

**JOB No.: TCS00862/17**



**CEDD Contract CV/2016/08 –  
Queen's Hill Development - Sewage Pumping Station  
Works**

**CONTAMINATION ASSESSMENT PLAN (CAP)**

**PREPARED FOR**

**CHINA GEO-ENGINEERING CORPORATION**

**Quality Index**

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## 1 INTRODUCTION

- 1.1 **China Geo-Engineering Corporation** (hereinafter ‘the Main Contractor’) has been awarded CEDD Contract CV/2016/08 – Queen's Hill Development - Sewage Pumping Station Works (the Project) in January 2017. The Project is part of the proposed Infrastructural Works for Proposed Developments at Queen’s Hill (QH), Fanling. The purpose of the Project is to construct and operate a sewage pumping station at Lung Ma Road to cope with sewerage needs of the planned developments at Queen’s Hill development site (QHD).
- 1.2 The Project site is located near Ma Liu Shui San Tsuen at Queen’s Hill, which is currently occupied by few scattered village houses. It is located within “Government, Institution or Community” (G/IC) zone on the Lung Yeuk Tau & Kwan Tei South Outline Zoning Plan (OZP) No. S/NE-LYT/16. The site area is approximately 1,500 m<sup>2</sup>. Location of the Project is enclosed in **Appendix A**. General layout plan and details of the design are shown in **Appendix B**.
- 1.3 Since the proposed Queen’s Hill Sewage Pumping Station (QHSPS) will have an installed capacity of more than 2000 m<sup>3</sup> per day and the clearance between the existing/planned residential area and planned education institution will be less than 150m, it is classified as Designated Project under F.3(b) of Part I, Schedule 2 of Environmental Impact Assessment Ordinance (EIAO).
- 1.4 According to QHSPS Project Profile (PP), inspection of site walkover was conducted to identify any potential lands contamination site on 1 April 2015. Land uses included substation and the suspected car park/workshop were identified could potentially cause land contamination due to past and/or present activities within these facilities. Since these two potential sites were not accessible at the time of PP preparation, a further site appraisal is needed to be conducted before any construction works commenced.
- 1.5 The Main Contractor appointed Action-United Environmental Services & Consulting (hereinafter referred to “AUES”) as the Land Contamination Specialist to carry out land contamination assessment including relevant report submission and supervise site investigation. Furthermore, ALS Technichem (HK) Pty Ltd of HOKLAS laboratory will be responsible to conduct chemical analysis.
- 1.6 According to Condition 2.1 of the Environmental Permit No. EP-506/2016, land contamination assessment to the two concerned sites (CLP’s substation and suspected car park workshop near Ma Liu Shiu Shan Tsuen at Queen’s Hill) shall be carried out when access to the sites is available and before the commencement of construction of the Project. This Contamination Assessment Plan (CAP) is developed in accordance with the EPD current contamination assessment guidelines as below:
- “Guidance Note for Contaminated Land Assessment and Remediation” as issued by EPD on 15 August 2007;
  - “Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management” as issued by EPD on December 2007; and
  - “Practice Guide for Investigation and Remediation of Contaminated Land” dated August 2011.
- 1.7 Based on EPD requirements, all the information including site background, site geology and hydrogeology, proposed sampling and testing methodology, borehole/groundwater monitoring well locations, QA/QC procedures and time schedule, has been provided in this CAP.
- 1.8 The tentative schedule of site investigation (SI) would be undertaken for about two weeks. A Contamination Assessment Report (CAR) or/with Remediation Action Plan (RAP) (if remediation is required) will be submitted to EPD within two months after completion of site investigation work.

### PLAN STRUCTURE

**Section 1** Introduction

**Section 2** General Information of the Designated Assessment Sites

<i>Section 3</i>	Sampling Locations and Methodology
<i>Section 4</i>	Quality Auditing (QA) and Quality Checking (QC) Procedure
<i>Section 5</i>	Health and Safety
<i>Section 6</i>	Reporting

## **2 GENERAL INFORMATION OF THE DESIGNATED ASSESSMENT SITES**

### **ASSESSMENT SITE –SUBSTATION AND SUSPECTED CAR PARK/WORKSHOP**

- 2.1 According to *Section 4.2.7 of the Queen's Hill Sewage Pumping Station Project Profile*, historical land use of the proposed Project Site should be agricultural land use. The existing substation was noted in the aerial photograph in 1977 while the suspected car park/ workshop was noted in the aerial photograph in 1992. The remaining areas appeared to be used only as Lung Ma Road, village houses or vegetated land, and no significant change was observed from 1992 to 2014. The location of designated potential contamination areas are showed in **Appendix B** and representative historical aerial photographs of the Project Site areas extracted from the Project Profile are enclosed in **Appendix C**.
- 2.2 During the preparation stage of Project Profile, a site walkover was conducted and site appraisal could not be carried out at the substation and the suspected car park/ workshop due to inaccessibility. A further site appraisal was carried out by AUES on 13 February 2017.

#### Observation During Site Visit at Substation

- 2.3 Existing building for keeping the equipment and transformers of the substation is observed. As confirmed by the representative of China Light & Power Limited, no existing underground oil/petroleum storage tank was installed within the substation site. Surface of the existing ground was kept as concrete paved and no sign of land contamination was found on the concrete surface.

#### Observation During Site Visit at suspected Car Park/ Workshop

- 2.4 Surface of existing ground of the car workshop was partly covered by steel plates. Obvious oil stains were observed at the suspected car park/workshop. In addition, some lube oil empty bottles were found on site. Chemical including machine oil, lube oil and solvent were observed disposed at the existing ground. No designated location or proper facilities for chemical storage.

### **WASTE MANAGEMENT OF THE ASSESSMENT SITES**

- 2.5 No chemical waste was generated from the substation as no registration record was found in the EPD's registry of chemical waste producer for the substation. For the suspected car park/workshop, the worker claimed that all chemical wastes generated from the workshop were properly disposed by licenced waste collector. However, no disposal record was provided by the occupier. No information regarding the chemical waste producer registration for the suspected car park/workshop was found. Photographs taken on 13 February 2017 during site visit is shown in **Appendix D**. A Site Walkover Checklist is shown in **Appendix G**.

### **ACCIDENT OF SPILLAGE/LEAKAGE OF THE CHEMICAL WASTE AND DG RECORD**

- 2.6 No record regarding any accident that involved spillage/leakage of chemical waste nor Dangerous Goods (DG) storage and incidents of spillage/leakage of DG was found for both the substation and suspected car park/workshop according to the response of Fire Service Department (FSD) and Environmental Protection Department (EPD). Although the response from FSD and EPD are only updated to May/June 2015, it is anticipate that no new potential sources (e.g. DG storage, spillage/leakage of chemicals and chemical waste generation, etc.) in the assessment sites during the intervening period based on the observation of the site inspection and interview with the occupiers of the assessment sites. Supporting information was shown in **Appendix I**.

## **SITE GEOLOGY AND HYDROGEOLOGY**

### **Geology**

- 2.7 The assessment site is situated near Ma Liu Shui San Tsuen at Queen's Hill, New Territories.
- 2.8 Fanling formation occurs almost exclusively in onshore areas of Hong Kong where its main areas of development are in the northern New Territories on the Fanling and Yuen Long plains. The Formation is a mixed alluvial and colluvial formation of Holocene age. Alluvial components of the formation mainly occur in low-lying areas whereas colluvium is largely distributed on more steeply sloping ground. However, the alluvium and colluvium merge laterally and interdigitate, especially at the bases of slopes adjacent to floodplains.
- 2.9 Alluvial deposits of the formation typically consist of well-sorted to semi-sorted clay, silt, sand and gravel. Consistency is generally soft to firm, with many coarser deposits being loose and unstable in vertical sections. The colour usually ranges from light grey in areas of higher water table, indicating mild reducing conditions, to yellowish brown, indicating oxidising conditions above the permanent water table.
- 2.10 The Holocene colluvial deposits are generally poorly sorted and commonly comprise a light yellowish brown, slightly clayey sandy silt to gravelly silty sand matrix containing subangular to angular slightly decomposed boulders with thin weathering rinds a few millimetres thick. The grain size typically varies with the topography, parent rock type and distance transported from source.

### **Hydrogeology**

- 2.11 Ng Tung River is located at North side of the potential contamination assessment sites. Ng Tung River is a major network of drainage lines toward Sham Chun River as collected surface runoff from North New Territories. According to Hong Kong Observatory Ta Kwu Ling Station ([http://www.hko.gov.hk/cis/region\\_climat/TKL/TKL\\_mean\\_e.htm](http://www.hko.gov.hk/cis/region_climat/TKL/TKL_mean_e.htm)), average year rainfall recorded between 1986 and 2016 at Fanling is about 1,858.8mm. Moreover, GEO Ground Investigation Report No.00735 (Site Investigation Report of Fanling & Shek Wu Hui Development) shown that the groundwater level is about 1.75m below ground level. The hydrogeology (groundwater depth and flow direction) of the assessment areas will be assessed during the site investigation, if there is any contaminant found on site the potential migration of the contaminant will be reported in the Contamination Assessment Report (CAR).

### 3 SAMPLING LOCATIONS AND METHODOLOGY

- 3.1 According to *Queen's Hill Sewage Pumping Station Project Profile*, site appraisal should be carried out within the substation and the suspected car park/ workshop when site access is available before any construction works commence to confirm the presence and, if any, extent of contamination. If contamination is identified, a detailed land contamination assessment should be submitted to EPD for approval. The land contamination assessment will be undertaken based on the following documents:
- “*Guidance Note for Contaminated Land Assessment and Remediation*” issued by EPD on 15 August 2007; and
  - “*Guidance Manual for Use of Risk-based Remediation Goals for Contaminated Land Management*” issued by EPD in December 2007; and
  - “*Practice Guide for Investigation and Remediation of Contaminated Land*” issued by EPD in August 2011;

#### PROPOSED SAMPLING LOCATION

- 3.2 The land contamination assessment in this CAP only covered part of the concerned sites which fall within the site boundary of the Sewage Pumping Station Works. As no construction works would be carried out outside the site boundary of the Sewage Pumping Station Works, land contamination assessment will not be conducted for the concerned site areas outside the site boundary under this Project. The demarcation of these areas of the concerned sites within and outside the site boundary of the Sewage Pumping Station Works has been shown in the **Appendices B, D, and E**. The concerned site areas outside the site boundary under this Project (the orange areas in the in the **Appendices B, D, and E**) are out of the scope of this project and will not be covered in this land contamination assessment. If these area are required for other future projects by other parties, it will be their responsibility to carry out the land contamination assessment at the areas.

#### *Substation*

- 3.3 According to the site observation on 13 February 2017, ground surface of the substation was paved with concrete and no temporary storage of chemical bottles was observed (see Photo 2 to 5 of **Appendix D**). No sign of land contamination was observed on site. Considering the risk of contaminating the land by the operation of substation should be very low and the area of the substation site within the project site boundary is approximately 127m<sup>2</sup>, three sampling points are proposed at the substation by using square grid 7 meters which also fulfill the minimum number of sampling points stated in “*Practice Guide for Investigation and Remediation of Contaminated Land*”.

#### *Suspected Car Park/Workshop*

- 3.4 Based on site visit on 13 February 2017, several lube empty bottles observed was temporary stored on site (see Photo 10 of **Appendix D**). Moreover, obvious oil stains was observed at the suspected car park/workshop (see Photos 10 of **Appendix D**). In addition, chemicals i.e. lube oil empty bottles and general wastes were found on site (see Photos 9 to 11 of **Appendix D**). The site area of the suspected car park/workshop within the project boundary is approximately 333m<sup>2</sup> and three grid sampling locations (Sampling ID SSP-2-1, SSP-02-3 and SSP-02-5) were proposed by using square grid 13 meters. Additional two hotspot sampling locations including the location where lube oil empty bottles temporary storage area was found (Sampling ID SSP-02-2, Photo 9 shown in **Appendix D**) and near the entrance where oil stain (Sampling ID SSP-02-4, Photo 10 shown in **Appendix D**) was observed were proposed.
- 3.5 The coordinates of the proposed sampling points at the two potential contamination areas are listed in **Table 3-1** and is shown in **Appendix E**.

**Table 3-1 Summarize of the Proposed Sampling Points at the Two Potential Contamination Areas**

Potential Contamination Area	Sampling Point ID	Co-ordinates		Location of Sampling Point	Proposed Sampling Depth	Termination Depth	Chemicals of Concern (COCs)	Rationale of Proposed Sampling Location
		Easting	Northing					
CLP Substation	SPS-01-1	833 945	840760	Open area at West of the Switch Panel Room	Below ground level 0.5m, 1.5m and 3.0m	Below ground level 3.0m	<p><b>Metals</b> – Arsenic, Cadmium, Chromium III &amp; VI, Mercury and Nickel</p> <p><b>Petroleum Carbon Ranges</b> – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35</p>	The sampling location SPS-01-1, SPS-01-2 and SPS-01-3 were proposed by using Square Grid Pattern with square size 7 meters as shown in Appendix E due to no hotspot was identified.
	SPS-01-2	833 945	840 766	Open area at Southwest of the Switch Panel Room	Below ground level 0.5m, 1.5m and 3.0m	Below ground level 3.0m	<p><b>Volatile Organic Compounds (VOCs)</b> – Benzene, Toluene, Ethylbenzene and Xylenes (Total).</p> <p><b>Semi-volatile Organic Compounds (SVOCs)</b> – Phenol and Naphthalene.</p>	
	SPS-01-3	833 953	840 763	Open area near the site entrance	Below ground level 0.5m, 1.5m and 3.0m	Below ground level 3.0m	<p><b>Polychlorinated Biphenyls (PCBs)</b></p>	
Suspected Car Park/ Workshop	SPS-02-1	834 004	840 741	General refuse storage area	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m	<p><b>Metals</b> – Antimony, Arsenic, Barium, Cadmium, Chromium III &amp; VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc</p> <p><b>Petroleum Carbon Ranges</b> – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35</p>	



Potential Contamination Area	Sampling Point ID	Co-ordinates		Location of Sampling Point	Proposed Sampling Depth	Termination Depth	Chemicals of Concern (COCs)	Rationale of Proposed Sampling Location
		Easting	Northing					
	SPS-02-2	834 013	840 740	Lube oil empty bottles temporary storage location	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m	<p><b>Volatile Organic Compounds (VOCs)</b> – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;</p> <p><b>Semi-volatile Organic Compounds (SVOCs)</b>– Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene and Pyrene.</p> <p><b>Polychlorinated Biphenyls (PCBs)</b></p>	<p>The sampling location SPS-02-1, SPS-02-3 and SPS-02-5 were proposed by using Square Grid Pattern with square size 13 meters as shown in Appendix E.</p> <p>Moreover, two additional hot sampling location SPS-02-2 and SPS-02-4 were proposed due to lube oil empty bottles and oil stain were observed during site inspection.</p>
	SPS-02-3	834 012	840 729	Southern part of the site	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m		
	SPS-02-4	834 004	840 733	Near the entrance of the site	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m		
	SPS-02-5	834 019	840 725	Southeast corner of the site	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m		

- 3.6 Pit excavation will be used to conduct soil sampling at the substation and both pit excavation and borehole dry drilling will be used to conduct soil sampling at the suspected carpark/workshop. At each sampling location at the substation, soil samples will be collected at 0.5m, 1.5m and 3.0m below ground level while soil samples will be collected at 0.5m, 1.5m and 4.5m below ground level at each sampling location at the suspected carpark/workshop. If groundwater is encountered at sampling pits, groundwater samples will be collected for the assessment.
- 3.7 If contaminant is revealed during site investigation, additional samples would be collected to estimate the extension of soil contamination.

#### **POTENTIAL CONTAMINANTS**

- 3.8 Chemical analysis for land contamination assessment would be carried out in accordance with Table 2-2 of Section 2 of the “*Practice Guide for Investigation and Remediation of Contaminated Land*”.

#### ***Substation (China Light & Power Limited)***

- 3.9 Due to the subject area was a substation and only transformer operation was took place in the past. In according with the “*Practice Guide for Investigation and Remediation of Contaminated Land*” of chemicals concern, contaminants analysis is proposed as follow:
- Metals – Arsenic, Cadmium, Chromium III & VI, Mercury and Nickel; and
  - Petroleum Carbon Ranges – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35; and
  - Volatile Organic Compounds (VOCs) – Benzene, Toluene, Ethylbenzene and Xylenes (Total).
  - Semi-volatile Organic Compounds (SVOCs) – Phenol and Naphthalene.
  - Polychlorinated Biphenyls (PCBs)

#### ***Suspected Car Park/ Workshop***

- 3.10 Obvious oil stain and some lube oil empty bottles were observed on site. Furthermore, the site may be contaminated with PCBs as coming from equipment. According to the findings and in accordance with the “*Practice Guide for Investigation and Remediation of Contaminated Land*”, the chemical analysis is therefore proposed for the suspected car park/workshop as follows:
- Metals – Antimony, Arsenic, Barium, Cadmium, Chromium III & VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc; and
  - Petroleum Carbon Ranges – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35; and
  - Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;
  - Semi-volatile Organic Compounds (SVOCs)– Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene and Pyrene.
  - Polychlorinated Biphenyls (PCBs)

#### **PIT EXCAVATION AND BOREHOLE DRY DRILLING**

- 3.11 During sampling, AUES’s specialist will monitor ensure that no cross contamination or any other forms of interferences to the environmental site assessment is resulted from the borehole dry drilling and trial pit excavation operation.
- 3.12 The advancement of drill hole will be undertaken using a dual-tube or a hollow-stem auger equipped drilling rig. The boreholes will enable soil samples to be collected and also allow standpipes to be installed for groundwater monitoring. Pit excavation will be conducted from ground surface to 1.2 m below ground level (bgl) by hand digging at all boreholes at the suspected carpark/workshop prior to dry drilling to ensure the location was free of subsurface underground utilities.

- 3.13 In the course of pit excavation, soil samples will be collected by hand tools at the substation and will be collected below the concrete cover and at 1 m deep at the suspected carpark/workshop. The drilling of boreholes at the suspected carpark/workshop will start from 1.2 m bgl and undisturbed soil samples will be collected with a thin-wall sampler at the depth. Additional samples will be collected at depths where changes in soil strata or notable changes in soil properties are observed.

#### **SOIL SAMPLING METHODOLOGY**

- 3.14 Soil samples will be taken from the proposed sampling points. Samples will be taken on wall side and in vertical profiles from the ground surface to final depths below the ground level. At each sampling location, sub-samples will be obtained for initial screening below surface ground at 0.5m, 1.0m, 1.5m, 2.0m and each metre thereafter with additional samples obtained at changes in soil strata or notable changes in soil properties.
- 3.15 During the drilling of each borehole, soil samples will be collected from continuous cores and inspected for any visual and olfactory signs of contamination. Soil texture classification log, photo-ionization detection (PID) measurements for headspace vapor concentrations and selected for laboratory analysis will be undertaken by the land contamination specialist. A summary of sampling activities and procedures is presented as follows:
- a) Identify the sampling locations;
  - b) At each identified sampling point, trial pit will be adopted for safety reason for underground utilities checking.
  - c) Rotary drilling rig will be used for drilling and coring of samples after utilities checking;
  - d) Samples will be collected and stored for field screening and laboratory analysis in an appropriately prepared and labeled sampling container and plastic bags provided by the laboratory.
  - e) All samples will be field-screened to determine the maximum contaminant concentrations and the vertical extent of contamination where possible, by:
    - Photo-ionization detection (PID) reading; and
    - Supported by subjective assessment of headspace vapor concentrations.
  - f) At least three (3) soil samples will be taken within the high potential contaminated layer of soil at each borehole location for laboratory analysis.
  - g) Each sub-sample collected will be put into a sample container or high-density polyethylene bag provided by the HOKLAS laboratory. All samples will be stored in a cool box maintained at a temperature of 4°C without being frozen.
- 3.16 A Chain-Of-Custody (COC) protocol will be followed as part of QA/QC procedures and the completed COC forms will be delivered to the laboratory together with the samples for testing. Samples will be analyzed within 2 days of delivery or within the holding time as advised by the laboratory. Duplicate sample will also be taken at a frequency of 1 per every 20 samples.
- 3.17 Every sample container will carry a unique label containing the following information:
- Project title;
  - Unique label number;
  - Sampling date;
  - Sampling interval length;
  - Location number;
  - Sampling depth; and
  - Sample description.
- 3.18 All excavation pits will be logged. Information will include the following:
- Sampling point identification;
  - Site sketch showing sample locations and measured distances;
  - Actual depth of samples collected;
  - Depth of the water table measured during sampling if groundwater present;
  - Date and time of sample collection;
  - Sample identification number;

- Description of sample condition such as soil type, colour, odour and staining, if present;
- Presence of free products in underground water if any; and
- Description of soil strata.

**SOIL SAMPLE ANALYSIS**

3.19 All samples and duplicate samples will be delivered to the HOKLAS-accredited laboratory for the chemical testing. As per the “*Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management*” requirements, all chemical analysis methods used for soil assessment should be accredited under HOKLAS. The chemicals analysis method and the reporting limits are shown in *Table 3-2*.

**Table 3-2 Testing Method and Reporting Limit of the Chemical Analysis- Soil Sample**

Parameter	Methods	Reporting Limit (mg/kg)
a) Metals	USEPA 6020	
• Antimony		1
• Arsenic		1
• Barium		1
• Cadmium		0.2
• Chromium III & VI		1
• Cobalt		1
• Copper		1
• Lead		1
• Manganese		1
• Mercury		0.2
• Molybdenum		1
• Nickel		1
• Tin		1
• Zinc	1	
b) Petroleum Carbon Ranges	USEPA 8015	
• C6 – C8		5
• C9 – C16		200
• C17 – C35		500
c) Volatile Organic Compounds (VOCs)	USEPA 8260	
• Acetone		50
• Benzene		0.2
• Toluene		0.5
• Ethylbenzene		0.5
• Xylenes (total)		2
• Methyl tert-Butyl Ether		0.5
• Trichloroethene	0.1	
d) Semi-volatile Organic Compounds (SVOCs)	USEPA 8270	
• Acenaphthene		0.5
• Acenaphthylene		0.5
• Anthracene		0.5
• Benzo(a)anthracene		0.5
• Benzo(a)pyrene		0.5
• Benzo(b)fluoranthene		0.5
• Benzo(g,h,i)perylene		0.5
• Benzo(k)fluoranthene		0.5
• Chrysene		0.5
• Dibenzo(a,h)anthracene		0.5
• Fluoranthene		0.5
• Fluorene		0.5
• Indeno(1,2,3-cd)pyrene		0.5
• Naphthalene		0.5
• Phenanthrene		0.5
• Phenol		0.5
• Pyrene	0.5	

Parameter	Methods	Reporting Limit (mg/kg)
e) Polychlorinated Biphenyls (PCBs)	USEPA8270	0.1

- 3.20 Extra soil samples will be stored and tested for Toxicity Characteristics Leaching Procedure (TCLP) of full suite of parameters if excavation and landfill disposal is indicated as last resort of remediation method. As advised by the Testing Laboratory (ALS), samples for TCLP analysis shall be undertaken within three months, if necessary.

**MONITORING WELL LOCATIONS**

- 3.21 Monitoring well installation will be used for groundwater sampling. The groundwater well will be constructed at the soil pits or drill holes if groundwater observed during soil sampling process. Therefore, eight (8) groundwater wells are predicted to be installed for groundwater sampling on site. If any soil pits or drill holes has not encountered groundwater during soil sampling, then no groundwater well will be installation to carry out water sampling and it will be grouted of reinstate. Location of proposed groundwater wells is same as soil sampling location shown in *Appendix E*.

**MONITORING WELL INSTALLATION AND CONSTRUCTION**

- 3.22 Groundwater monitoring wells will be installed after the pit excavation at the nominated soil pits at substation or dry drilling works completed at the nominated soil-boring holes at the suspected carpark/workshop. The casing for construction of monitoring well is minimum 100mm in diameter. The PVC pipe is 50mm in diameter, jointed flush, threaded class 18uPVC with machine slotted sections (0.5 mm slot aperture). All joints make use of threaded casing and no solvent welding will be employed.
- 3.23 The well screen will be installed minimum 0.5m above the water table till more than 3.0m below the top of the water table to cater for seasonal fluctuations of the groundwater table. The bottom end of casing will be fitted with an end-cap to minimize up surging materials entering the well.
- 3.24 A filter pack comprising of 1mm to 2mm size of clean coarse sand will be used. The filter pack will start from the base of the screen to 0.5m above the termination of the slotted casing. A bentonite plug comprising pellet bentonite will be placed above the clean coarse sand layer to a minimum thickness of 300 mm. Above the bentonite plug, grout comprising a mixture of cement, bentonite and potable water will be used to seal the bore to the ground surface. All wells will be completed with concrete from 0.3m below ground surface. The wellheads are in form of manhole cover. All wellheads were marked with unique monitoring well numbers. The typical drawing of groundwater monitoring well is shown in *Appendix H*.

**GROUNDWATER SAMPLING METHODOLOGY**

- 3.25 Upon completion of well installation and construction, the groundwater monitor wells will be developed as follows.

***Monitoring Well Cleaning***

- 3.26 Cleaning of the monitoring wells will be carried out to remove silt and drilling fluid residue from the wells with the use of a vacuum pump.

***Groundwater Gauging***

- 3.27 Groundwater gauging will be conducted to determine the representative groundwater flow direction. The well elevations and locations will be surveyed using the standard surveying method (ie. Hong Kong Grid Coordinates and mPD level of ground surface). Subsequent to surveying, groundwater level and thickness of free product layer, if present, will be measured by an interface probe. Well headspace vapour concentrations will be measured using a PID.

***Groundwater Sampling***

- 3.28 Groundwater will be sampled after installation and development of the monitoring wells. Prior to groundwater sampling, the wells will be purged to remove at least 5 well volumes of stagnant water from the wells in order to collect representative groundwater samples. Prior to sampling, at

least three consecutive stable readings of temperature, electrical conductivity and pH value will be obtained. The purging and groundwater sampling will be undertaken from surface to 2.0m below the groundwater level with the use of a Teflon/stainless steel bailer or a mechanical pump.

- 3.29 Between sampling events, all equipment used will be thoroughly decontaminated with laboratory-grade detergent followed by demonized water.
- 3.30 All groundwater samples collected will be treated and preserved in the identical manner as that for soil samples. All laboratory QA/QC and chain of custody procedures will be properly followed.

**GROUNDWATER SAMPLE ANALYSIS**

- 3.31 Groundwater samples will be delivered to laboratory within 24 hours and analyzed within 2 days of delivery or within the holding time as advised by the laboratory. As per the “*Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management*” requirements, all chemical analysis methods used for groundwater assessment should be accredited under HOKLAS. The chemicals analysis method and the reporting limits are shown in **Table 3-3**.

**Table 3-3 Testing Method and Reporting Limit of the Chemical Analysis – Groundwater Sample**

Parameter	Methods	Reporting Limit (µg/L)
a) Petroleum Carbon Ranges <ul style="list-style-type: none"> <li>• C6 – C8</li> <li>• C9 – C16</li> <li>• C17 – C35</li> </ul>	USEPA 8015	20 500 500
b) Volatile Organic Compounds (VOCs) <ul style="list-style-type: none"> <li>• Acetone</li> <li>• Benzene</li> <li>• Toluene</li> <li>• Ethylbenzene</li> <li>• Xylenes (total)</li> <li>• Methyl tert-Butyl Ether</li> <li>• Trichloroethene</li> </ul>	USEPA 8260	500 5 5 5 20 5 5
c) Semi-volatile Organic Compounds (SVOCs) <ul style="list-style-type: none"> <li>• Acenaphthene</li> <li>• Acenaphthylene</li> <li>• Anthracene</li> <li>• Benzo(b)fluoranthene</li> <li>• Chrysene</li> <li>• Fluoranthene</li> <li>• Fluorene</li> <li>• Naphthalene</li> <li>• Phenanthrene</li> <li>• Pyrene</li> </ul>	USEPA 8270	2 2 2 1 1 2 2 2 2 2
d) Polychlorinated Biphenyls (PCBs)	USEPA8270	1
e) Metals <ul style="list-style-type: none"> <li>• Mercury</li> </ul>	USEPA 6020	0.5

**ASSESSMENT GUIDELINES**

3.32 According to the Project Profile, sewage pumping station would be constructed and operated at the potential land contamination sites. Therefore, “Industrial” land use scenario of Risk-based Remediation Goals (RBRGs) is recommended as assessment criteria.

3.33 The soil and groundwater to be evaluated the industrial of RBRGs are listed in *Table 3-4*.

**Table 3-4 Industrial of Risk-based Remediation Goals limits for Soil and Groundwater**

Parameter	Soil		Groundwater		
	Industrial (mg/kg)	Soil Saturation Limit $C_{sat}$ (mg/kg)	Industrial (mg/L)	Solubility Limit (mg/L)	
<b>Metals</b>	Antimony (Sb)	2.61E+02	NA	NA	NA
	Arsenic (As)	1.96E+02	NA	NA	NA
	Barium (Ba)	1.00E+04*	NA	NA	NA
	Cadmium (Cd)	6.53E+02	NA	NA	NA
	Chromium III	1.00E+04*	NA	NA	NA
	Chromium VI	1.96E+03	NA	NA	NA
	Cobalt (Co)	1.00E+04*	NA	NA	NA
	Copper (Cu)	1.00E+04*	NA	NA	NA
	Lead (Pb)	2.29E+03	NA	NA	NA
	Manganese (Mn)	1.00E+04*	NA	NA	NA
	Mercury (Hg)	3.84E+01	NA	6.79E+00	NA
	Molybdenum (Mo)	3.26E+03	NA	NA	NA
	Nickel (Ni)	1.00E+04*	NA	NA	NA
	Tin (Sn)	1.00E+04*	Na	NA	NA
Zinc (Zn)	1.00E+04*	NA	NA	NA	
<b>Petroleum Carbon Ranges</b>	C6 – C8	1.00E+04*	1.00E+03	1.15E+03	5.23E+00
	C9 – C16	1.00E+04*	3.00E+03	9.98E+03	2.80E+00
	C17 – C35	1.00E+04*	5.00E+03	1.78E+02	2.80E+00
<b>Volatile Organic Compounds (VOCs)</b>	Acetone	1.00E+04*	***	1.00E+04*	***
	Benzene	9.21E+00	3.36E+02	5.40E+01	1.75E+03
	Toluene	1.00E+04*	2.35E+02	1.00E+04*	5.26E+02
	Ethylbenzene	8.24E+03	1.38E+02	1.00E+04*	1.69E+02
	Xylenes (total)	1.23E+03	1.50E+02	1.57E+03	1.75E+02
	Methyl tert-Butyl Ether	7.01E+01	2.38E+03	1.81E+03	***
	Trichloroethene	5.68E+00	4.88E+02	1.42E+01	1.10E+03
<b>Semi-Volatile Organic Compounds (SVOCs)</b>	Acenaphthene	1.00E+04*	6.02E+01	1.00E+04*	4.24E+00
	Acenaphthylene	1.00E+04*	1.98E+01	1.00E+04*	3.93E+00
	Anthracene	1.00E+04*	2.56E+00	1.00E+04*	4.34E-02
	Benzo(a)anthracene	9.18E+01	NA	NA	NA
	Benzo(a)pyrene	9.18E+00	NA	NA	NA
	Benzo(b)fluoranthene	1.78E+01	NA	7.53E+00	1.50E-03
	Benzo(g,h,i)perylene	1.00E+04*	NA	NA	NA
	Benzo(k)fluoranthene	9.18E+02	NA	NA	NA
	Chrysene	1.14E+03	NA	8.12E+02	1.60E-03
	Dibenzo(a,h)anthracene	9.18E+00	NA	NA	NA
	Fluoranthene	1.00E+04*	NA	1.00E+04*	2.06E-01
	Fluorene	1.00E+04*	5.47E+01	1.00E+04*	1.98E+00
	Indeno(1,2,3-cd)pyrene	9.18E+01	NA	NA	NA
	Naphthalene	4.53E+02	1.25E+02	8.62E+02	3.10E+01
	Phenanthrene	1.00E+04*	2.80E+01	1.00E+04*	1.00E+00
Phenol	1.00E+04*	7.26E+03	NA	NA	
Pyrene	1.00E+04*	NA	1.00E+04*	1.35E-01	
<b>Polychlorinated Biphenyls (PCBs)</b>		7.48E-01	NA	5.11E+00	3.10E-02

Remark:

(\*) indicates a 'ceiling limit' concentration.

(\*\*\*) indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies



## 4 QA/QC PROCEDURES

- 4.1 The quality control samples will be collected in the course of soil and groundwater sampling. Trip blank, field blank and duplicate samples will be taken for soil and groundwater samples.

### *Trip/Travel Blank*

- 4.2 The trip blank will be prepared in the laboratory using organic-free water. The trip blank will remain unopened and accompanied from the start of sampling to delivery of samples to the laboratory. The trip blank for soil and groundwater samples will be tested with Volatile Organic Compounds (VOCs) listed in Table 3-2 and Table 3-3 respectively to verify any airborne contamination during transportation. The trip blank would be collect and analysis for each soil and groundwater samples delivery event. Number of trip blank depends on number of soil and groundwater delivery trips.

### *Field Blank*

- 4.3 The field blank will be prepared in field using organic-free water by passing the water from a full bottle to an empty bottle at the most contaminated location on site. The field blank accompanied the project samples to the laboratory and the field blank for soil and groundwater samples will be tested with Volatile Organic Compounds (VOCs) listed in Table 3-2 and Table 3-3 respectively to verify any airborne contamination from the assessment sites. One field blank will be collected for every twenty soil or groundwater samples. Number of field blank sample collection depends on the number of soil and groundwater samples to be collected.

### *Duplicate Sample*

- 4.4 The duplicate sample(s) will be collected as a split sample from soil and groundwater sample. Chemical analysis is equivalent to the original sample(s). These samples will be delivered to the laboratory as two individual samples without any indication to the laboratory that they have been duplicated. One duplicate sample will be collected for every twenty soil or groundwater samples. According to the estimated numbers of soil and groundwater samples to be collected from the project site, two duplicate soil samples and one duplicate groundwater sample are predicted to be collected.

## **PROCEDURE FOR DECONTAMINATING EQUIPMENT AND SAMPLING TOOLS**

- 4.5 Tap water, phosphate-free detergent (Decon<sup>®</sup> 90) and distilled water will be used for cleaning the digging and sampling tools/equipment. The decontamination is required to be conducted as follows:
- All sampling tools/equipment decontamination will be perform before each sampling pit excavation to ensure no cross contamination;
  - All sampling tools/equipment will be decontaminated before next sampling to prevent cross-contamination of samples; and
  - All sampling tools/equipment will be decontaminated before leaving the potential contaminated areas to prevent potentially contaminated soil or water being transported off-site.
- 4.6 The land contamination specialist or his delegates will supervise all the decontamination work.
- 4.7 Furthermore, equipment blank will be collected to determine potential cross contamination between samples and potential influences from the sampling tools used. It will be collected from assessment site by the sampling tools/equipment rinse to verify the decontamination procedures and background or ambient airborne contaminants on the site. The equipment blank collection will be one per every twenty soil and groundwater samples. According to the estimated numbers of groundwater samples to be collected from the project site, two equipment blank samples for soil and one equipment blank sample for groundwater are predicted to be collected.
- 4.8 According to above procedures, Table 4-1 summarised the QA/QC sample(s) collection.

**Table 4-1 QA/QC Sample(s) Collection**

QA/QC Sample(s) to be collected from the site	Matrix	Chemical Testing	(Proposed Numbers of Sample: 24 soil and 8 water samples)
Trip Blank	Soil	Volatile Organic Compounds (VOCs)	Depends on the number of delivery event
	Water		Depends on the number of delivery event
Field Blank	Soil	Volatile Organic Compounds (VOCs)	2
	Water		1
Duplicate Sample	Soil	Same with original sample	2
	Water		1
Equipment Blank	Soil	Full chemical analysis	2
	Water		1

## **5 HEALTH AND SAFETY**

5.1 In general, all personnel who are involved in carrying out site investigation works shall comply with the in-house health and safety precautions listed below:

- All site personnel will possess an approved Construction Industry Safety Training Certificate (Green Card);
- Safety helmets, safety boots, gloves and protective clothing will be provided to all personnel working on site;
- Eye and ear protector will be provided for concrete layer breaking;
- Briefing on health and safety requirements will be provided to the site personnel for daily before the SI works;
- No food, drink, alcohol or drugs will be consumed whilst conducting the SI works on site;
- Direct skin contact with the contaminated materials will be avoided;
- Hand-wash basins will be provided and made accessible to all personnel working for the captioned site SI works;
- The land contamination specialist will be responsible for project implementation. The specialist will also supervise SI work on site.

5.2 The details of Health and Safety Plan (HASP) are shown in *Appendix F*.

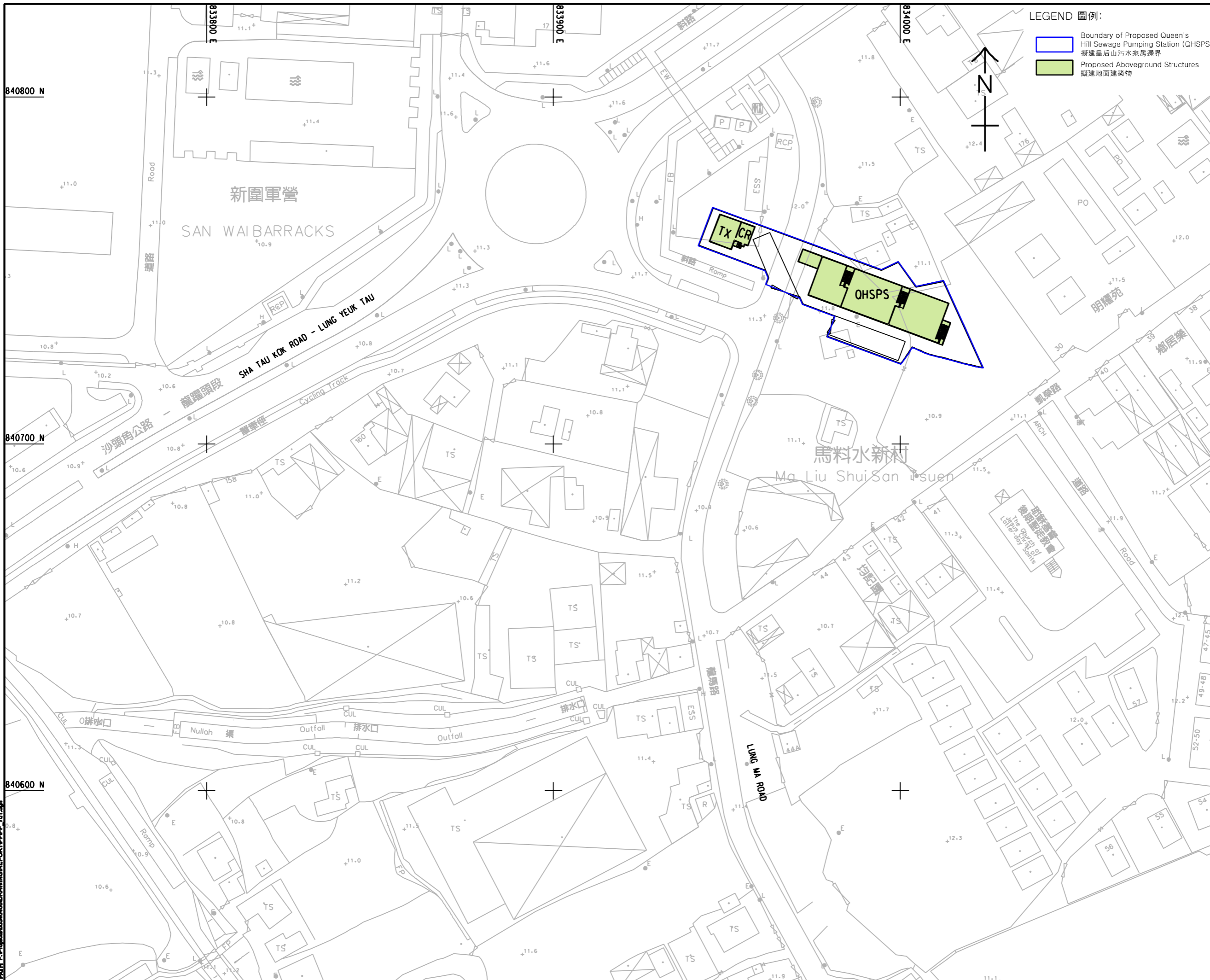
## 6 REPORTING

- 6.1 Upon completion of the site investigation (SI) works, a Contamination Assessment Report (CAR) will be prepared base on the findings of the SI. The chemical analysis results of the sampled soil and groundwater will be assessed in compliance with the requirements set out in the “*Guidance Note for Contaminated Land Assessment and Remediation*” and the “*Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management*”, issued by EPD.
- 6.2 If any assessment area is identified with soil/groundwater contamination, remediation should be proposed to clean up the contaminated area. A Remediation Action Plan (RAP), if necessary, combined with CAR would be submitted to EPD for approval. After the remediation work, a Remediation Report (RR) would be prepared and submitted to EPD.
- 6.3 Meanwhile, no construction works shall be started at the contaminated area before the completion of the remediation works and the approval of the corresponding Remediation Report.

**Appendix A**

**THE PROJECT LAYOUT PLAN**

ISO A1 841mm x 641mm  
 Approved:  
 Checked:  
 Designer:  
 Project Management Initials:  
 201606  
 P:\16\201606\20160603\DRAWING\REPORT\PPPP\_701.dwg



**LEGEND 圖例:**

- Boundary of Proposed Queen's Hill Sewage Pumping Station (QHSPS)  
擬建皇后山污水泵房邊界
- Proposed Aboveground Structures  
擬建地面建築物

**AECOM**

**PROJECT**  
 Infrastructural Works for Proposed Developments at Queen's Hill, Fanling - Investigation, Design and Construction  
 粉嶺皇后山發展之基礎設施工程 - 勘查研究、設計及建造

**CLIENT**  
 土木工程拓展署  
**CEDD** Civil Engineering and Development Department

**CONSULTANT**  
 AECOM Asia Company Ltd.  
 艾奕康有限公司  
 www.aecom.com

**SUB-CONSULTANTS**

**ISSUE/REVISION**

NO.	DATE	DESCRIPTION	CHK.

**STATUS**

**SCALE**  
A1:500

**DIMENSION UNIT**  
METRES

**KEY PLAN**

**PROJECT NO.**  
60340456

**CONTRACT NO.**  
CE 63/2014 (CE)

**SHEET TITLE**  
Site Location Plan  
工地位置圖

**SHEET NUMBER**  
60340456/PP/FIGURE 1.1  
圖 1.1

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## **Appendix B**

### **THE DESIGNATED POTENTIAL CONTAMINATION AREA**

Project Management Initials:   
 Designer: YHH Checked: SCWC Approved: RCYK ISO A1 84mm x 61mm

Pdf File by: CHENWK 2016/08  
 D:\TH\_Export\60340456\dwg\contract\c21000\c2\_1003.dwg



- NOTES:**
- THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60340456/02/1003 TO 1004.
  - THE BOUNDARIES OF THE SITE ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL SEEK CONFIRMATION FROM THE PROJECT MANAGER OF EXACT BOUNDARIES ON SITE WHERE NECESSARY.

- LEGEND:**
- [Symbol: Dashed line] SITE BOUNDARY
  - [Symbol: Dotted pattern] PUBLIC ACCESS TO BE MAINTAINED UNDER CONTRACT NO. CV/2016/08
  - [Symbol: Cross-hatch pattern] PUBLIC ACCESS TO BE MAINTAINED UNDER CONTRACT NO. CV/2016/07
  - [Symbol: '+' pattern] WORKS AREA A
  - [Symbol: Diagonal lines /] WORKS AREA B
  - [Symbol: 'x' pattern] PORTION X
  - [Symbol: 'v' pattern] PORTION Y
  - [Symbol: Diagonal lines \] PORTION M
  - [Symbol: Dotted pattern] PORTION ZA
  - [Symbol: Dotted pattern] PORTION ZB
  - [Symbol: Blue fill] POTENTIAL CONTAMINATION AREAS OF THE CONCERNED SITES FALL WITHIN THE SITE BOUNDARY OF SEWAGE PUMPING STATION WORKS
  - [Symbol: Orange fill] POTENTIAL CONTAMINATION AREAS OF THE CONCERNED SITES FALL OUTSIDE THE SITE BOUNDARY OF SEWAGE PUMPING STATION WORKS

**PROJECT NO.**  
**INFRASTRUCTURAL WORKS FOR PROPOSED DEVELOPMENTS AT QUEEN'S HILL - FANLING - INVESTIGATION, DESIGN AND CONSTRUCTION**

**CONTRACT TITLE**  
**QUEEN'S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS**

**CLIENT**  
 土木工程發展署  
**CEDD** Civil Engineering and Development Department

**CONSULTANT**  
 2016/08

**ISSUE/REVISION**

NO.	DATE	DESCRIPTION	CHK

**STATUS**

SETTING OUT POINTS		
POINTS	EASTING	NORTHING
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102	834023.942	840721.864
103	834014.924	840724.064
104	834008.423	840725.729
105	834003.479	840727.745
106	834000.186	840722.993
107	833978.984	840730.866
108	833971.858	840740.231
109	833971.071	840741.950
110	833961.227	840745.934
111	833958.118	840746.786
112	833959.230	840756.840
113	833942.391	840758.974
114	833936.192	840755.031
115	833933.966	840756.480
116	833932.910	840758.667
117	833935.240	840759.880
118	833932.943	840769.039
119	833935.880	840770.930
120	833945.836	840768.250
121	833962.180	840788.740
122	833960.077	840765.095
123	833994.486	840752.320
124	833998.232	840754.116
125	834004.588	840745.360

**SCALE** 1:250 **DIMENSION UNIT** METRES  
**KEY PLAN**

**PROJECT NO.** 60340456 **CONTRACT NO.** CV/2016/08

**SHEET TITLE**  
**POTENTIAL CONTAMINATION AREAS UNDER THE PROJECT**

**SHEET NUMBER**

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## **Appendix C**

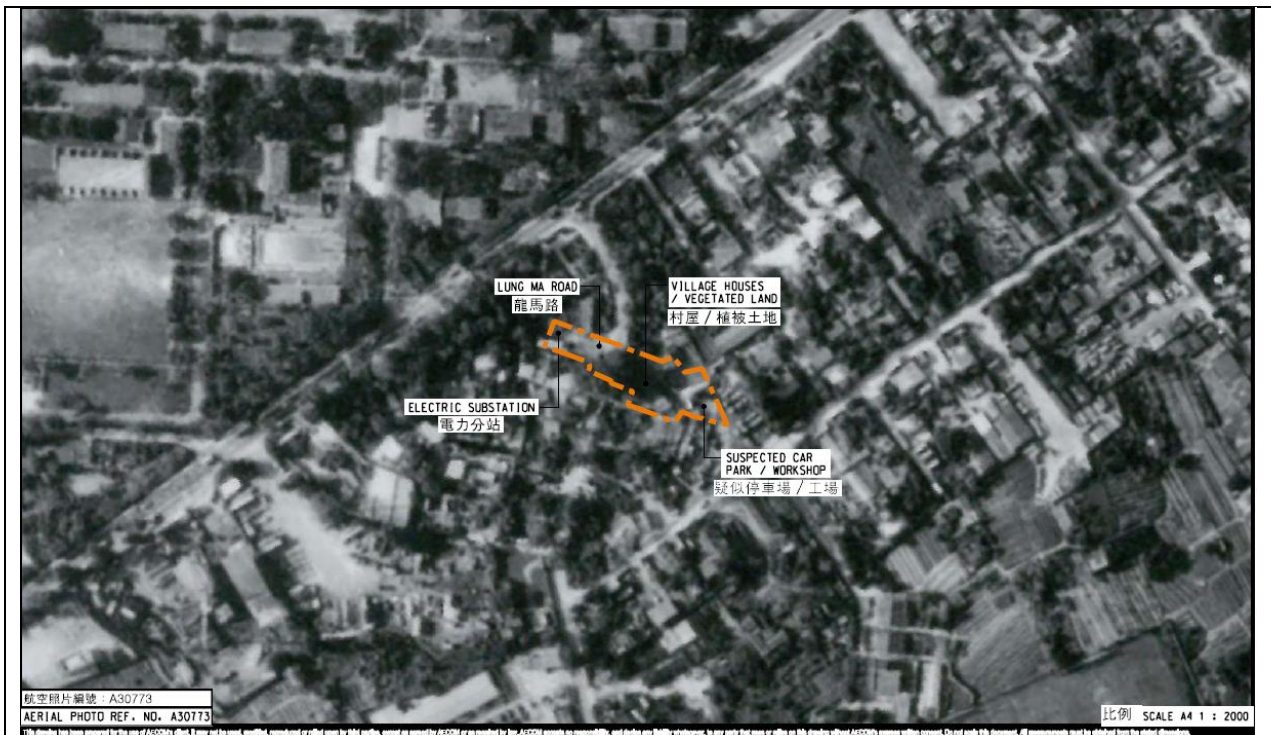
### **REPRESENTATIVE HISTORICAL AERIAL PHOTOGRAPHS (Extracted From Project Profile)**



Aerial Photo (1964)



Aerial Photo (1977)

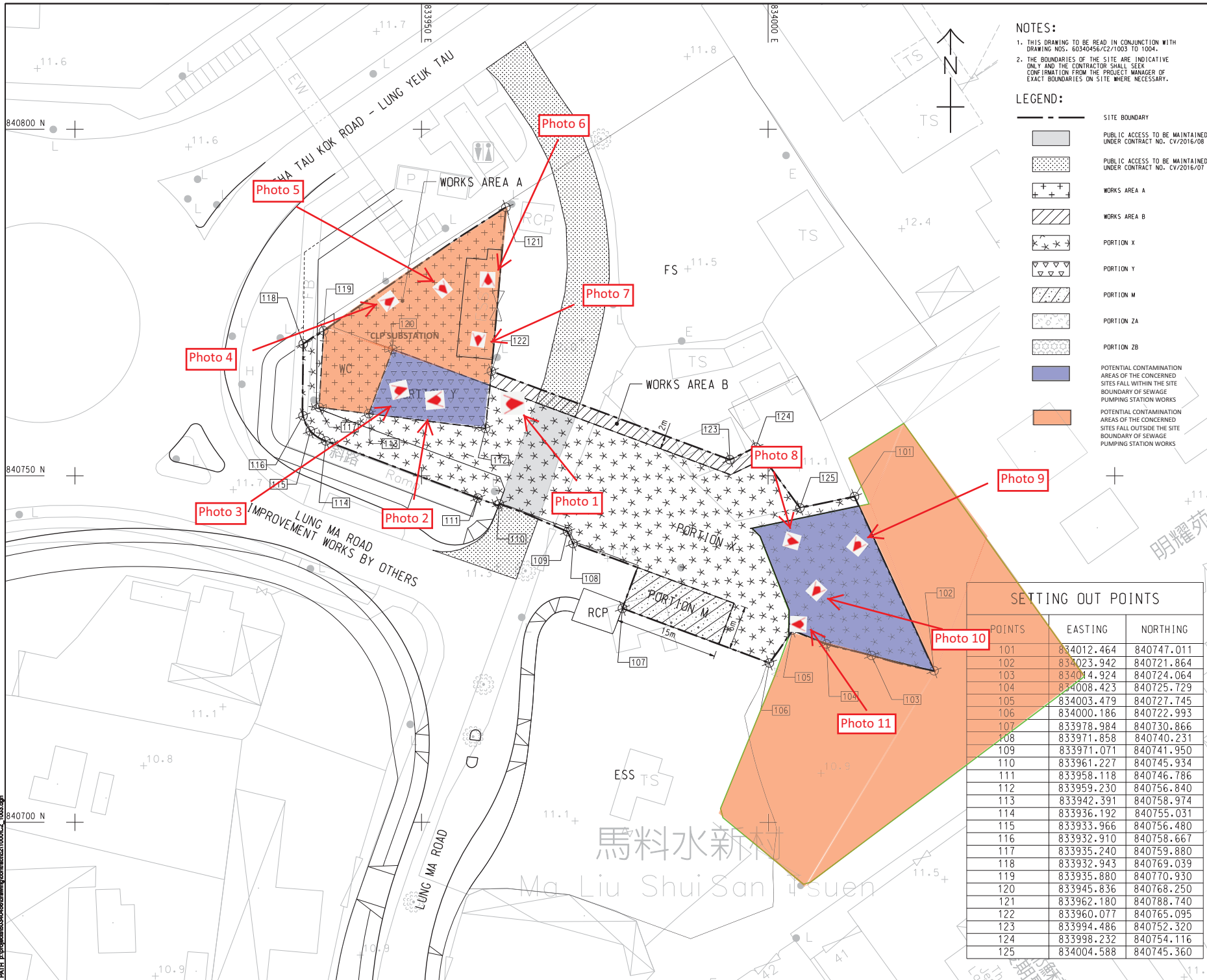


Aerial Photo (1992)



Aerial Photo (2014)

**Appendix D**  
**PHOTOGRAPH RECORD**



**NOTES:**

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60340456/21/003 TO 1004.
2. THE BOUNDARIES OF THE SITE ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL SEEK CONFIRMATION FROM THE PROJECT MANAGER OF EXACT BOUNDARIES ON SITE WHERE NECESSARY.

**LEGEND:**

- SITE BOUNDARY
- [Pattern] PUBLIC ACCESS TO BE MAINTAINED UNDER CONTRACT NO. CV/2016/08
- [Pattern] PUBLIC ACCESS TO BE MAINTAINED UNDER CONTRACT NO. CV/2016/07
- [Pattern] WORKS AREA A
- [Pattern] WORKS AREA B
- [Pattern] PORTION X
- [Pattern] PORTION Y
- [Pattern] PORTION M
- [Pattern] PORTION ZA
- [Pattern] PORTION ZB
- [Pattern] POTENTIAL CONTAMINATION AREAS OF THE CONCERNED SITES FALL WITHIN THE SITE BOUNDARY OF SEWAGE PUMPING STATION WORKS
- [Pattern] POTENTIAL CONTAMINATION AREAS OF THE CONCERNED SITES FALL OUTSIDE THE SITE BOUNDARY OF SEWAGE PUMPING STATION WORKS

**SETTING OUT POINTS**

POINTS	EASTING	NORTHING
101	834012.464	840747.011
102	834023.942	840721.864
103	834014.924	840724.064
104	834008.423	840725.729
105	834003.479	840727.745
106	834000.186	840722.993
107	833978.984	840730.866
108	833971.858	840740.231
109	833971.071	840741.950
110	833961.227	840745.934
111	833958.118	840746.786
112	833959.230	840756.840
113	833942.391	840758.974
114	833936.192	840755.031
115	833933.966	840756.480
116	833932.910	840758.667
117	833935.240	840759.880
118	833932.943	840769.039
119	833935.880	840770.930
120	833945.836	840768.250
121	833962.180	840788.740
122	833960.077	840765.095
123	833994.486	840752.320
124	833998.232	840754.116
125	834004.588	840745.360

**PROJECT NO.**  
**INFRASTRUCTURAL WORKS FOR PROPOSED DEVELOPMENTS AT QUEEN'S HILL - FANLING - INVESTIGATION, DESIGN AND CONSTRUCTION**  
**CONTRACT TITLE**  
**QUEEN'S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS**  
**CLIENT**  
 土木工程發展署  
**CEDD** Civil Engineering and Development Department

**CONSULTANT**  
**CHENWK**

**ISSUE/REVISION**

NO.	DATE	DESCRIPTION	CHK.

**STATUS**

**SCALE**  
A1 : 250  
**DIMENSION UNIT**  
METRES

**KEY PLAN**

**PROJECT NO.**  
60340456  
**CONTRACT NO.**  
CV/2016/08

**SHEET TITLE**  
**POTENTIAL CONTAMINATION AREAS UNDER THE PROJECT**

**SHEET NUMBER**

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**Substation (China Light & Power Limited)**



Photo 1 – Substation Exit/Entrance



Photo 2 – Open area at the substation



Photo 3 –Open area at the substation



Photo 4 –Open area at the substation

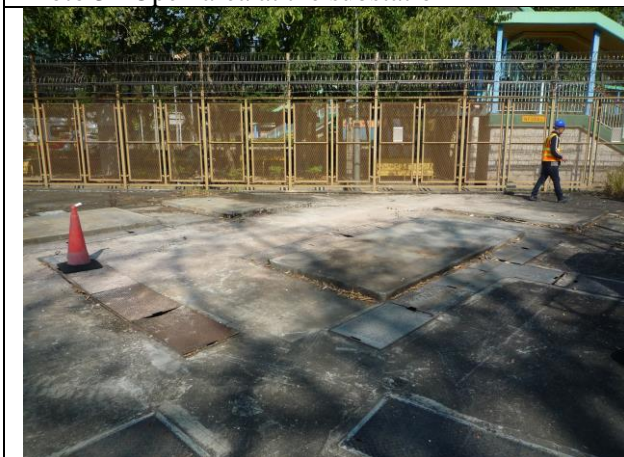


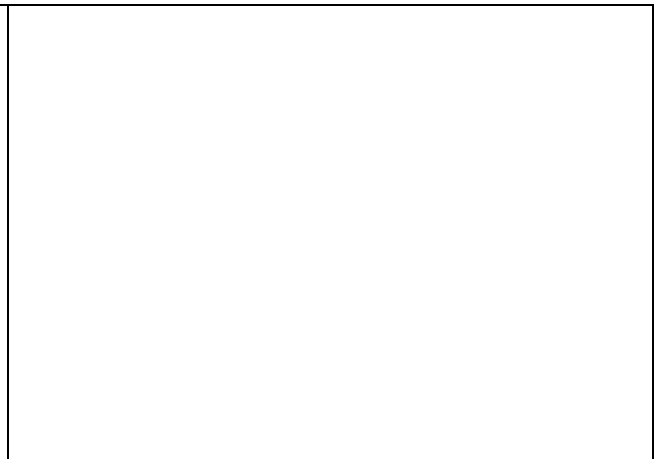
Photo 5 –Open area at the substation



Photo 6 – Switch Panel Room at the substation



Photo 7 – Switch Panel Room at the substation



**Suspected Car Park/Workshop**



Photo 8 – General refuse observed at suspected car park/workshop.



Photo 9 – Lube oil empty bottles observed at suspected car park/workshop.



Photo 10 – Oil stain observed at car workshop near entrance.

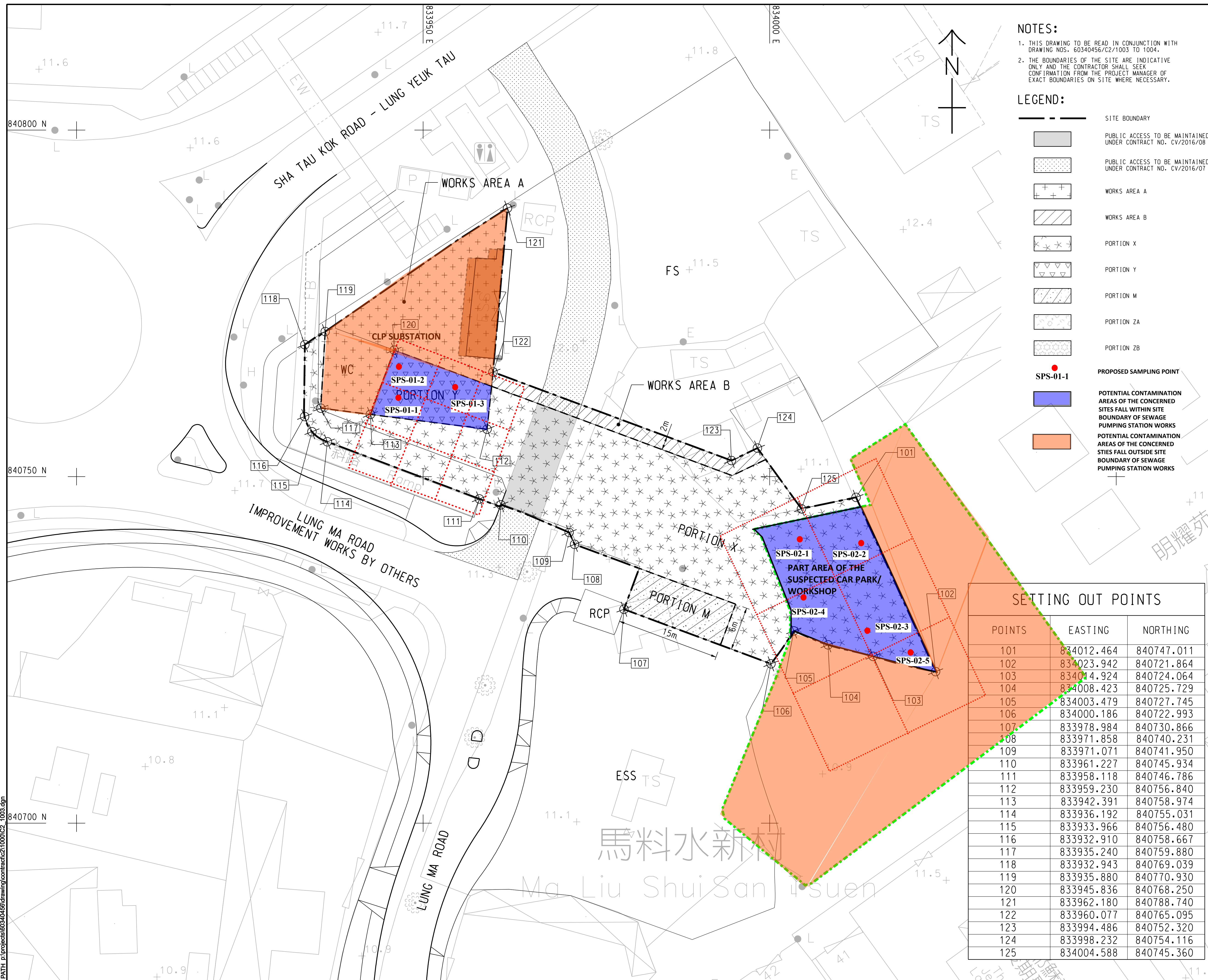


Photo 11 – Material storage on site.

## **Appendix E**

### **PROPOSED SOIL SAMPLING LOCATION**





**NOTES:**  
 1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60340456/C2/1003 TO 1004.  
 2. THE BOUNDARIES OF THE SITE ARE INDICATIVE ONLY AND THE CONTRACTOR SHALL SEEK CONFIRMATION FROM THE PROJECT MANAGER OF EXACT BOUNDARIES ON SITE WHERE NECESSARY.

- LEGEND:**
- SITE BOUNDARY
  - PUBLIC ACCESS TO BE MAINTAINED UNDER CONTRACT NO. CV/2016/08
  - PUBLIC ACCESS TO BE MAINTAINED UNDER CONTRACT NO. CV/2016/07
  - WORKS AREA A
  - WORKS AREA B
  - PORTION X
  - PORTION Y
  - PORTION M
  - PORTION ZA
  - PORTION ZB
  - SPS-01-1 PROPOSED SAMPLING POINT
  - POTENTIAL CONTAMINATION AREAS OF THE CONCERNED SITES FALL WITHIN SITE BOUNDARY OF SEWAGE PUMPING STATION WORKS
  - POTENTIAL CONTAMINATION AREAS OF THE CONCERNED SITES FALL OUTSIDE SITE BOUNDARY OF SEWAGE PUMPING STATION WORKS

**SETTING OUT POINTS**

POINTS	EASTING	NORTHING
101	834012.464	840747.011
102	834023.942	840721.864
103	834014.924	840724.064
104	834008.423	840725.729
105	834003.479	840727.745
106	834000.186	840722.993
107	833978.984	840730.866
108	833971.858	840740.231
109	833971.071	840741.950
110	833961.227	840745.934
111	833958.118	840746.786
112	833959.230	840756.840
113	833942.391	840758.974
114	833936.192	840755.031
115	833933.966	840756.480
116	833932.910	840758.667
117	833935.240	840759.880
118	833932.943	840769.039
119	833935.880	840770.930
120	833945.836	840768.250
121	833962.180	840788.740
122	833960.077	840765.095
123	833994.486	840752.320
124	833998.232	840754.116
125	834004.588	840745.360

**PROJECT**  
 項目  
**INFRASTRUCTURAL WORKS FOR PROPOSED DEVELOPMENTS AT QUEEN'S HILL, FANLING - INVESTIGATION, DESIGN AND CONSTRUCTION**  
 CONTRACT TITLE  
 QUEEN'S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS

**CLIENT**  
 業主  
 土木工程拓展署  
 Civil Engineering and Development Department

**CONSULTANT**  
 工程顧問公司

**ISSUE/REVISION**  
 修訂

I/R	DATE	DESCRIPTION	CHK.

**STATUS**  
 階段

**SCALE**  
 比例  
 A1 1 : 250

**DIMENSION UNIT**  
 尺寸單位  
 METRES

**KEY PLAN**  
 索引圖

**PROJECT NO.**  
 項目編號  
 60340456

**CONTRACT NO.**  
 合約編號  
 CV/2016/08

**SHEET TITLE**  
 圖紙名稱  
**POTENTIAL CONTAMINATION AREAS UNDER THE PROJECT**

**SHEET NUMBER**  
 圖紙編號

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馬料水新村  
 Ma Liu Shui San Tsuen

## **Appendix F**

### **HEALTH AND SAFETY PLAN**

## Health And Safety Plan (HASP) of Land Contamination Assessment Work

- 1 **Project Description:** The assessment is intended to determine whether the sites is contaminated and if so assess the extent of contamination before commencement of any major works on site. The work will involve collection and analysis of representative soil and groundwater samples.
- 2 **Site History:** The existing substation was noted in the aerial photograph in 1977 while the suspected car park/ workshop was noted in the aerial photograph in 1992. The subject site before 1977 should be farmland.
- 3 **H&S Hazards:**
  - Supervision of SI work: (inhalation of contaminants, eye irritation, noise nuisance, body injury by equipment, muscle fatigue by prolonged standing, mosquito borne diseases, sunstroke due to hot weather)
  - On-Site Assessment: (inhalation of contaminant, poisoning by ingestion, eye irritation, muscle fatigue by prolonged standing, mosquito borne diseases, sunstroke due to hot weather)
  - On-Site Sampling: (inhalation of contaminants, eye irritation, poisoning by ingestion, muscle fatigue by prolonged standing, mental stress by repetitive movement, mosquito borne diseases, sunstroke due to hot weather)
  - In-Situ Measurement: (inhalation of contaminants, poisoning by ingestion, eye irritation, body injury by equipment, muscle fatigue by prolonged standing, mental stress by repetitive movement, mosquito borne diseases, sunstroke due to hot weather)
- 4 **Key Personnel:**
  - Ben Tam (Land Contamination Specialist)
  - Martin Tse (China Geo-Engineering Corporation)
- 5 **Receptor** The worker
- 6 **Level of Protection:** Level 2\*
  - Hard hat;
  - Safety shoes;
  - Eye Protector;
  - Ear Protector;
  - Full protective clothing;
  - Respirator; and
  - Rubber glove.

\* *Depending on actual site conditions, the assessment specialist will determine and see if the protection level can be adjusted.*
- 7 **Decontamination Procedures:** The decontamination procedures will be implemented in accordance with the final approved Contaminated Assessment Plan (CAP).
- 8 **Designation Work Areas** The assessment works will be carried out in accordance with the final approved Contaminated Assessment Plan (CAP).
- 9 **Types & Levels of Expected Contamination:** Potential contamination may relate to products available at the assessment area including BTEX, TPH, PAHs and Heavy metals. Significant of other contaminant is not expected on site.

---

## **Health And Safety Plan (HASP) of Land Contamination Assessment Work**

- 10 **Monitoring Requirements:** Potential contamination on site is monitored by Photo-Ionizing Detector (PID) as well as visual inspection by qualified assessor.
- 11 **Emergency Phone No:**
- Police: 999 or Sheung Shui Division (Tel: 3661 1672)
  - Fire: Sheung Shui Fire Station (Tel:2670 7682)
  - Hospital: North District Hospital: (Tel: 2683 8888)
- 12 **Location & Routes to the Nearest Medical Facility:** Fanling Ambulance Depot (Tel: 2669 2250)

## **Appendix G**

### **SITE WALKOVER CHECKLIST**

**Location: Suspected Car Park/ Workshop**

**Date of site visit: 13 February 2017**

**GENERAL SITE DETAILS**

Site Owner / Client:	Unknown
Property Address:	Near Ma Liu Shui San Tsuen at Queen's Hill
Person conducting the questionnaire:	Not disclosed

**SITE ACTIVITIES**

Equipment/ vehicle maintenance work

**SITE DESCRIPTION**

What is the total site area:	The total site area of the suspected car park/workshop within the project site boundary is about 333m <sup>2</sup>
What area of the site is covered by buildings (%):	0%
Please list all current and previous owners/occupiers if possible.	Previous owner could be HKSAR Government. The land is now occupied by the car workshop.
Is a site plan available? If yes, please attach	Site plan was attached in Appendix B of this CAP
Are there any other parties on site as tenants or sub-tenants?	NA
Surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.	North: San Wai Barrack South: Village houses East: Ma Liu Shui San Tsuen West: San Wai Barrack
The topography of the area	The workshop is located at flat land.
The size and location of the nearest residential communities	The nearest residential area is located at East of the site (Ma Liu Shui San Tsuen)
Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands or sites of special scientific interest?	Ng Tung River located at North of the site with approximate distance 300 meters.

## Site Walkover Checklist for Land Contamination Assessment

### Questionnaire with Existing/Previous Site Owner or Occupier

	Yes/No	Notes
1. What are the main activities/operations at the above address?	Yes	Equipment/ vehicle maintenance work
2. How long have you been occupying the site?	No	Not Clear
3. Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	No	Not Clear
4. Prior to your occupancy, who occupied the site?	No	--
5. What were the main activities/operations during their occupancy?	No	--
6. Have there been any major changes in operations carried out at the site in the last 10 years?	No	--
7. Have any polluting activities been carried out in the vicinity of the site in the past?	No	--
8. Has the site ever been used as a petrol filling station/car service garage?	No	--
9. Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	No	--
10. Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	--
11. Are any chemicals used in your daily operations? (If yes, please provide details.)	No	--
12. Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	No	
13. Has the facility produced a separate hazardous substance inventory?	No	--
14. Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	No	--
15. How many are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	No	--
16. Do you have any underground storage tanks? (If yes, please provide details.)	No	
<ul style="list-style-type: none"> <li>• How many underground storage tanks do you have on site?</li> <li>• What are the tanks constructed of?</li> <li>• What are the contents of these tanks?</li> <li>• Are the pipelines above or below ground?</li> </ul>		

## Site Walkover Checklist for Land Contamination Assessment

### Questionnaire with Existing/Previous Site Owner or Occupier

	Yes/No	Notes
<ul style="list-style-type: none"> <li>• If the pipelines are below ground, has any leak and integrity testing been performed?</li> <li>• Have there been any spills associated with these tanks?</li> </ul>		
17. Are there any disused underground storage tanks?	No	--
18. Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	No	--
19. How are the wastes disposed of?	Yes	Dispose offsite and collected by licensed waste collector.
20. Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	--
21. Have any spills occurred on site? (If yes, please provide details.) <ul style="list-style-type: none"> <li>• When did the spill occur?</li> <li>• What were the substances spilled?</li> <li>• What was the quantity of material spilled?</li> <li>• Did you notify the relevant departments of the spill?</li> <li>• What were the actions taken to clean up the spill?</li> <li>• What were the areas affected?</li> </ul>	No	
22. Do you have any records of major renovation of your site or rearrangement of underground utilities, pipe work/underground tanks (If yes, please provide details.)	No	--
23. Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	No	--
24. Are there any known contaminations on site? (If yes, please provide details.)	No	--
25. Has the site ever been remediated? (If yes, please provide details.)	No	--



## Site Walkover Checklist for Land Contamination Assessment

### Observations

	Yes/No	Notes
1. Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	No	
2. What are the conditions of the bund walls and floors?	No	
3. Are any surface water drains located near to drum storage and unloading areas?	No	--
4. Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	--
5. Is there a storage site for the wastes?	No	--
6. Is there an on-site landfill?	No	--
7. Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	--
8. Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	Yes	Oil stains was observed on the ground.
9. Are there any potential off-site sources of contamination?	No	--
10. Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	--
11. Are there any sumps, effluent pits, interceptors or lagoons on site?	No	--
12. Any noticeable odours during site walkover?	No	--
13. Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	Yes	Lubricating oils, cleaning solvent

**Location: Substation of China Light & Power Limited**

**Date of site visit: 13 February 2017**

**GENERAL SITE DETAILS**

Site Owner / Client:	China Light & Power Limited
Property Address:	Near Ma Liu Shui San Tsuen at Queen's Hill
Person conducting the questionnaire:	Not disclosed

**SITE ACTIVITIES**

Operation of transformers for transforming voltage of electricity and electricity distribution.

**SITE DESCRIPTION**

What is the total site area:	The total site area of the substation within the project site boundary is about 127m <sup>2</sup>
What area of the site is covered by buildings (%):	15%
Please list all current and previous owners/occupiers if possible.	Previous owner is HKSAR Government. The current occupier is China Light & Power Limited.
Is a site plan available? If yes, please attach	Site plan was attached in Appendix B of this CAP
Are there any other parties on site as tenants or sub-tenants?	NA
Surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.	North: San Wai Barrack South: Village houses East: Ming Yiu Yuen, Ma Liu Shui San Tsuen West: San Wai Barrack
The topography of the area	The substation is located at flat land.
The size and location of the nearest residential communities	The nearest residential area is located at East of the site (Ma Liu Shui San Tsuen)
Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands or sites of special scientific interest?	Ng Tung River located at North of the site with approximate distance 300 meters.

## Site Walkover Checklist for Land Contamination Assessment

### Questionnaire with Existing/Previous Site Owner or Occupier

	Yes/No	Notes
1. What are the main activities/operations at the above address?	Yes	Operation of transformers for transforming voltage of electricity and electricity distribution.
2. How long have you been occupying the site?	No	Not Clear
3. Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	No	Not Clear
4. Prior to your occupancy, who occupied the site?	No	--
5. What were the main activities/operations during their occupancy?	No	--
6. Have there been any major changes in operations carried out at the site in the last 10 years?	No	--
7. Have any polluting activities been carried out in the vicinity of the site in the past?	No	--
8. Has the site ever been used as a petrol filling station/car service garage?	No	--
9. Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	No	--
10. Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	--
11. Are any chemicals used in your daily operations? (If yes, please provide details.)	Yes	Transformer oil for operation of transformer.
12. Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	Yes	Updated monthly.
13. Has the facility produced a separate hazardous substance inventory?	No	--
14. Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	No	--
15. How many are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bags, silos, cisterns, vaults and cylinders)?	No	--
16. Do you have any underground storage tanks? (If yes, please provide details.)	No	--
<ul style="list-style-type: none"> <li>• How many underground storage tanks do you have on site?</li> <li>• What are the tanks constructed of?</li> <li>• What are the contents of these tanks?</li> </ul>		

## Site Walkover Checklist for Land Contamination Assessment

### Questionnaire with Existing/Previous Site Owner or Occupier

	Yes/No	Notes
<ul style="list-style-type: none"> <li>• Are the pipelines above or below ground?</li> <li>• If the pipelines are below ground, has any leak and integrity testing been performed?</li> <li>• Have there been any spills associated with these tanks?</li> </ul>		
17. Are there any disused underground storage tanks?	No	--
18. Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	No	No since no underground storage tank presented on site.
19. How are the wastes disposed of?	Yes	General refuse dispose offsite.
20. Have you ever received any notices of violation of environmental regulations or received public complaints? (If yes, please provide details.)	No	--
21. Have any spills occurred on site? (If yes, please provide details.) <ul style="list-style-type: none"> <li>• When did the spill occur?</li> <li>• What were the substances spilled?</li> <li>• What was the quantity of material spilled?</li> <li>• Did you notify the relevant departments of the spill?</li> <li>• What were the actions taken to clean up the spill?</li> <li>• What were the areas affected?</li> </ul>	No	--
22. Do you have any records of major renovation of your site or rearrangement of underground utilities, pipe work/underground tanks (If yes, please provide details.)	No	--
23. Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	No	--
24. Are there any known contaminations on site? (If yes, please provide details.)	No	--
25. Has the site ever been remediated? (If yes, please provide details.)	No	--

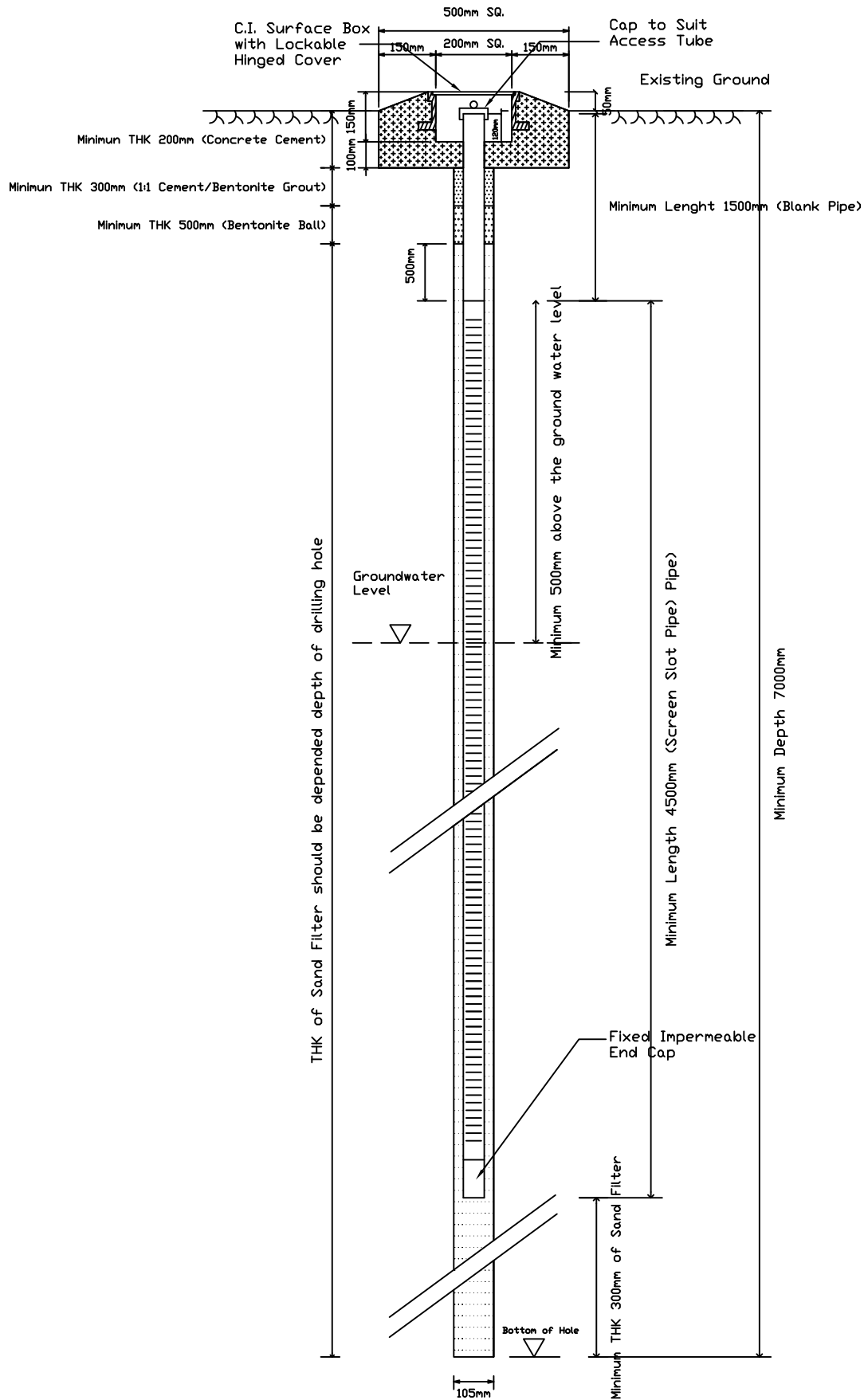
## Site Walkover Checklist for Land Contamination Assessment

### Observations

	Yes/No	Notes
1. Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	No	As confirmed, there is no any chemical storage areas on site. Moreover, no temporary chemical storage was observed during the site walkover.
2. What are the conditions of the bund walls and floors?	Yes	Concrete paved and in good condition
3. Are any surface water drains located near to drum storage and unloading areas?	No	--
4. Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	No	--
5. Is there a storage site for the wastes?	No	--
6. Is there an on-site landfill?	No	--
7. Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	--
8. Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	No	No oil stains was observed.
9. Are there any potential off-site sources of contamination?	No	--
10. Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	No	--
11. Are there any sumps, effluent pits, interceptors or lagoons on site?	No	--
12. Any noticeable odours during site walkover?	No	--
13. Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives and polyurethane foam?	Yes	Transformer oil is used to insulate and cool a transformer.

## **Appendix H**

### **Typical Drawing of Groundwater Monitoring Well**



Not to Scale

## Typical Drawing of Groundwater Well Structure

**AUES**

Well No:

Final Depth:

Reduced Level:

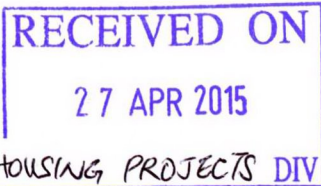
Co-ordinate

Installation Date:

## **Appendix I**

### **Supporting document related to Dangerous Goods (DG) Storage and Spillage/Leakage of chemicals**



**AECOM**

AECOM +852 3922 9000 tel  
8/F Grand Central Plaza, Tower 2 +852 3922 9797 fax  
138 Shatin Rural Committee Road  
Shatin, Hong Kong  
香港新界沙田鄉事會路138號  
新城市中央廣場第2座8樓  
www.aecom.com

Our Ref : YHH:JTKP:IYYK:ntsk:60340456/6.13-2015005493W

24 April 2015

**By Fax (2685 1133) and Post**

Environmental Protection Department  
Regional Office (North)  
10/F, Sha Tin Government Offices,  
No.1 Sheung Wo Che Road  
Sha Tin, New Territories  
Hong Kong

Dear Sir / Madam,

**Agreement No. CE 63/2014 (CE)  
Infrastructural Works for Proposed Developments at Queens's Hill, Fanling –  
Investigation, Design and Construction**

**Request for Information of Chemical Waste Producer and Chemical Spillage Accident**

AECOM Asia Co. Ltd. has been commissioned by the Civil Engineering and Development Department (CEDD) as the Consulting Engineer to undertake the captioned Project. The scope of the Project includes the carrying out of a land contamination assessment within the Study Area as indicated in the enclosed figure. The boundaries of the affect lots are also shown in the enclosed figure.

As part of the land contamination assessment and following the *Practice Guide for Investigation and Remediation of Contaminated Land* issued by Environmental Protection Department (EPD), we have to collect historical information regarding the past and present activities of the Study Area. In this regard, we would be much appreciated if you could furnish us with the following information of the Study Area for our assessment:

- Current and past (early as the records are available) registered Chemical Waste Producer(s) within the Study Area (preferably with the registration date, status (moved out or active), nature and quantity of the major chemical waste); and
- Reported accidents of spillage/leakage of chemicals within the Study Area.

Please feel free to contact our Mr. Lawrence Tso at 3922 9422 should you have any queries.

Thank you for your kind assistance.

Yours faithfully,  
For and on behalf of  
AECOM Asia Co. Ltd.



\_\_\_\_\_  
Ruby Yew  
Deputy Project Manager  
Water & Urban Development

Encl.

cc DH (PEM) - Mr. John W. H. Chung } w/encl. (Fax No. 2714 0103)

**AECOM**

**PROJECT**  
INFRASTRUCTURAL  
WORKS FOR  
PROPOSED  
DEVELOPMENTS  
AT QUEEN'S HILL,  
FANLING -  
INVESTIGATION,  
DESIGN AND  
CONSTRUCTION

**CLIENT**  
CEDD 土木工程發展署  
Civil Engineering and  
Development Department

**CONSULTANT**  
AECOM Asia Company Ltd  
www.aecom.com

**SUB-CONSULTANTS**

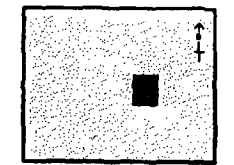
**REVISION**

NO.	DESCRIPTION	DATE

**STATUS**

**SCALE** 1:1000

**KEY PLAN**



**PROJECT NO.** 00240456

**CONTRACT NO.** CE 03/2014 (CE)

**PROJECT TITLE**  
SITE LOCATION PLAN

**PROJECT NUMBER**  
Figure 1

**LEGEND:**  
PROJECT BOUNDARY

SAN WAI BARRACKS

SHA TAU KOK ROAD - LUNG YEUK TAU

HAI WING ROAD

LUNG MA ROAD

MA LIU SHUI SAN TSUEN

Scale: 1:1000  
Date: 27/04/2015  
Drawing No: 00240456-01  
Project No: 00240456  
Contract No: CE 03/2014 (CE)  
Project Title: SITE LOCATION PLAN  
Project Number: Figure 1

Our Ref : YHH:JTKP:IYYK:ntsk:60340456/6.13-2015005492W



24 April 2015

**By Fax (2367 3631) and Post**Fire Services Department  
Licensing and Certification Command  
5/F, South Wing, Fire Services Headquarters Building  
1 Hong Chong Road  
Kowloon, Hong Kong

Dear Sir / Madam,

**Agreement No. CE 63/2014 (CE)  
Infrastructural Works for Proposed Developments at Queens's Hill, Fanling –  
Investigation, Design and Construction****Request for Information of Dangerous Goods, Chemical Spillage Accident and Fire Record**


AECOM Asia Co. Ltd. has been commissioned by the Civil Engineering and Development Department (CEDD) as the Consulting Engineer to undertake the captioned Project. The scope of the Project includes the carrying out of a land contamination assessment within the Study Area as indicated in the enclosed figure. The boundaries of the affected lots are also shown in the enclosed figure.

As part of the land contamination assessment and following the *Practice Guide for Investigation and Remediation of Contaminated Land* issued by Environmental Protection Department (EPD), we have to collect historical information regarding the past and present activities of the Study Area. In this regard, we would be much appreciated if you could furnish us with the following information of our Study Area for our assessment:

- Current and past registered Dangerous Goods storage within the Study Area (with type of dangerous goods, storage method, quantity, and licence no. / date of issue);
- Reported accidents of spillage/leakage of chemicals within the Study Area; and
- Fire records within the Study Area.

Please feel free to contact our Mr. Lawrence Tso at 3922 9422 should you have any queries.  
Thank you for your kind assistance.

Yours faithfully,  
For and on behalf of  
AECOM Asia Co. Ltd.



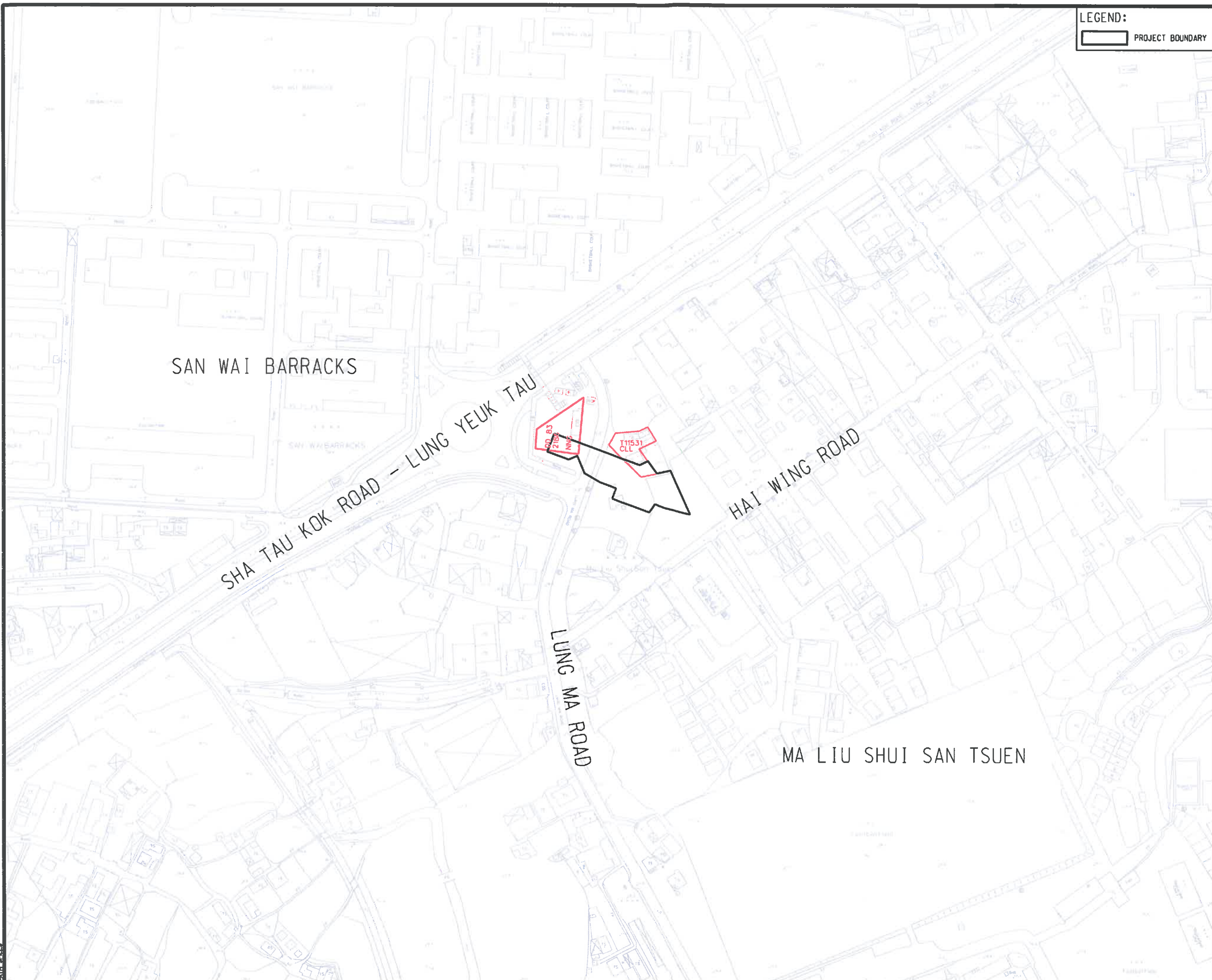
---

Ruby Yew  
Deputy Project Manager  
Water & Urban Development

Encl.

cc DH (PEM) - Mr. John W. H. Chung } w/encl. (Fax No. 2714 0103)

Plot File by: \$USERS \$DATES \$PATH \$FILE\$  
 Project Management Initials: Designer: Checkered: Approved: ISO A1 894mm x 841mm



**LEGEND:**  
 PROJECT BOUNDARY

**AECOM**  
**PROJECT**  
**INFRASTRUCTURAL WORKS FOR PROPOSED DEVELOPMENTS AT QUEEN'S HILL, FANLING - INVESTIGATION, DESIGN AND CONSTRUCTION**  
**CLIENT**

**土木工務發展署**  
**CEDD** Civil Engineering and Development Department

**CONSULTANT**  
**AECOM**  
 AECOM Asia Company Ltd.  
 www.aecom.com

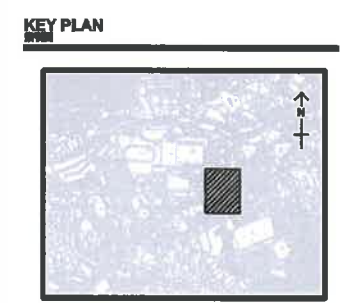
**SUB-CONSULTANTS**

**REVISION**

NO.	DATE	DESCRIPTION	CHK.

**STATUS**

**SCALE** \_\_\_\_\_ **DIMENSION UNIT** \_\_\_\_\_  
 1:1000 \_\_\_\_\_ ASSE



**PROJECT NO.** 60340456  
**CONTRACT NO.** CE 63/2014 (CE)

**SHEET TITLE**  
 SITE LOCATION PLAN

**SHEET NUMBER**  
 Figure 1

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消防處  
香港九龍尖沙咀東部康莊道1號  
消防總部大廈



FIRE SERVICES DEPARTMENT  
FIRE SERVICES HEADQUARTERS  
BUILDING,  
No.1 Hong Chong Road,  
Tsim Sha Tsui East, Kowloon.  
Hong Kong.

本處檔號 OUR REF. : (115) in FSD GR 6-5/4 R Pt. 9  
來函檔號 YOUR REF. : YHH :JTKP :IYYK :ntsk :60340456/6.13-2015005492W  
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk  
圖文傳真 FAX NO. : 2739 5879  
電話 TEL NO. : 2733 7741

3 June 2015

AECOM Asia Co. Ltd.  
8/F Grand Central Plaza, Tower 2,  
138 Shatin Rural Committee Road,  
Shatin, Hong Kong.  
**(Attn: Ms. Ruby YEW, Deputy Project Manager)**

Dear Ms. YEW,

**Infrastructural Works for Proposed Developments at Queens's Hill, Fanling.  
Investigation, Design and Construction  
Request for Information of Dangerous Goods & Incident Records**

I refer to your letter of 24.4.2015 regarding the captioned request.

Please be advised that neither records of dangerous goods license nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

Should you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(WONG Ronald)  
for Director of Fire Services

本署檔案  
OUR REF:  
來函檔案  
YOUR REF.: YHH:JTKP:LYYK:nsk:60340456/6.13W  
電話  
TEL NO: 2518 5832  
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FAX NO: 2685 1133  
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HOMEPAGE: <http://www.epd.gov.hk/>

Environmental Protection Department  
Environmental Compliance Division  
Regional Office (North)  
10/F., Sha Tin Government Offices,  
No. 1, Sheung Wo Che Road,  
Sha Tin, N.T. Hong Kong.



環境保護署  
環保法規管理科  
區域辦事處(北)  
香港新界沙田  
上禾輦路1號  
沙田政府合署10樓

(By fax only: 3922 9797)

5 May 2015

AECOM  
8/F., Grand Central Plaza, Tower 2  
138 Shatin Rural Committee Road  
Shatin, N.T.  
(Attn: Ms. Ruby YEW, Deputy Project Manager)

Dear Ms. YEW:

**Agreement No. CE 63/2014 (CE)**  
**Infrastructural Works for Proposed Developments at Queen's Hill, Fanling-**  
**Investigation, Design and Construction**  
**Request for Information about Chemical Waste Producer and Chemical Spillage Accident**

We refer to your letter dated 24 April 2015 requesting for the information of chemical waste producers and reported accidents of spillage/leakage of chemicals at the captioned site.

In so far as chemical waste producers are concerned, a registry of chemical waste producers is available in the Territory Control Office. Please contact Ms. Sandy TANG at 2835 2392 for making an appointment to view the records.

This Regional Office has no record of accidents of spillage/leakage of chemicals of the captioned location. You may need to check with other relevant parties/departments for such information as appropriate.

Should you have any query on the matter, please contact the undersigned at 2158 5832.

Yours faithfully,

(Ms Sharon TSAI)

Environmental Protection Officer  
Regional Office (North)  
For Director of Environmental Protection

cc. TCG (Attn.: Ms. Sandy TANG)

**Appendix J**  
**Response to EPD's Comment**

**Queen's Hill Sewage Pumping Station  
Land Contamination Assessment Plan (TCS00862/17/600/R0010v2) submitted on 24 February 2017  
EPD's Comments received on 31 March 2017**

<b>Item</b>	<b>EPD's comment</b>	<b>Response to comment</b>
<b><u>General Comments</u></b>		
1	Please state in the introduction that the CAP is submitted to EPD for approval as per Condition 2.1 of the Environmental Permit No. EP-506/2016.	Relevant text has been added in Section 1.6.
2	According to Condition 2.1 of the EP-506/2016, land contamination assessment to the two concerned sites (i.e. the electric sub-station and the suspected car park/workshop) shown in Figure 2 of the Permit should be carried out when access to the sites is available. The land contamination assessment in the CAP (as Appendices D and G refer) appears not covering the whole areas of the electric sub-station and the suspected car park/workshop, please clarify.	<p>The land contamination assessment in the submitted draft CAP only covered part of the concerned sites which fall within the site boundary of the Sewage Pumping Station Works. As no construction works would be carried out outside the site boundary of the Sewage Pumping Station Works, land contamination assessment will not be conducted for the concerned site areas outside the site boundary under this Project.</p> <p>The demarcation of these areas of the concerned sites within and outside the site boundary of the Sewage Pumping Station Works has been shown in the Appendices B, D, and E.</p>
<b><u>Specific Comments</u></b>		
3	There are quite a number of typos/inconsistency in the terms used in the CAP. It is the responsibility of the Project Proponent / Consultant to double-check the CAP to ensure quality and consistency before submission. Some examples are below for follow-up:	
	a) Section 2.1: Please check that there is no Section 4.27 in the Project Profile quoted.	The text 'Section 4.27' was amended as 'Section 4.2.7' in Section 2.1.
	b) Section 3.20: Please check that Appendix F referred in the last statement is the health and safety plan, not the proposed sampling locations.	Section 3.20 was revised and Appendix E should be referred instead of Appendix F for the proposed sampling locations.
	c) Section 3.31: "Detection limit" is not the appropriate term to describe the RBRG values. Please revise.	Section 3.31 was revised and the term "Detection limit" was deleted.
	d) Section 3.32: Please clarify which EIA study is referring to.	Since no EIA study was conducted for this project, Section 3.32 was revised.
	e) Table 3-4: Please check if the footnote is also applicable to the RBRG value of Copper	Footnote (*) was added to the RBRG value of Copper in Table 3-4
	f) Section 5.1 (last bullet point): Should "Land Contamination Specialist" be referred instead of "Land Contaminated Specialist"?	"Land Contaminated Specialist" was revised as "Land Contamination Specialist" in Section 5.1.
4	Section 2.5 & 2.6: Please provide the supporting information (e.g. correspondence from relevant authorities) to substantiate the assessment that no DG storage, spillage/leakage of chemicals and chemical waste generation at the assessment sites.	Supporting information for no DG storage and spillage/leakage of chemicals was provided in Appendix I. Section 2.5 & 2.6 were revised.
5	Section 3.2: It is mentioned in the site walkover checklist that transformer oil is used in operation and chemicals are stored in the building of the sub-station. Please clarify if additional hotspots sampling locations at the sub-station building have been	There is no chemical storage in the building of the sub-station as confirmed and observed during the site walkover. The site walkover checklist for the concerned sub-station in Appendix G was revised.



**Queen's Hill Sewage Pumping Station****Land Contamination Assessment Plan (TCS00862/17/600/R0010v2) submitted on 24 February 2017****EPD's Comments received on 31 March 2017**

<b>Item</b>	<b>EPD's comment</b>	<b>Response to comment</b>
	considered. Please also provide the proposed grid size dimension for the sub-station for clarity	Proposed grid size dimension for the sub-station was provided in the Section 3.2 and shown in Appendix E.
6	Section 3.3: Similar to Comment (2). It is mentioned in S.2.4 that there is no designated location or proper facilities for chemical storage at the suspected car park/workshop, please clarify why the proposed grid sampling does not cover the remaining area of the suspected car park/workshop. Please indicate grid sampling locations and hotspot sampling locations respectively in relevant text/table/appendix for clarity.	Same as our response to the Comment (2) that since part of the two concerned sites are outside the Sewage Pumping Station site, this land contamination assessment will not cover the areas outside the site boundary of Sewage Pumping Station site. Moreover, grid sampling locations and the hotspot sampling locations were indicated in Section 3.3.
7	Table 3-1: Please summarize the proposed sampling depths, termination depth and key Chemicals of Concern (COCs) to be tested in the table for clarity.	Proposed sampling depths, termination depth and key Chemicals of Concern (COCs) to be tested were incorporated into Table 3-1
8	Section 3.8: Please clarify if the proposed COCs to be tested have taken into consideration of the chemicals stored in the sub-station building.	As referred to our response to Comment (5), there is no chemical storage in the building of the sub-station as confirmed and observed during the site walkover. Thus no additional COCs needed to be considered for the sub-station.
9	Section 4: The Consultant should clarify and check the following:	
	a) Why trip blank and field blank for soil samples are not taken;	No trip blank and field blank for soil samples is taken due to no specified requirement of taking the trip blank and field blank for soil samples.
	b) why only BTEX is tested for the groundwater samples;	BTEX is tested only for trip blank and field blank for groundwater since BTEX are the most common chemicals present in the ambient air in contaminated sites.
	c) Table 4-1 and S4.7 are not consistent.	Number of equipment blank for ground water sampling was revised in Section 4.7.
10	Section 3.8: Please clarify if the proposed COCs to be tested have taken into consideration of the chemicals stored in the sub-station building.	Same response for the comment (8).

**Queen's Hill Sewage Pumping Station  
Land Contamination Assessment Plan (TCS00862/17/600/R0010v3) submitted on 6 April 2017  
EPD's Comments received on 19 April 2017**

<b>Item</b>	<b>EPD's comment</b>	<b>Response to comment</b>
1	Section 2.2: Please double-check whether the site inspection was conducted in 2017 or 2016 to tally with relevant section(s) and appendices (e.g. S.2.5, S.3.2-3.3 and Appendix G).	The date of site inspection was revised in S2.2.
2	Section 2.5 – 2.6: a) The requested information from EPD and FSD in Appendix I are only updated to May/June 2015. Please clarify and confirm that no new potential sources (e.g. DG storage, spillage/leakage of chemicals and chemical waste generation, etc.) in the assessment sites during the intervening period. b) Please provide the consultant's exchange with the authorities (i.e. FSD, EPD) in Appendix I for clarity. Please clarify whether the findings in S.2.6 are applicable to both assessment sites.	Clarification and confirmation of no new potential sources in the assessment sites during the intervening period was presented in S.2.6. Consultant's exchange with the authorities (i.e. FSD, EPD) was provided in Appendix I. Clarification of findings of the assessment sites was provided in S.2.6.
3	Section 2.11: To investigate any presence of groundwater contamination and the potential for migration of contamination through groundwater, the Consultants are reminded to address the assessment on hydrogeology (e.g. groundwater depth and flow direction) in the assessment areas,	Reminder noted and the hydrogeology in the assessment areas will be assessed when conducting site investigation work.
4	Section 3 a) RE R-to-C item (2), please state in text the site constraints in relation to the site boundary for conducting the land contamination assessment, and the proposed arrangement for the assessment area that are not covered under this land contamination assessment. b) Please provide the site area of the suspected car park/workshop within the Project boundary in S3.3 for clarity. c) Table 3-1: Please add an additional column to clarify the rationale for the proposed sampling locations, and address the potential migration of contaminants between the Project sites (i.e. purple areas in Appendix E) and the rest of the assessment areas (i.e. orange area in Appendix E)(see also comment (3))	The site constraints in relation to the site boundary for conducting the land contamination assessment was stated in S.3.2. Site area of the suspected car park/workshop within the Project boundary was provided in S.3.3. An additional column to clarify the rationale for the proposed sampling was added in Table 3-1. Since the hydrogeology (groundwater depth and flow direction) of the assessment areas will be assessed during the site investigation, if there is any contaminant found on site the potential migration of the contaminant will be reported in the CAR.
5	Section 4: The Consultants should address the following: - Whether the "trip blank" and "field blank" are representative of the groundwater samples in only "BTEX" out of the Chemicals of Concern (COCs) are tested. - How the QA/QC for handling of soil sample is ensured. - The QA/QC sampling frequency as mentioned in S. 4.1, S.4.4 and Table 4-1 are inconsistent.	Full list of Volatile Organic Compounds (VOCs) listed in Table 3-2 and Table 3-3 are now proposed to be tested for "trip blank" and "field blank" of soil and groundwater samples. S.4.2, S.4.3. Table 4-1 were revised. Trip blank and field blank are now also proposed to be collected for soil sample to ensure the A/QC for handling of soil sample. S.4.1, S.4.4 and Table 4-1 were revised and the QA/QC sampling frequency mentioned are not consistent.
6	Appendix G: Please double-check the accuracy of the contents in the site walkover checklist (e.g. the "site description" for both assessment sites are "Filling Station").	The site walkover checklists were revised and double-checked.