction noise are defined in Table 2.2. Should non-compliance of the criteria occur, actions in accordance with the Action Plan in Table 2.3 shall be carried out.

Table 2.2 : Action and limit levels for construction noise

Time period	Action	Limit
0700-1900hrs on normal weekdays	When one documented complaint is received	75* dB(A)

Remarks:

* reduce to 70 dB(A) for schools and 65 dB(A) during school examination periods.

Table 2.3 : Event/ action plan for construction noise

Event	Action	
	ET Leader or ER	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify Contractor 2. Analyse investigation 3. Require Contractor to propose measures for the analysed noise problem 4. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to Environmental Team Leader/Engineer's Representative 2. Implement noise mitigation proposals
Limit Level	<ol style="list-style-type: none"> 1. Notify Contractor 2. Notify EPD 3. Require contractor to implement mitigation measures 4. Increase monitoring frequency to check mitigation effectiveness 	<ol style="list-style-type: none"> 1. Implement mitigation measures 2. Prove to Environmental Team Leader ER effectiveness of measures applied

2.8 Noise Mitigation Measures

- 2.8.1.1 The EIA report has recommended construction noise control and mitigation measures. The Contractor shall be responsible for the design and implementation of these measures.
- Scheduling of construction works outside school examination period/ during summer holidays to less intrusive periods would definitely reduce the noise impacts on the NSRs;
 - Intermittent noisy activities should be scheduled to minimise exposure of nearby NSRs to high levels of construction noise. For example, excavator can be scheduled to remove the spoils after the concrete slab has been broken up by using hand-held

breaker, the excavator and truck shall be operated sequentially (i.e. the breaker, excavator and truck should not be used contiguously);

- c) Limiting operating time of construction equipment, e.g excavator and crane-mounted truck/ lorry operate for 20 minutes in every consecutive 30-minute period and hand held breakers for about 15 minutes;
- d) Using quieter powered mechanical equipment;
- e) Locating of 3.5m high hoarding along the site boundary, or movable noise barrier to screen noise at ground level zone. For high-rise NSRs, cantilevered top cover should be considered. The surface density of these barriers and hoarding need to be not less than 13kg/m^2 ;
- f) Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme;
- g) Machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- h) Plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs;
- i) Silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; and
- j) A rigorous EM&A programme should be undertaken, and should focus on those NSRs of particular concern, in order to identify and rectify any problems at the earliest possible stage.

2.8.1.2 If the above measures are not sufficient to restore the construction noise quality to an acceptable levels upon the advice of ET Leader, the Contractor shall liaise with the ET Leader on some other mitigation measures, propose to ER for approval, and carry out the mitigation measures.

2.8.1.3 Details of implementation schedule for the decommissioning works is presented in **Appendix 1**.

3 AIR QUALITY

- 3.1.1.1 Only limited number of PME will be used for this decommissioning project and all decommissioning works will be carried out within the pumping station for a short period. These activities would not generate large amount of construction dust.
- 3.1.1.2 The EIA report has recommended dust control and mitigation measures. The Contractor shall be responsible for the design and implementation of these measures:
- a) Spray the area at which demolition work takes place with water or a dust suppression chemical immediately prior to, during and immediately after the demolition activities so as to maintain the entire surface wet;
 - b) Cover all demolished items (including tress, shrubs, vegetation, boulders, poles, pillars, structures, debris, rubbish and other items arising from site clearance) entirely by impervious sheeting or place them in an area sheltered on the top and the 3 sides within a day of demolition;
 - c) Open stockpiles should be avoided or covered;
 - d) Use of wind shield or dust extractor at the loading and unloading areas;
 - e) Use of tarpaulin to cover all dusty material on the transport vehicle;
 - f) Side enclosure and covering of any aggregate or dusty material storage piles;
 - g) Provision of temporary or movable barriers between the site and sensitive receivers;
 - h) Position of all plant at the maximum separation distance from receiver if possible.
- 3.1.1.3 If the above measures are not sufficient to restore the air quality to acceptable levels upon the advice of ET Leader, the Contractor shall liaise with the ET Leader on some other mitigation measures, propose to ER for approval, and implement the mitigation measures.

4 LAND CONTAMINATION

- 4.1.1.1 A land contamination assessment has been conducted as part of the EIA study. The historical information and the current conditions of the Pumping Station indicated that the potential of land contamination of the subject site is very low. Moreover, none of the diesel storage tanks and diesel pipeline sections are embedded in soils. The chances to have previous spillage or leakage of diesel fuel into the soils or groundwater are very slim.
- 4.1.1.2 Although the risk of land contamination of the subject site area is very low, confirmatory samples are still required to be taken from the ground below the tanks when the concrete chambers lining has been removed so as to provide a quantitative checking. A minimum of 5 soil samples (4 at corners and 1 at middle) shall be taken at the depth of 0.5m under each concrete chamber. The collected soil samples shall be analysed for TPH, and the testing result shall be compared with the Dutch List to evaluate any potential contamination.
- 4.1.1.3 The following precautionary measures shall also be implemented to minimise any potential hazard on the workers during decommissioning of the underground diesel storage tanks.
- a) Personal Protective Equipment (PPE) such as safety hat, chemical protective gloves, masks (for both dust and vapour) eye goggles, protective clothing and protective footwear etc. shall be provided to staff who would be involved in the decommissioning works. No works should be allowed without the suitable PPE.
 - b) Workers shall inspect and check their PPE before, during and after use. In cases where any of the PPE is impaired, the worker shall stop work immediately and inform the site agent. The worker shall not be allowed to re-start his work until the impaired PPE is replaced.
 - c) Workers shall always maintain basic hygiene standard (e.g. hand wash before leaving the contaminated work zone). Workers shall also be responsible for cleaning and storing their own PPE in a secure place before leaving the site.
 - d) Eating, drinking and smoking must be strictly prohibited within the site area.
 - e) The decommissioning works, particularly the breaking of the concrete chamber of the diesel storage tank and removal of the broken concrete, shall be carried out in dry weather condition to prevent any surface run-off. The decommissioning works shall

be stopped immediately once surface water run-off caused by rainfall or otherwise is observed.

- f) Stockpiling of excavated material (i.e. broken concrete and the associated soils) shall be avoided. Where this cannot be avoided, temporary cover such as tarpaulin shall be provided for the stockpile material (if any).
- g) The contractor's representatives must be informed if any workers feel uncomfortable physically or mentally during the decommissioning works. All workers shall leave the work areas and the work shall be temporarily suspended until the reason for the uncomfortable feeling has been identified.
- h) The decommissioning works shall be stopped or discontinued when any typhoon signals or storm signal (amber, red or black) is hoisted. All stockpile materials (if any) shall be covered immediately by tarpaulin or other similar protective and waterproof materials.

4.1.1.4 In the event that any suspected petroleum contaminated soils (e.g. discoloured soil or visual/olfactory signs of contamination) were observed, apart from the above precautionary measures, the following procedures shall also be followed:

- a) The contractor's representatives shall stop the decommissioning works immediately and inform the relevant party (e.g. EPD Local Control Office).
- b) A minimum of 2 samples of the potential petroleum contaminated soils from each suspected area shall be collected for the analysis of Total Petroleum Hydrocarbon (TPH) to confirm whether the soil is contaminated. A qualified Land Contamination Specialist shall be engaged to supervise the soil sampling and interpret the laboratory results for evaluation of the contamination level.
- c) If the soils is confirmed as contaminated (i.e. exceed the Dutch B value), a 5m-diameter boundary and 2.5m depth (around the sampling point where the contaminated soils was collected) of the soil shall be excavated. All excavation work of the contaminated soils shall be carried out in dry weather condition to prevent any contaminated pond and surface runoff.
- d) The contaminated soils shall be excavated by mechanical excavators. Manual excavation shall be avoided.

- e) Stockpiling of the excavated contaminated soils shall be avoided. However, if stockpiling is required, the contaminated soils shall be stockpiled in a designated concrete paved and bunded area.
- f) The stockpiled contaminated soils shall be covered by water proved material (i.e. tarpaulin) to prevent contaminated surface runoff. Fencing with warning sign shall be erected around the stockpiled area to prevent unauthorised entry.
- g) Following the excavation of the contaminated soils, confirmatory soil samples shall be collected from the base and perimeter of excavation and tested for TPH. A minimum of 5 samples (4 boundary and 1 from the centre of the excavation) shall be collected from each excavation location. All sampling shall be supervised and the results interpreted by a qualified Land Contamination Specialist. If the analytical results of any one sample exceeded the Dutch B value, the excavation must be extended by a 0.5m increment (vertically and horizontally) and the sampling regime repeated until all contaminated soils is excavated.
- h) As TPH contaminated soils is treated as chemical waste, approval from the Facilities Management Group of EPD shall be obtained prior to the disposal of the contaminated soils to co-disposal landfill or other authorised disposal sites. A licensed contractor shall be appointed for the collection, transportation and disposal of the TPH contaminated soils.

5 CULTURAL HERITAGE

- 5.1.1.1 There are two historical buildings that may be affected by the decommissioning work. They are Sam Tung Uk (a Declared Monument) and Tin Hau Kung (a Grade II Historical Building) located at approximately 110m to the west and 130m to the northwest from the Pumping Station respectively.
- 5.1.1.2 All works will be carried out within the boundary of the pumping station and will involve only a limited number of PME, adverse vibration and dust impacts on the cultural heritage are not anticipated. However, practical mitigation measures, which are agreed by the Antiquities and Monuments Office, shall be designed and implemented if any adverse impacts are proved in the course of the project.
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6 WASTE MANAGEMENT

- 6.1.1.1 The Contractor is responsible for waste control within the construction site, removal of the waste material produced from the site and to implement any mitigation measures to minimise waste or redress problems arising by the waste produced from the site. The waste material may include any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the site onto any adjoining land, storm sewer, sanitary sewer, or any waste matter or refuse to be deposited anywhere within the site or onto any adjoining land.
- 6.1.1.2 When handling the waste material, the following measures shall be undertaken:
- a) Provide on-site waste separation facilities;
 - b) Provide storage areas for construction and demolition material;
 - c) Separate non-inert and inert waste and dispose to appropriate locations;
 - d) Store chemical waste separately and engage licensed chemical contractors to dispose of the waste; and
 - e) Provide on-site refuse collection point.
- 6.1.1.3 The implementation schedule of mitigation measures is presented in **Appendix 1**.
- 6.1.1.4 The Contractor shall also pay attention to the Waste Disposal Ordinance, the Dumping at Sea Ordinance, the Public Health and Municipal Services Ordinance and the Water Pollution Control Ordinance, and carry out the appropriate waste management work. The relevant licence/permit, such as the effluent discharge licence, the chemical waste producer registration, etc. shall be obtained. The Contractor shall refer to the relevant booklets issued by EPD when applying for the licence / permit.
- 6.1.1.5 During the site inspections and the document review procedures as mentioned in Section 8 of this manual, the ET Leader shall pay special attention to the issues relating to waste management, and check whether the Contractor has followed the relevant contract specifications and the procedures specified under the laws of Hong Kong.

7 WATER QUALITY

- 7.1.1.1 The Pumping Station is located in an urban-developed area. No Water Sensitive Receiver (WSR) is identified within 200m of the site boundary of Pumping Station.
- 7.1.1.2 Potential sources of impacts to water quality from the decommissioning of the underground diesel storage tanks are Construction Runoff and Sewage effluents generated from the decommissioning workforce.
- 7.1.1.3 The following measures shall be undertaken to reduce construction runoff:
- a) Provision of a designated area far from the nearby storm drain and foul sewers should be provided for a temporary stockpiling of the topsoil. Temporary covers (i.e. tarpaulin) shall also be provided to minimise the generation of high SS runoff.
 - b) A licensed waste collector shall be standby on-site to collect the chemical waste as well as the used water from diesel tank purging. The used water will then be transported to a facility liscened to receive chemical waste, such as Chemical Waste Treatment Facility at Tsing Yi.
- 7.1.1.4 The existing toilet of the Pumping Station will be provided for the decommissioning workforce. No additional sanitary facilities will be required and hence adverse impact is not anticipated.

8 SITE ENVIRONMENTAL AUDIT

8.1 Site Inspection

- 8.1.1.1 Site Inspections provide a direct means to trigger and enforce the specified environmental protection and pollution control measures. They shall be undertaken routinely to inspect the construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. With well defined pollution control and mitigation specifications and a well established site inspection, deficiency and action reporting system, the site inspection is one of the most effective tools to enforce the environmental protection requirements on the construction site.
- 8.1.1.2 The ET Leader is responsible for formulation of the environmental site inspection, deficiency and action reporting system, and carrying out the site inspection works. He shall submit a proposal on the site inspection, deficiency and action reporting procedures within 21 days of the construction contract commencement to the Contractor for agreement and to the ER for approval.
- 8.1.1.3 Regular site inspections shall be carried out at least once per week. The areas of inspection shall not be limited to the environmental situation, pollution control and mitigation measures within the site; it should also review the environmental situation outside the site area which is likely to be affected, directly or indirectly, by the site activities. The ET Leader shall make reference to the following information in conducting the inspection:
- a) the EIA recommendations on environmental protection and pollution control mitigation measures;
 - b) works progress and programme;
 - c) individual works methodology proposals (which shall include proposal on associated pollution control measures);
 - d) the contract specifications on environmental protection;
 - e) the relevant environmental protection and pollution control laws; and
 - f) previous site inspection results.

- 8.1.1.4 The Contractor shall update the ET Leader with all relevant information of the construction contract for him to carry out the site inspections. The inspection results and its associated recommendations on improvements to the environmental protection and pollution control works shall be submitted to the ER and the Contractor within 24 hours, for reference and for taking immediate action. The Contractor shall follow the procedures and time-frame as stipulated in the environmental site inspection, deficiency and action reporting system formulated by the ET Leader, to report on any remedial measures subsequent to the site inspections.
- 8.1.1.5 Ad hoc site inspections shall also be carried out by the ET Leader if significant environmental problems are identified. Inspections may also be required subsequent to receipt of an environmental complaint, or as part of the investigation work, as specified in the Action Plan for environmental monitoring and audit.

8.2 Compliance with Legal and Contractual Requirement

- 8.2.1.1 There are contractual environmental protection and pollution control requirements as well as environmental protection and pollution control laws in Hong Kong, which the construction activities shall comply with.
- 8.2.1.2 In order that the works are in compliance with the contractual requirements, all the works method statements submitted by the Contractor to the ER for approval shall be sent to the ET Leader for vetting, to see whether sufficient environmental protection and pollution control measures have been included.
- 8.2.1.3 The ET Leader shall also review the progress and programme of the works to check that relevant environmental laws have not been violated, and that the any foreseeable potential for violating the laws can be prevented.
- 8.2.1.4 The Contractor shall regularly copy relevant documents to the ET Leader so that the checking work can be carried out. The document shall at least include the updated Work Progress Reports, the updated Works Programme, the application letters for different licence/permits under the environmental protection laws, and all the valid licence/permit. The site diary shall also be available for the ET Leader's inspection upon his request.
- 8.2.1.5 After reviewing the document, the ET Leader shall advise the ER and the Contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the ET Leader's review concludes that the current status on licence/permit application and any

environmental protection and pollution control preparation works may not cope with the works programme, or may result in potential violation of environmental protection and pollution control requirements by the works in due course, he shall also advise the Contractor and the ER accordingly.

- 8.2.1.6 Upon receipt of the advice, the Contractor shall undertake immediate action to remedy the situation. The ER shall follow up to ensure that appropriate action has been taken by the Contractor in order that the environmental protection and pollution control requirements are fulfilled.

8.3 Environmental Complaints

- 8.3.1.1 Complaints shall be referred to the ET Leader for carrying out complaint investigation procedures. The ET Leader shall undertake the following procedures upon receipt of the complaints:

- a) log complaint and date of receipt onto the complaint database;
- b) investigate the complaint to determine its validity, and to assess whether the source of the problem is due to works activities;
- c) if a complaint is valid and due to works, identify mitigation measures;
- d) if mitigation measures are required, advise the Contractor accordingly;
- e) review the Contractor's response on the identified mitigation measures, and the updated situation;
- f) if the complaint is transferred from EPD, submit interim report to EPD on status of the complaint investigation and follow-up action within the time frame assigned by EPD;
- g) undertake additional monitoring and audit to verify the situation if necessary, and review that any valid reason for complaint does not recur;
- h) report the investigation results and the subsequent actions to the source of complaint for responding to complainant (If the source of complaint is EPD, the results should be reported within the time frame assigned by EPD); and
- i) record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.

- 8.3.1.2 During the complaint investigation work, the Contractor and ER shall cooperate with the ET Leader in providing all the necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor shall promptly carry out the mitigation. The ER shall ensure that the measures have been carried out by the Contractor.
- 8.3.1.3 A flow chart of the complaint response procedures is shown in Figure 8.1. An example of a complaints proforma is given in [Appendix 4](#).

9 REPORTING

9.1 General

9.1.1.1 The following reporting requirements are based upon a paper documented approach. However, the same information can be provided in an electronic medium upon agreeing the format with the ER and EPD. This would enable a transition from a paper/historic and reactive approach to an electronic/real time proactive approach.

9.2 Baseline Monitoring Report

9.2.1.1 The ET Leader shall prepare and submit a Baseline Environmental Monitoring Report within 10 working days of completion of the baseline monitoring. Copies of the Baseline Environmental Monitoring Report shall be submitted to each of the three parties: the Contractor, the ER and the EPD. The ET Leader shall liaise with the relevant parties on the exact number of copies they want. The format of the report and the format of the baseline monitoring data in magnetic media to be submitted to EPD shall be agreed with EPD.

9.2.1.2 The baseline monitoring report shall include at least the following:

- a) up to half a page executive summary;
- b) brief project background information;
- c) drawings showing locations of the baseline monitoring stations;
- d) monitoring results (in both hard and diskette copies) together with the following information:
 - monitoring methodology
 - equipment used and calibration details
 - parameters monitored
 - monitoring locations (and depth)
 - monitoring date, time, frequency and duration;
- e) details on influencing factors, including:
 - major activities, if any, being carried out on the site during the period
 - weather conditions during the period

- other factors which might affect the results;
- f) determination of the Action and Limit Levels for each monitoring parameter and statistical analysis of the baseline data;
- g) revisions for inclusion in the EM&A Manual; and
- h) comments and conclusions.

9.3 Monthly EM&A Reports

- 9.3.1.1 The results and findings of all EM&A work required in the Manual shall be recorded in the monthly EM&A reports prepared by the ET Leader. The EM&A report shall be prepared and submitted within 10 working days of the end of each reporting month, with the first report due in the month after construction commences. A maximum of 4 copies of each monthly EM&A report shall be submitted to each of the three parties: the Contractor, the ER and the EPD. Before submission of the first EM&A report, the ET Leader shall liaise with the parties on the exact number of copies and format of the monthly reports in both hard copy and electronic medium requirement.
- 9.3.1.2 The ET leader shall review the number and location of monitoring stations and parameters every 6 months or on an as needed basis, in order to cater for the changes in surrounding environment and nature of works in progress.

9.3.2 *First Monthly EM&A Report*

- 9.3.2.1 The first monthly EM&A report shall include at least the following :
- a) 1-2 pages executive summary;
 - b) basic project information including a synopsis of the project organisation, programme and management structure, and the work undertaken during the month;
 - c) a brief summary of EM&A requirements including:
 - all monitoring parameters
 - environmental quality performance limits (Action and Limit levels)
 - Event-Action Plans
 - environmental mitigation measures, as recommended in the project EIA study final report

- environmental requirements in contract documents;
- d) advice on the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the project EIA study report, summarized in the updated implementation schedule;
- e) drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;
- f) monitoring results (in both hard and diskette copies) together with the following information:
 - monitoring methodology
 - equipment used and calibration details
 - parameters monitored
 - monitoring locations (and depth)
 - monitoring date, time, frequency, and duration;
- g) advice on the solid and liquid waste management status;
- h) a summary of non-compliance (exceedances) of the environmental quality performance limits (Action and Limit levels);
- i) a review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures;
- j) a description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance;
- k) a summary record of all complaints received (written or verbal) for each media, including locations and nature of complaints, liaison and consultation undertaken, actions and follow-up procedures taken and summary of complaints; and
- l) An account of the future key issues as reviewed from the works programme and work method statements.

9.3.3 Subsequent EM&A Reports

The subsequent monthly EM&A reports shall include the following :

- a) Title Page;




- b) Executive Summary (1-2 pages)
 - Breaches of AL levels
 - Complaint Log
 - Reporting Changes
 - Future key issues;
- c) Contents Page;
- d) Environmental Status
 - Drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations
 - Summary of non-compliance with the environmental quality performance limits
 - Summary of complaints;
- e) Environmental Issues and Actions
 - Review issues carried forward and any follow-up procedures related to earlier non-compliance (complaints and deficiencies)
 - Description of the actions taken in the event of noncompliance and deficiency reporting
 - Recommendations (should be specific and target the appropriate party for action)
 - Implementation status of the mitigation measures and the corresponding effectiveness of the measures;
- f) Future Key Issues; and
- g) Appendix
 - AL levels
 - Graphical plots of trends of monitored parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
 - i) major activities being carried out on site during the period
 - ii) weather conditions during the period
 - iii) any other factors which might affect the monitoring results
 - Monitoring schedule for the present and next reporting period
 - Cumulative complaints statistics
 - Details of complaints, outstanding issues and deficiencies.




9.4 Data Keeping






The site document, such as the monitoring field records, laboratory analysis records, site inspection forms, etc. are not required to be included in the monthly EM&A reports for submission. However, the document shall be well kept by the ET Leader and be ready for inspection upon request. All relevant information shall be clearly and systematically recorded in the document. The monitoring data shall also be recorded in magnetic media form, and the software copy can be available upon request. All the documents and data shall be kept for at least one year after completion of the construction contract.









APPENDIX 1 –Implementation Schedule

Implementation Schedule

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location/ Duration of measures/ Timing of completion of measures	Implementation Agent	Implementation Stage**				Relevant Legislation & Guidelines
					Des	C	O	Dec	
Section 4.3.5	A1	<p><u>Construction Noise Impact</u></p> <p>1) use of good site practices to limit noise emissions by considering the following:</p> <ul style="list-style-type: none"> - Scheduling of construction works outside school examination period/ during summer holidays - Sequencing of Plant Operation, i.e. the breaker, excavator and truck will not be operated contiguously - Limiting the operating time of construction equipment on site. Excavator and crane, mounted trucks to be operated for 20minutes in every 30-minute period and hand held breakers for 15 minutes. - Selection of quiet plants which complied with the BS 5228 Part 1 or TM Standards - Use of 3.5m high hoarding along the site boundary, or movable noise barrier to screen noise at ground level zone. For high-rise Noise Sensitive Receivers, cantilevered top cover should be considered. The surface density of these barriers and hoarding need to be not less than 13kg/m². - Well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme - Machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum - Plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs - Silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works 	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					Noise Control Ordinance and EIAO TM
Section 5.4	B1	<p><u>Air Quality</u></p> <p>1) The contractor is obliged to follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation</p> <ul style="list-style-type: none"> - Spray the area at which demolition work takes place with water or a dust suppression chemical immediately prior to, during and immediately after the demolition activities so as to maintain the entire surface wet. - Cover all demolished items (including tress, shrubs, vegetation, boulders, poles, pillars, structures, debris, rubbish and other items arising from site clearance) entirely by impervious sheeting or place them in an area sheltered on the top and the 3 sides within a day of demolition. - Use of wind shield or dust extractor at the loading and unloading areas - Use of tarpaulin to cover all dusty material on the transport vehicle - Side enclosure and covering of any aggregate or dusty material storage piles - Provision of temporary or movable barriers between the site and sensitive receivers - Position of all plant at the maximum separation distance from receiver if possible - Position of all plant at the maximum separation distance from receiver if possible - Any stockpile of dusty material shall be either <ol style="list-style-type: none"> a) covered entirely by impervious sheeting; b) place in an area sheltered on the top and the three sides; or c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet." 	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					Air Pollution Control (Construction Dust) Regulation Schedule
	B2	<p>2) Odour impact</p> <ul style="list-style-type: none"> - After removal of the concrete slab cover and during the demolition of the underground storage tanks, use of tarpaulin to cover the exposed area. - Install temporary fencing on all sides - Place a warning signal in conspicuous positions of the work site 	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					
		<p>In the event that odour is found during the decommissioning works:</p> <ul style="list-style-type: none"> -stand-by blower to be turned on to dilute the odour concentration as much as possible 							

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location/ Duration of measures/ Timing of completion of measures	Implementation Agent	Implementation Stage**				Relevant Legislation & Guidelines
					Des	C	O	Dec	
Section 6.6	C1	<p><u>Land Contamination</u></p> <p>1) Confirmatory test:</p> <ul style="list-style-type: none"> - Although the risk of land contamination of the subject site area is very low, confirmatory samples are still required to be taken from the ground below the tanks when the concrete chambers lining has been removed so as to provide a quantitative check on the recommended inspection. The samples shall be of a minimum of 5 soil samples (4 at corners and 1 at middle) taken at 0.5m deep under each concrete chamber. The collected soil samples shall be analysed for TPH and the testing result shall be compared with the Dutch List to evaluate any potential contamination. 	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					
	C2	<p>2) Protection on workers:</p> <ul style="list-style-type: none"> - Personal Protective Equipment (PPE) such as safety hat, chemical protective gloves, masks (for both dust and vapour) eye goggles, protective clothing and protective footwear etc. shall be provided to staff who would be involved in the decommissioning works. No works should be allowed without the suitable PPE. -Workers shall inspect and check their PPE before, during and after use. In cases where any of the PPE is impaired, the worker shall stop work immediately and inform the site agent. The worker shall not be allowed to re-start his work until the impaired PPE is replaced. -Workers shall always maintain basic hygiene standard (e.g. hand wash before leaving the contaminated work zone). Workers shall also be responsible for cleaning and storing their own PPE in a secure place before leaving the site. -Eating, drinking and smoking must be strictly prohibited within the site area. -The decommissioning works, particularly the breaking of the concrete chamber of the diesel storage tank and removal of the broken concrete, shall be carried out in dry weather condition to prevent any surface run-off. The decommissioning works shall be stopped immediately once surface water run-off caused by rainfall or otherwise is observed. -Stockpiling of excavated material (i.e. broken concrete and the associated soils) shall be avoided. Where this cannot be avoided, temporary cover such as tarpaulin shall be provided for the stockpile material (if any). -The site agent or other site management representatives must be informed if any worker feel uncomfortable physically or mentally during decommissioning works. All workers shall leave the work areas and the work shall be temporarily suspended until the reason for the uncomfortable has been identified. -The decommissioning works shall be stopped or discontinued when any typhoon signals yellow, red or black storm signals are hoisted. All stockpile materials (if any) shall be covered immediately by tarpaulin or other similar protective and waterproof materials. 	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					
	C3	<p>3) If suspected petroleum contaminated soils (e.g. discoloured soil or visual/olfactory signs of contamination) were observed, apart from the above precautionary measures, the following procedures shall also be followed:</p> <ul style="list-style-type: none"> - The site agent/site management representative shall stop the decommissioning works immediately and inform the relevant party (e.g. EPD Local Control Office). - A minimum of 2 samples of the potential petroleum contaminated soils from each suspected area shall be collected for the analysis of Total Petroleum Hydrocarbon (TPH) to confirm whether the soil is contaminated. A qualified Land Contamination Specialist shall be engaged to supervise the soil sampling and interpret the laboratory results for evaluation of the contamination level. 	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					
		<ul style="list-style-type: none"> - If the soils is confirmed as contaminated (i.e. exceed the Dutch B value), a 5m-diameter boundary and 2.5m depth (around the sampling point where the contaminated soils was collected) of the soil shall be excavated. All excavation work of the contaminated soils shall be carried out in dry weather condition to prevent any contaminated pond and surface runoff. - The contaminated soils shall be excavated by mechanical excavators. Manual excavation shall be avoided. 							

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location/ Duration of measures/ Timing of completion of measures	Implementation Agent	Implementation Stage**				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		<ul style="list-style-type: none"> - Stockpiling of the excavated contaminated soils shall be avoided. However, if stockpiling is required, the contaminated soils shall be stockpiled in a designated concrete paved and bunded area. - The stockpiled contaminated soils shall be covered by water proved material (i.e. tarpaulin) to prevent contaminated surface runoff. Fencing with warning sign shall be erected around the stockpiled area to prevent unauthorised entry. 							
		<ul style="list-style-type: none"> - Following the excavation of the contaminated soils, confirmatory soil samples shall be collected from the base and perimeter of excavation and tested for TPH. A minimum of 5 samples (4 boundary and 1 from the centre of the excavation) shall be collected from each excavation location. All sampling shall be supervised and the results interpreted by a qualified Land Contamination Specialist. If the analytical results of any one sample exceeded the Dutch B value, the excavation must be extended by a 0.5m increment (vertically and horizontally) and the sampling regime repeated until all contaminated soils is excavated. - As TPH contaminated soils is treated As chemical waste, approval from the Facilities Management Group of EPD shall be obtained prior to the disposal of the contaminated soils to co-disposal landfill or other authorised disposal sites. A licensed contractor shall be appointed for the collection, transportation and disposal of the TPH contaminated soils. 							
Section 7.3	D1	<p><u>Cultural Heritage</u></p> <p>1) Only agreed number of PME shall be used. Although no adverse vibration and dust impacts are anticipated on the identified built heritage, practical mitigation measures, which are agreed by the AMO, shall be designed and implemented if any adverse impacts are proved in the course of the project.</p>	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					EIAO TM and Antiquities and Monuments Ordinance
Section 8.4	E1	<p><u>Waste Management</u></p> <p>1) The following waste management hierarchy should be considered in general:</p> <ul style="list-style-type: none"> - Avoidance and minimisation (not generating waste through changing or improving practices and design); - Reuse of materials, thus avoiding disposal (generally with only limited reprocessing); - Recovery and recycling, thus avoiding disposal (although reprocessing may be required); and - Treatment and disposal, according to relevant regulations, guidelines and good practice. <p>- Consult the Waste Disposal Authority on the final disposal locations of waste</p>	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					Waste Disposal Ordinance
	E2	<p>2) Excavated Inert Material</p> <ul style="list-style-type: none"> - Proper segregation to avoid possible contaminated materials being allowed for reused on site 	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					Waste Disposal Ordinance
	E3	<p>3) Demolition Waste</p> <ul style="list-style-type: none"> - Proper segregation of demolition waste on site to increase the feasibility that certain components of waste can be recycled. - Consult specialist collectors for recycling of dismantled diesel storage tanks and associated pipeline 	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					New Disposal Arrangements for Construction Waste
		<ul style="list-style-type: none"> - Disposal of at a specifies landfill, or at a public dump site (preferable) such as Pak Shek Kok Reclamation Public Filling Area and Tuen Mun Reclamation Public Filling Area 							
	E4	<p>4) Chemical Waste</p> <ul style="list-style-type: none"> - Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers. 	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					Code of Practice on the Packaging, Handling and Storage of Chemical Waste and Waste Disposal (Chemical Waste) (General) Regulation

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location/ Duration of measures/ Timing of completion of measures	Implementation Agent	Implementation Stage**				Relevant Legislation & Guidelines
					Des	C	O	Dec	
		- Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. For mitigation measures, the guidelines covered under the construction phase mitigation of chemical wastes should be referred.							
		- Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. - The storage area for chemical wastes should be clearly labelled and used solely for the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated.							
	E5	5) General Refuse - Remove general refuse from the site, separately from construction and chemical waste, on a daily or every second day basis to minimise odour, pest and litter impacts. - Burning of refuse on site is prohibited	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					Waste Disposal Ordinance
	E6	6) Storage area for different waste types - Different types of wastes should be segregated and stored in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal. An on-site temporary storage area should be provided.	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					
	E7	7) Trip-ticket system - In order to monitor the disposal of C&DM at public filling facilities and landfills, and control of fly-tipping, a trip-ticket system should be included.	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					
	E8	8) Records of wastes:- - A recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed.	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					
	E9	9) Training - Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					
Section 9.4	F1	<u>Water Quality</u> 1) Construction Runoff - Follow the site practices outlined in ProPECC PN 1/94 as far as practicable in order to minimise surface runoff and the chance of erosion, and to reduce any suspended solids prior to discharge - Minimise the exposed soil areas to reduce the contamination of runoff and erosion.	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					ProPECC PN 1/94 and Water Pollution Control Ordinance
		- Provide a designated area far from the nearby storm drain and fowl sewers for temporary stockpiling of topsoil. - Provide temporary cover (i.e. tarpaulin) to minimise the generation of high SS runoff. - Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers.							
	F2	2) Sewage Effluents - Existing toilet will be provided for the decommissioning workforce.	Throughout the construction phase within the site areas	To be implemented by Contractor(s)					ProPECC PN 1/94 and Water Pollution Control Ordinance

Note:

* All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and/or accepted public comment to the proposed project

EIA* Ref.	EM&A Log Ref.	Environmental Protection Measures*	Location/ Duration of measures/ Timing of completion of measures	Implementation Agent	Implementation Stage**				Relevant Legislation & Guidelines
					Des	C	O	Dec	

** Des = Design, C = Construction, O = Operation, Dec = Decommissioning

Reassessment are necessary when there are changes in PME.

Alternative measures which are proven to have equivalent or higher performance are acceptable.

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APPENDIX 2 – Sample Data Sheets of Monitoring

Noise Monitoring Field Record Sheet

Monitoring Location		
Description of Location		
Date of Monitoring		
Measurement Start Time (hh:mm)		
Measurement Time Length (min.)		
Noise Meter Model/Identification		
Calibrator Model/Identification		
Measurement Results	L ₉₀ (dB(A))	
	L ₁₀ (dB(A))	
	Leq (dB(A))	
Major Construction Noise Source(s) During Monitoring		
Other Noise Source(s) During Monitoring		
Remarks		

Name & Designation

Signature

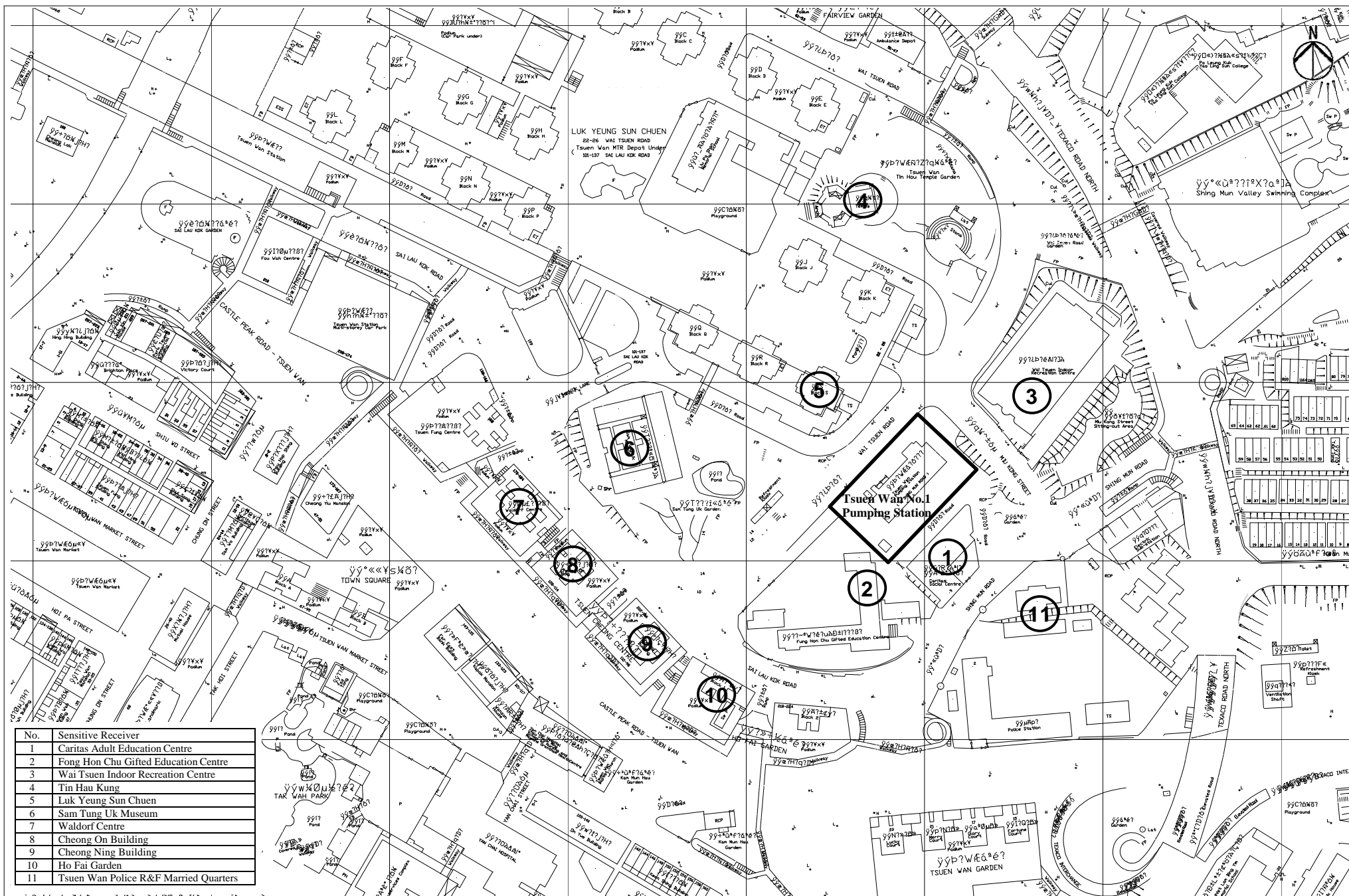
Date

Recorded By :

Checked By :

APPENDIX 3 – Proposed Noise Monitoring Locations

APPENDIX 4 – Sample of Complaints Proforms



No.	Sensitive Receiver
1	Caritas Adult Education Centre
2	Fong Hon Chu Gifted Education Centre
3	Wai Tsuen Indoor Recreation Centre
4	Tin Hau Kung
5	Luk Yeung Sun Chuen
6	Sam Tung Uk Museum
7	Waldorf Centre
8	Cheong On Building
9	Cheong Ning Building
10	Ho Fai Garden
11	Tsuen Wan Police R&F Married Quarters

REV	DATE	BY	SUB	APP	DESCRIPTION	REV	DATE	BY	SUB	APP	DESCRIPTION

DESIGNED BY	AY
DRAWN BY	AY
CHECKED BY	FC
IN CHARGE	ST
DATE	

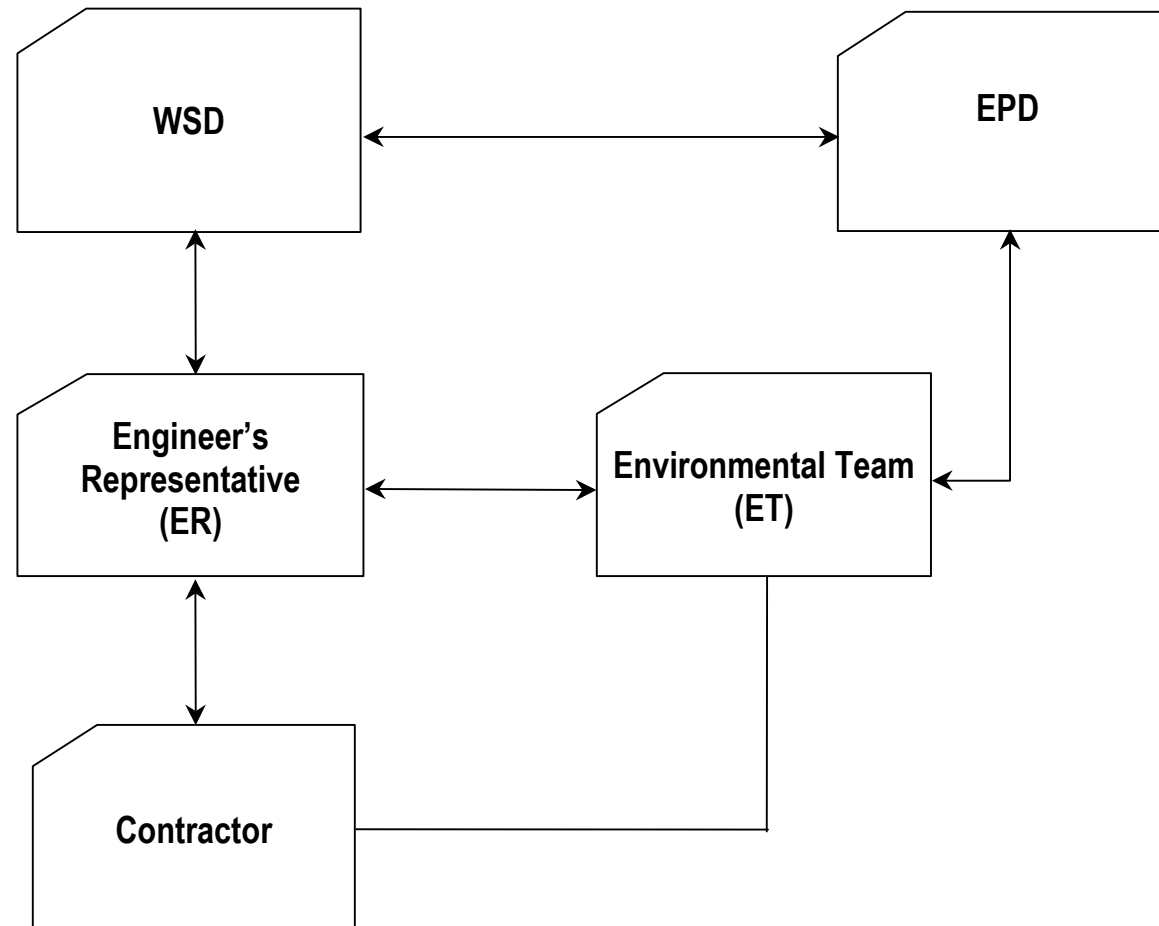
Locations of Site and Sensitive Receivers

ARUP Ove Arup & Partners
Hong Kong Limited

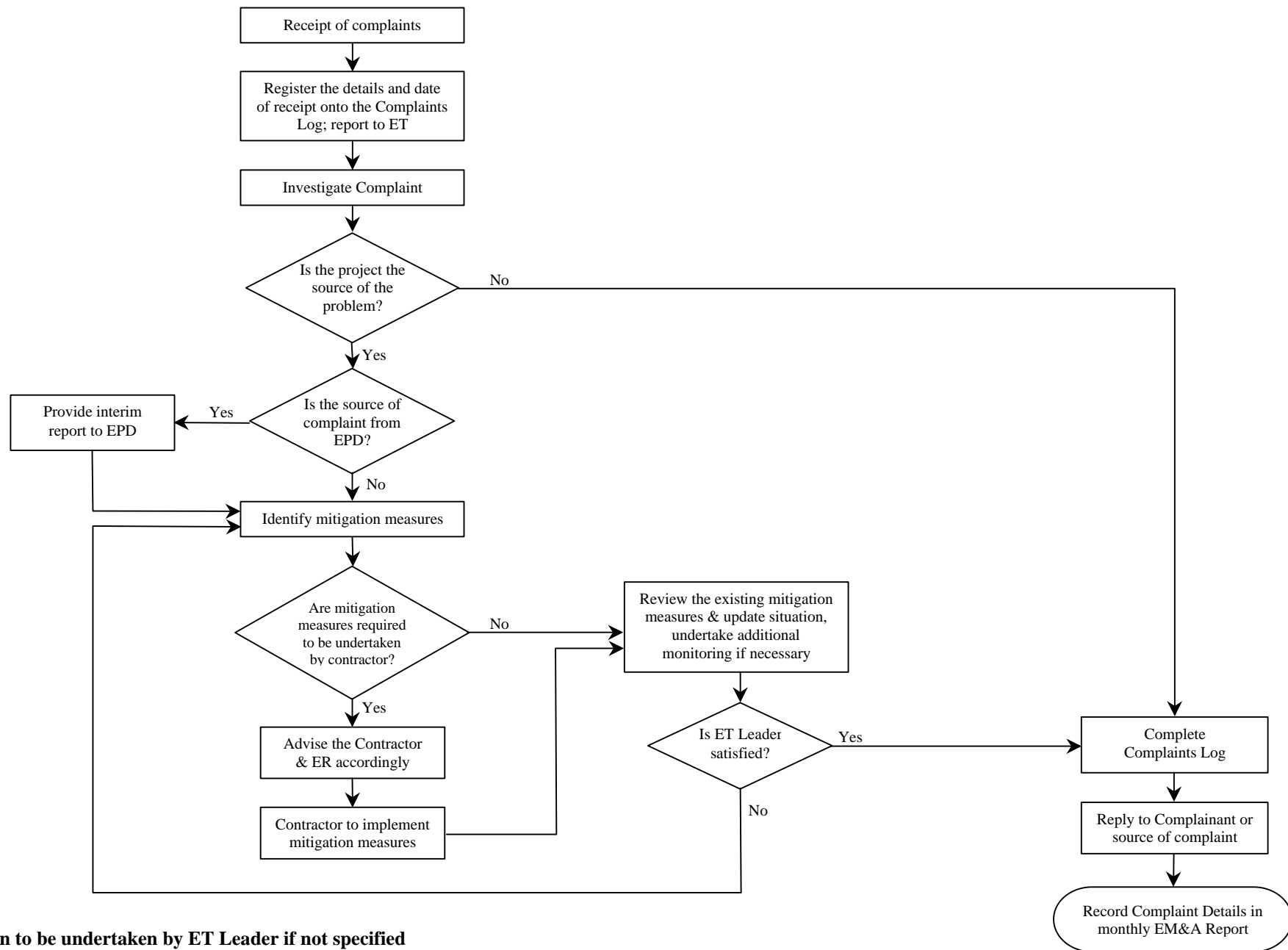
FIGURE NUMBER
Figure 1.1

STAGE CODE
P 0

FILE NAME	CADD DATE
SCALE	1:2000 in A3
SHEET NO	
STAGE CODE	P 0



▲					▲					DESIGNED BY	AY	DRAWING TITLE	Project Organisation	FILE NAME		CADD DATE		
▲					▲					DRAWN BY	AY			SCALE	NTS			
▲					▲					CHECKED BY	FC			FIGURE NUMBER				
▲					▲					IN CHARGE	ST			Figure 1.2				
▲					▲					DATE				SHEET NO	STAGE CODE	REV		
REV	DATE	BY	SUB	APP	DESCRIPTION	REV	DATE	BY	SUB	APP	DESCRIPTION	The Decommissioning of Underground Fuel Tanks at Tsuen Wan No.1 Pumping Station Environmental Impact Assessment					P	0



Note: Action to be undertaken by ET Leader if not specified

△						△						DESIGNED BY	AY
△						△						DRAWN BY	AY
△						△						CHECKED BY	FC
△						△						IN CHARGE	ST
△						△						DATE	
REV	DATE	BY	SUB	APP	DESCRIPTION	REV	DATE	BY	SUB	APP	DESCRIPTION	DATE	

DRAWING TITLE

Complaint Response Procedure

ARUP

Ove Arup & Partners
Hong Kong Limited

PROJECT TITLE
The Decommissioning of Underground Fuel Tanks at
Tsuen Wan No.1 Pumping Station
Environmental Impact Assessment

FILE NAME	CADD DATE
SCALE	NTS
FIGURE NUMBER	Figure 8.1
SHEET NO	STAGE CODE REV
	P 0

APPENDIX 1 - Implementation Schedule

APPENDIX 2 - Sample Data Sheets of Monitoring

Noise Monitoring Field Record Sheet

Monitoring Location		
Description of Location		
Date of Monitoring		
Measurement Start Time (hh:mm)		
Measurement Time Length (min.)		
Noise Meter Model/Identification		
Calibrator Model/Identification		
Measurement Results	L ₉₀ (dB(A))	
	L ₁₀ (dB(A))	
	Leq (dB(A))	
Major Construction Noise Source(s) During Monitoring		
Other Noise Source(s) During Monitoring		
Remarks		

Name & Designation

Signature

Date

Recorded By :

Checked By :

APPENDIX 3 - Proposed Noise Monitoring Locations

APPENDIX 4 - Sample of Complaints Proforma

Complaint Proforma

Division/Department:		Date:	Ref:
Project:			Job No.:
COMPLAINANT			
Name:		Address:	
Tel:			
Fax:			
COMPLAINT INVESTIGATION			
Item	Description (cause of impact, type of impact and location, etc.)		
CORRECTIVE & PREVENTIVE ACTION(S)			
Action #	Proposed Action to be taken		To be completed by/on
Prepared by:			
Name:		Signature:	Date:
<u>FOLLOW UP ACTION(S)</u>			
Confirmed by:			
Name:		Signature:	Date:
ATTACHMENTS:			