

## ***Appendix 5.2a***

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### ***Contamination Assessment Report (CAR) for Radar Station***

**Agreement No. CE 35/2006(CE)  
Kai Tak Development Engineering Study  
cum Design and Construction of Advance Works  
– Investigation, Design and Construction**

**CONTAMINATION ASSESSMENT REPORT  
FOR RADAR STATION (REV. 1)**

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## 1 INTRODUCTION

### 1.1 Background

- 1.1.1 The former Kai Tak Airport started its operation since 1920s and was replaced by the new airport at Chek Lap Kok in 1998. The total area of the former Kai Tak Airport is about 260 hectares covering the North and South Aprons and the Runway areas extending into Kowloon Bay.
- 1.1.2 The Kai Tak Development (KTD) is a Designated Project (DP) in accordance with item 1 of schedule 3 under the Environmental Impact Assessment Ordinance (EIAO). The objectives of the Project aim to provide information on the nature and extent of environmental impacts arising from the construction and operation of the developments proposed under the Project and related works that take place concurrently.
- 1.1.3 As commissioned by the Civil Engineering and Development Department (CEDD) to undertake land contamination assessment at Radar Station next to the ex-Government Flying Service (ex-GFS) site at the end of the South Apron area of the former Kai Tak Airport (hereinafter called “the Study Area”), under *Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction of Cruise Terminal Advance Works – Investigation, Design and Construction*, a contamination assessment plan (CAP) was provided covering the Study Area of about 1,600m<sup>2</sup> with the location as shown in **Drawing 1.1**.
- 1.1.4 The CAP, which outlined the sampling locations as well as the testing schedule for site investigation (SI) in the Study Area, was approved by Environmental Protection Department (EPD). In general, the approved CAP proposed that a total of 4 boreholes within the Study Area are to be drilled for soil and groundwater sampling and testing within the Study Area.
- 1.1.5 The SI works for land contamination assessment in the Study Area were commenced on 14 September 2007 and completed on 9 November 2007. The SI works, including rotary drilling of boreholes, logging of ground materials, installation of groundwater monitoring wells, water level monitoring and reinstatement of excavations, were all conducted by Vibro (H.K.) Limited (Vibro) under CEDD Term Contract No.GE/2007/03 (Works Order No. GE/2007/03.61) while laboratory analyses were carried out by Lam Laboratories Limited (LAM) under CEDD term Contract No.GE/2005/49 (Works Order No. GE/2005/49.28).

### 1.2 Objectives

- 1.2.1 The objectives of this Contamination Assessment Report (CAR) are to summarize findings of the SI (including fieldworks and laboratory analyses) and to determine the nature and extent of contamination based on the findings. Once contamination is confirmed, remediation proposal suggesting appropriate remediation actions for the contaminated area would be provided as a Remediation Action Plan (RAP), either separately or in the same report under different sections.
- 1.2.2 This CAR is submitted to seek endorsement from the Director of Environmental Protection (DEP) in accordance with *Section 3.4.10.5 of the EIA Study Brief for Kai Tak Development (ESB-152/2006)*.



## 2 FINDINGS OF CONTAMINATION ASSESSMENT PLAN

- 2.1.1 According to the approved CAP, underground fuel tank, standby generator room, fuel tank room and transformer room were suspected to have potential contamination. During the site inspection, stains were observed at the fuel tank room around the daily tank, and at the standby generator room around the container storage area. In light of the potential sources of land contamination identified in the Study Area and the potential migration of the contaminants generated by the site activities, a total of 8 locations were identified as the potential contamination hotspots.
- 2.1.2 The criteria for identification of contamination hotspots were based upon the site observation of stain/ground discolourization, machine/ chemical storage locations or areas with contamination activities undertaken. Detailed rationales for selecting sampling locations in the CAP are provided in **Appendix A**.
- 2.1.3 Since the standby generator room, fuel tank room and transformer room were still in operation during the SI, SI works at 4 of the 8 hotspot locations, which are located inside the building of the Radar Station (fuel tank room, standby generator room and transformer room), were not possible to carry out due to site accessibility and safety issues. Therefore only 4 boreholes were deemed possible for SI at the outdoor area as in the approved CAP.
- 2.1.4 For the 4 hotspots which are located inside the building of the Radar Station, it was recommended that a land contamination assessment should be carried out upon the cessation of the operations and prior to the redevelopment. A supplementary sampling plan providing the sampling and laboratory analysis information for the SI in these areas are attached in **Appendix B**.

### **3 CONTAMINATION ASSESSMENT REPORT**

#### **3.1 Assessment Methodology**

##### ***Soil Boring and Sampling***

- 3.1.1 The SI works at Radar Station were carried out from 14 September 2007 to 9 November 2007. During the SI, sampling at RSB-01 was not feasible to complete according to the approved CAP.
- 3.1.2 Soil boring at RSB-01 was only proceeded down to 3.8m below base of existing concrete pavement (BBC) due to the presence of intact concrete material, which was suspected to be the foundation structure of the building. An additional borehole (RSB-01A) adjacent to RSB-01 was therefore constructed to the desired depth to define the nature and extent of potential land contamination in the vicinity of the existing underground fuel tank.
- 3.1.3 A total of 5 boreholes (RSB-01, RSB-01A, RSB-02, RSB-07 and RSB-08) were constructed within the Study Area, locations are illustrated in **Drawing 3.1**.
- 3.1.4 Soil samples were collected at about 1m, 2.5m and 3.5m BBC only at RSB-01 while soil samples were collected at about 1m, 2.5m, 3.5m, 5m and 6m BBC at RSB-01A and RSB-02; and at about 1m, 2.5m and 3.5m BBC at RSB-07 and RSB-08. However, it should be noted that, for the presence of gravel, cobble and/or boulder in the fill materials encountered in RSB-02 and RSB-07, some of the soil samples could not be collected exactly at but close to the desired depths.
- 3.1.5 Before drilling, the sampler and all equipment in contact with the ground were thoroughly decontaminated prior to use at each borehole by laboratory-grade detergent and steam-cleaning/ high-pressure hot water jet.
- 3.1.6 Soil samples were properly labeled and stored in cool boxes at around 4°C until delivered to the analytical laboratory. All the collected soil samples in the SI were analyzed in accordance with the analysis schedules detailed in the approved CAP.

##### ***Strata Logging***

- 3.1.7 Strata logging for boreholes was undertaken during the course of drilling and sampling by a qualified geologists. The logs included the general stratigraphic descriptions, depth of soil sampling, sample notation and level of groundwater (if encountered). The presence of rocks/boulders/cobbles and foreign materials such as metals, wood and plastics was also recorded.

##### ***Groundwater Sampling***

- 3.1.8 After completion of soil sampling, groundwater monitoring wells were installed at all 5 boreholes with groundwater encountered. After installation, well development (approximately 5 well volumes) was carried out to remove silt and drilling fluid, if any, reside from the wells. Groundwater level and thickness of free product layer, if present, were measured at each well before groundwater samples were taken.
- 3.1.9 Prior to groundwater sampling, monitoring wells were purged (at least 3 well volumes) to remove fine-grained materials and to collect freshly refilled representative groundwater samples.
- 3.1.10 Immediate after collection, groundwater samples were transferred to new, clean, laboratory-prepared, “darken” type sample containers. Groundwater samples were placed in the glass jars with zero headspace and promptly sealed with a septum-lined cap. All samples were clearly labeled. Immediately following collection, samples were subsequently stored in cool box at about 4 °C and delivery to analytical laboratory on the same day.

3.1.11 All groundwater samples were analyzed in accordance with the analysis schedules detailed in the approved CAP (**Appendix A**).

### 3.2 Assessment Criteria

#### **Criteria for Soil and Groundwater Contamination**

3.2.1 The assessment methodology of this Study was developed in accordance with the Practice Note ProPECC PN3/94 “*Contaminated Land Assessment and Remediation*” and “*Guidance Notes for Investigation and Remediation of Contaminated Sites of Petrol Filling Stations, Boatyards, and Car Repair/Dismantling Workshops*” issued by the EPD, as outlined in the approved CAP.

3.2.2 The Practice Note was used in setting the soil contamination criteria. The Practice Note makes reference to criteria developed in the Netherlands (Dutch ‘ABC’ Levels), which are most comprehensive and widely used for contaminated site assessment. The preliminary screening approach adopted in this study was based on the Dutch criteria which consist of 3 levels of guidelines, namely A, B, and C. The simplified explanation of the ABC levels is as follows:

- ‘A’ level implies unpolluted;
- ‘B’ level implies potential pollution present that requires further investigation or remediation; and
- ‘C’ level implies pollution which requires remediation.

3.2.3 The Dutch Criteria are very stringent as they are developed based on a “good for all uses” philosophy. The EPD generally requires remediation for soil contamination above the Dutch B level. In other words, the Dutch B level is the cleanup target for remediation of soil. Relevant soil and groundwater Dutch ‘ABC’ levels for this Study are presented in **Table 3.1**.

**Table 3.1 Dutch ABC Values for Soil and Groundwater Contamination**

Parameter	Soil (mg/kg)			Groundwater(µg/L)		
	Dutch A	Dutch B	Dutch C	Dutch A	Dutch B	Dutch C
<b>Total Petroleum Hydrocarbons (TPH) (as mineral oil)</b>	100	1000	5000	20	200	600
<b>BTEX</b>						
Benzene	0.01	0.5	5	0.2	1	5
Toluene	0.05	3	30	0.5	15	50
Ethylbenzene	0.05	5	50	0.5	20	60
Xylenes	0.05	5	50	0.5	20	60
<b>Polyaromatic Hydrocarbons (PAHs)</b>						
Naphthalene	0.1	5	50	0.2	7	30
Phenanthrene	0.1	10	100	0.1	2	10
Anthracene	0.1	10	100	0.1	2	10
Fluoranthene	0.1	10	100	0.02	1	5
Benzo(a)pyrene	0.05	1	10	0.01	0.2	1
Pyrene	0.1	10	100	0.02	1	5
<b>Phenols</b>	0.02	1	10	0.5	15	50
<b>Chlorinated Hydrocarbons-Aliphatics (for individual)</b>	0.1	5	50	1	10	50

Parameter	Soil (mg/kg)			Groundwater(µg/L)		
	Dutch A	Dutch B	Dutch C	Dutch A	Dutch B	Dutch C
<b>Metals</b>						
Cadmium (Cd)	1	5	20	1	2.5	10
Lead (Pb)	50	150	600	20	50	200
Copper (Cu)	50	100	500	20	50	200
Tin (Sn)	20	50	300	10	30	150
Chromium (Cr)	100	250	800	20	50	200
Nickel (Ni)	50	100	500	20	50	200
Zinc (Zn)	200	500	3000	50	200	800
Cobalt (Co)	20	50	300	20	50	200
Arsenic (As)	20	30	50	10	30	100
Molybdenum (Mo)	10	40	200	5	20	100
Barium (Ba)	200	400	2000	50	100	500
Mercury (Hg)	0.5	2	10	0.2	0.5	2

### ***Risk-based Criteria for Groundwater***

- 3.2.4 The Dutch 'ABC' criteria were established based on the assumption that groundwater is used as potable water. However, it is too stringent to be applied directly to Hong Kong where groundwater is not generally for potable use. Hence, the Dutch B levels would be only for screening out the chemicals-of-concern (COCs) for risk assessment and are not for assessing groundwater contamination in Hong Kong. A risk-based assessment would be carried out for contaminants with the concentration exceeding the Dutch B level to evaluate the risks posed to the sensitive receptors.
- 3.2.5 The risk-based assessment that has been adopted in US Environmental Protection Agency (USEPA) takes into account concentrations of individual contaminants in groundwater, the anticipated most sensitive human receptor and the potential exposure pathways. For a worst-case scenario, the largest contaminant concentrations in the groundwater samples would be taken as the source concentration for the risk calculation.
- 3.2.6 Exceedance of the risk-based criteria would be qualified in two tiers. Firstly, the total Pathway Hazard Index that is the sum of contaminant hazard quotients exceeds one (i.e. USEPA recommended hazard index). Secondly the largest contaminant concentration exceeds the corresponding Risk Based Screening Level (RBSL) that is derived from the recognized oral reference dose. For carcinogens, the first is the Total Carcinogenic Risk that is the sum of contaminant carcinogenic risk exceeds  $1 \times 10^{-6}$  (i.e. USEPA lifetime cancer risk level). The second is the largest carcinogenic contaminant concentration exceeds the corresponding RBSL that is derived from the recognized carcinogenic oral slope factor. It should be noted that risk assessment could only be undertaken for those chemicals that have a recognized oral slope factor or oral reference dose.

## **3.3 Analytical Results and Interpretation**

### ***Fieldwork and On-site Measurements***

- 3.3.1 The SI was undertaken in accordance with the sampling plan detailed in the approved CAP.
- 3.3.2 No distinctive, characteristic smell of soil and groundwater sample exhibiting signs of contamination was noticeable.
- 3.3.3 Soil boring logs are presented in **Appendix C**.

#### On-site PID Measurement

- 3.3.4 The volatile organic compounds (VOCs) concentrations in the soil samples obtained were measured by a photoionization detector (PID).
- 3.3.5 In general, the VOC levels in the soil samples are low (below 5.2ppm), which is considered minimal to pose any harmful effects to site workers during decontamination.

#### Thickness of Free Product Measurement

- 3.3.6 Floating oil / free product (of TPH) were not found in all 5 boreholes.
- 3.3.7 As no free product was encountered during the SI, only the results of PID measurement are presented in **Appendix D**.

### **Laboratory Analytical Results**

#### Results of Soil Analysis

- 3.3.8 A total of 19 soil samples, excluding those for QA/QC purposes, were collected during the SI for laboratory analysis. The laboratory testing results for all soil samples are presented in **Appendix E**.
- 3.3.9 Among these samples collected, no exceedances to the Dutch B levels were recorded and as such, soil remediation is considered not necessary.

#### Results of Groundwater Analysis

- 3.3.10 During the SI, groundwater was encountered in all boreholes. A total of 5 groundwater samples were therefore collected from these boreholes. **Table 3.2** shows the termination depth of each borehole and the corresponding groundwater level. The measured groundwater level contour is presented in **Drawing 3.2**.

**Table 3.2 Summary of the Borehole Termination Depths and Groundwater Level**

Sample I.D.	Groundwater Level		Termination Depth of Borehole
	m Below Ground	mPD	m Below Ground
RSB-01	2.24	2.21	4.50
RSB-01A	2.20	2.25	6.70
RSB-02	2.18	2.25	7.00
RSB-07	2.24	2.22	6.15
RSB-08	2.28	2.2	6.45

- 3.3.11 The groundwater samples with concentration exceeding the Dutch B/C levels are summarized in **Table 3.3**. The laboratory testing results for all groundwater samples are also provided in **Appendix E**.

**Table 3.3 Summary of Groundwater Samples Exceeding the Dutch B/C Values**

Sample I.D.	GW depth (m below ground)	Contaminant	Dutch Level		Concentration (µg/L)	Dutch Level Exceeded
			B	C		
RSB-01	2.24	Cadmium	2.5	10	3.2	>B
		Copper	50	200	76	>B
		Lead	50	200	1600	>C
		Zinc	200	800	700	>B
		Barium	100	500	390	>B
		TPH	200	600	2871	>C

Sample I.D.	GW depth (m below ground)	Contaminant	Dutch Level		Concentration (µg/L)	Dutch Level Exceeded
			B	C		
RSB-01A	2.20	Cadmium	2.5	10	3.8	>B
		Copper	50	200	92	>B
		Lead	50	200	1300	>C
		Zinc	200	800	670	>B
		Barium	100	500	250	>B
RSB-02	2.18	TPH	200	600	259	>B
		Lead	50	200	410	>C
		Zinc	200	800	310	>B
		Barium	100	500	170	>B
RSB-07	2.24	TPH	200	600	435	>B
		Lead	50	200	210	>C
RSB-08	2.28	Barium	100	500	210	>B
		Lead	50	200	450	>C
		Zinc	200	800	510	>B
		Barium	100	500	640	>C
		TPH	200	600	250	>B
		Phenanthrene	2	10	2.3	>B

- 3.3.12 As discussed earlier, the Dutch values for groundwater would serve to indicate the chemical-of-concerns (COCs) for risk assessment. A risk-based assessment was thus carried out for parameters which exceeded the Dutch B/C levels to evaluate the risks posed to the sensitive receptors, particularly construction workers, who have direct contact with groundwater.
- 3.3.13 The maximum contaminant concentration recorded in the groundwater samples irrespective of their locations would be taken as the source concentration for the risk calculation. Details of groundwater risk assessment are given in **Appendix F**.
- 3.3.14 The results of the groundwater risk assessment indicate that concentrations of the COCs in the groundwater, including metals (cadmium, copper, lead, zinc, molybdenum and barium), TPH and phenanthrene do not exceed the risk-based criteria for remediation.
- 3.3.15 For the case of TPH, the “allowable” concentration for TPH derived from the risk assessment (2.13E+02 mg/L) is above the solubility limit of TPH in water, the remediation criterion for TPH should therefore be interpreted as “no free product” present in groundwater. In accordance with the on-site measurement records, no apparent floating free products were observed in all groundwater samples. Thus, no remediation is considered necessary with reference to the remediation criterion.
- 3.3.16 In case dewatering is necessary during excavation for decommissioning or further development, the groundwater extracted at the excavated area could be recharged on-site within the 10m-zone around from the boundary of the excavated area. The water should be recharged in continuous mode.

#### Results of QA/QC Analysis

- 3.3.17 QA/QC is the practice of making sure that collection and analysis techniques provide precise and accurate information. This process is to ensure the levels of contamination measured in the environmental samples reflect the actual environmental levels and are not due to accidental contamination of the sample or sample container. In this Study, 1 duplicate soil sample and 1 set of field blank and equipment blank were collected and analyzed during the course of sampling. The laboratory results for QA/QC samples are presented in **Appendix E**.
- 3.3.18 The laboratory results showed that detectable heavy metals (copper and tin) and TPH (C15-C28, C29-C36) were found in the field and/or equipment blanks. The potential source of

contamination in the blanks could be due to (1) sampling or laboratory testing equipments not being decontaminated completely; (2) cross-contamination from the ambient conditions during sampling and laboratory testing; and 3) contaminated from the blank container itself. As reported by the site supervision personnel and the laboratory, all procedures were implemented in accordance to the requirement set in the approved CAP during sampling at the site and analysis in the laboratory. Though, there is possible cross-contamination which would cause higher reported values than actual, given that the chemical-of-concerns do not exceed the risk-based criteria for remediation, the results would not influence the outcome of this assessment.

- 3.3.19 In order to assess the sampling and laboratory reproducibility and precision, the relative percent difference (RPD) of the duplicate samples were determined. The USEPA acceptable limit for RPD is less than 50% for soil. The calculation, as presented in **Appendix E**, showed that most of the RPDs for soil samples were below 50% which implies for quality acceptance. Although some of the RPDs were found elevated for more than 50%, no discrepancies were observed during sampling in the site and analysis in the laboratory. In addition, since no Dutch B exceedance was found in the samples and remediation is not necessary, the results of RPD would not influence the outcome of this assessment.

### **3.4 Estimation of Soil Contamination Extent and Remediation**

- 3.4.1 Based on the analytical results of soil presented above, it is revealed that no testing parameters for the soil samples showed exceedance in the relevant Dutch B levels and soil remediation is considered not necessary.

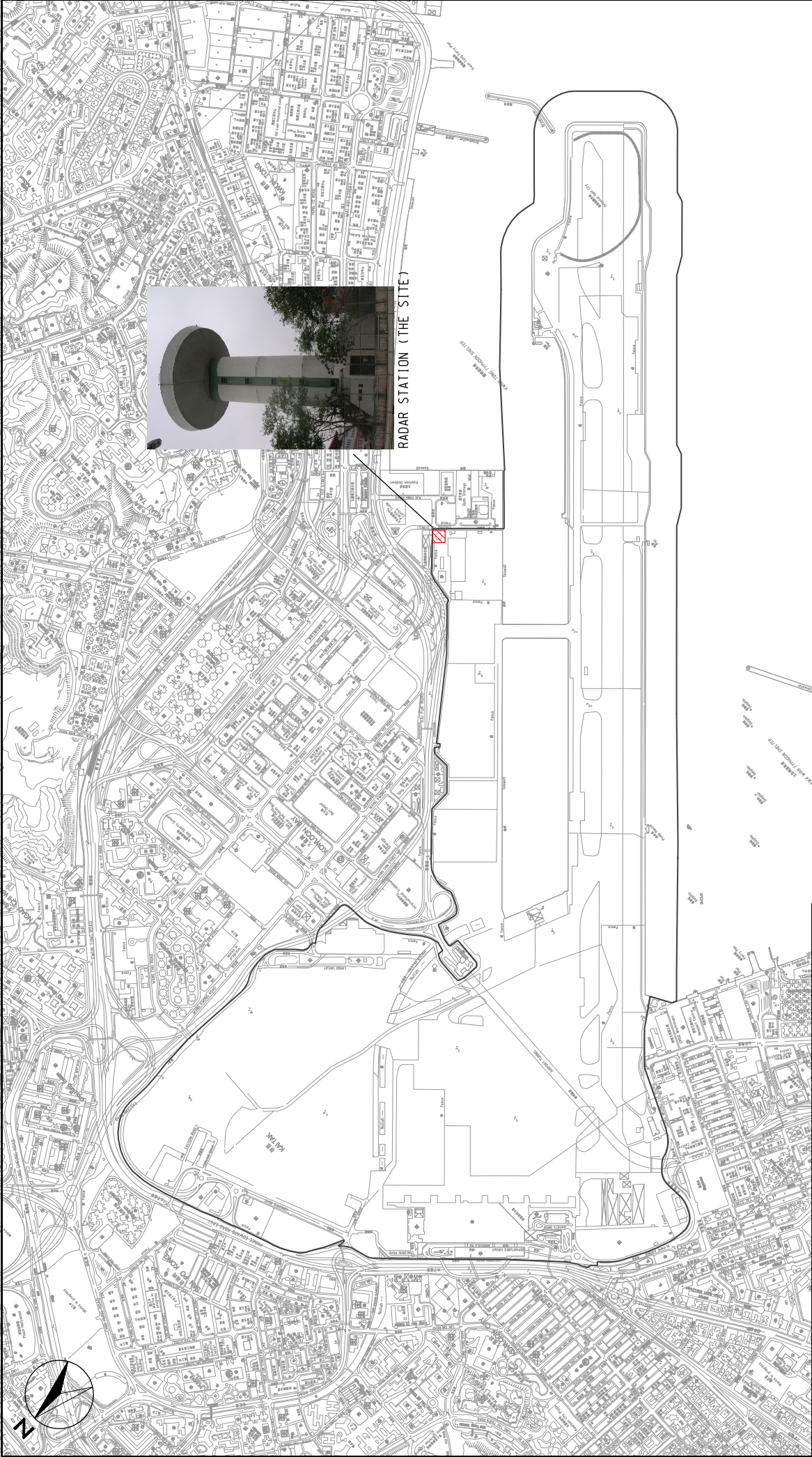
### **3.5 Conclusions and Recommendations**

- 3.5.1 Sampling at 1 of the borehole locations (RSB-01) was not completed to the desired depth due to the presence of concrete material. A completed set of soil samples was attained after borehole relocation (RSB-01A). A total of 5 boreholes were constructed during the SI.
- 3.5.2 According to the results of site investigation, a total of 19 soil samples were collected at RSB-01, RSB-01A, RSB-02, RSB-07 and RSB-08. No exceedances in Dutch B/C levels were found among all soil samples collected.
- 3.5.3 The results of the groundwater risk assessment indicate that concentration of the chemical-of-concerns (COCs) in the groundwater, including heavy metals (cadmium, copper, lead, zinc, molybdenum and barium), TPH, and phenanthrene do not exceed the risk-based criteria for remediation. As no apparent floating free products were recorded in all groundwater samples, it is considered that no remediation is required.
- 3.5.4 Hence, no remediation action is considered necessary for the outdoor area of Radar Station.
- 3.5.5 Land contamination assessment for the area inside the building of the Radar Station, covering the fuel tank room, the transformer room and the standby generator room, should be carried out upon the cessation of operations and prior to the redevelopment of the Study Area. Based on the results of SI works conducted at the outdoor area of the Radar Station, there has been no exceedances in Dutch B/C levels among all soil samples collected. Hence, the contamination, if any, within the building of Radar Station is considered localized and would not significantly impact the surrounding areas.

***Drawings***

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LEGEND



STUDY AREA

PLAN OF HONG KONG INTERNATIONAL AIRPORT  
(PLAN NO. KM 19659 DATED 1-11-1994)

(LANDS DEPT. LETTER REF: (20) IN LND KEPD/103/13(11))

**MAUNSELL** AECOM

Maunsell Consultants Asia Ltd

AGREEMENT NO. CE 35/2006 (CE)  
KAI TAK DEVELOPMENT ENGINEERING STUDY CUM DESIGN AND  
CONSTRUCTION OF ADVANCE WORKS-INVESTIGATION, DESIGN AND CONSTRUCTION

SITE LOCATION PLAN

SCALE	A3 1:12000	DATE	JAN 08
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JOB No.	60022503	DRAWING No.	1.1
REV			—

- ① UNDERGROUND FUEL TANK
- ② STANDBY GENERATOR ROOM
- ③ FUEL TANK ROOM
- ④ CO2 ROOM
- ⑤ PUMP ROOM
- ⑥ TRANSFORMER ROOM
- ⑦ SWITCH ROOM
- ⑧ LOBBY



AS-BUILT BOREHOLE LOCATION

ASSESSMENT AREA OF RADAR STATION

UNDERGROUND FUEL TANK

<div><div><div>MAUNSELL</div><div>AECOM</div></div><div>Maunsell Consultants Asia Ltd</div></div>	AGREEMENT NO. CE 35/2006 (CE) KAI TAK DEVELOPMENT ENGINEERING STUDY CUM DESIGN AND CONSTRUCTION OF ADVANCE WORKS-INVESTIGATION, DESIGN AND CONSTRUCTION  AS-BUILT SAMPLING LOCATIONS				
	SCALE	1:400	DATE	JAN 08	
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- ① UNDERGROUND FUEL TANK
- ② STANDBY GENERATOR ROOM
- ③ FUEL TANK ROOM
- ④ CO2 ROOM
- ⑤ PUMP ROOM
- ⑥ TRANSFORMER ROOM
- ⑦ SWITCH ROOM
- ⑧ LOBBY



AS-BUILT BOREHOLE LOCATION

CONTOURS OF MEASURED  
GROUNDWATER LEVEL

ASSESSMENT AREA OF RADAR STATION

UNDERGROUND FUEL TANK

<div><div><div>MAUNSELL</div><div>AECOM</div></div><div>Maunsell Consultants Asia Ltd</div></div>		AGREEMENT NO. CE 35/2006 (CE) KAI TAK DEVELOPMENT ENGINEERING STUDY CUM DESIGN AND CONSTRUCTION OF ADVANCE WORKS-INVESTIGATION, DESIGN AND CONSTRUCTION CONTOURS OF MEASURED GROUNDWATER LEVELS			
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## ***Appendices***

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***Appendix A***  
***(Sampling and Testing Schedule***  
***Proposed in the CAP)***

**Table 4.1 Sampling and Testing Plan for the Study Area**  
(Concerned Site Area: ~1,600m<sup>2</sup>; Proposed 4 Sampling Locations)

Proposed Sampling Location	Sampling Method	Sample Matrix	Parameters to be Tested					Rationale of Sampling	
			TPH	BTEX	PAHs	Phenols	Chlorinated Hydrocarbons		Heavy Metals
B-01	Borehole to 6m	Soil	X	X	X	X	X	X	To assess any contamination due to underground fuel tank. The sampling point would be in vicinity of the underground fuel tanks.
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Groundwater	X	X	X	X	X	X	
B-02	Borehole to 6m	Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		Groundwater	X	X	X	X	X	X	

Proposed Sampling Location	Sampling Method	Sample Matrix		Parameters to be Tested						Rationale of Sampling
				TPH	BTEX	PAHs	Phenols	Chlorinated Hydrocarbons	Heavy Metals	
B-07	Borehole to 6m	Soil		X	X	X	X	X	X	To assess any potential migration of contaminants from the activities undertaken in the Radar Station.
		Soil		X	X	X	X	X	X	
		Soil		X	X	X	X	X	X	
		Groundwater	If present	X	X	X	X	X	X	
B-08	Borehole to 6m	Soil		X	X	X	X	X	X	
		Soil		X	X	X	X	X	X	
		Soil		X	X	X	X	X	X	
		Groundwater	If present	X	X	X	X	X	X	

Remarks:

BBC = Below Base of Existing Concrete Pavement; GW=groundwater; X = testing proposed

\* The proposed sampling locations are located inside the building. If there are any spatial and headroom constraints for the proposed sampling locations, trial pit(s) should be considered as an alternative to collect soil samples. The maximum depth of trial pits should be at least 2m -3m BBC subject to site conditions.

***Appendix B***  

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***(Supplementary Sampling Plan for  
the Remaining Areas in Radar Station)***



**Agreement No. CE 35/2006(CE)  
Kai Tak Development Engineering Study  
cum Design and Construction of Advance Works  
– Investigation, Design and Construction**

**SUPPLEMENTARY SAMPLING PLAN FOR RADAR STATION**

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Table 2.4	Dutch ABC Values for Soil and Groundwater Contamination

**List of Drawings**

Drawing A2.1	Proposed Supplementary SI Locations at Potential Contaminated Hotspots
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## **1 INTRODUCTION**

### **1.1 Background**

- 1.1.1 The site investigation (SI) works for land contamination assessment in the Study Area were commenced on 14 September 2007 and completed on 9 November 2007. Most of the proposed boreholes (4 nos) located at the outdoor area were constructed and completed for the purpose of identifying possible land contamination at the hotspot areas. 4 potential contamination hotspots within the buildings (fuel tank room, standby generator room and the transformer room) were still in operation at the time of the SI and could not be completed. Therefore, it is recommended that a land contamination investigation should be carried out upon the cessation of the operations and prior to the redevelopment. This supplementary sampling plan (This Plan) is therefore provided for the additional investigation, if necessary, to supplement the approved CAP.
- 1.1.2 This Plan is to supplement the approved CAP by providing the sampling and laboratory analysis information for the areas within the buildings of the Radar Station. Assessment of land contamination sources shall be conducted in accordance with the environmental standards and non-statutory guidelines recommended in the approved CAP.
- 1.1.3 In general, the sampling methods for soil and groundwater (if any), requirements of strata logging and procedures for free product and groundwater level measurement, decontamination, sample collection and delivery shall be conducted as delineated in the approved CAP. The general health and safety measures suggested in the approved CAP shall also be taken as described.

## 2 SAMPLING PLAN FOR SITE INVESTIGATION

### 2.1 Sampling Locations

2.1.1 Potential sources of land contamination within the building area of the Radar Station were studied in the approved CAP based on information obtained from the desktop studies, site inspections, interviews and site observations.

2.1.2 Contamination hotspots were identified in the approved CAP by investigation of the potential sources of land contamination. Identified hotspots are summarized in the following table.

**Table 2.1 Identified Contamination Hotspots**

Uses	Site Observation	Potential Source of Contaminants	Remarks
Standby Generator Room	<u>Container storage area:</u> <ul style="list-style-type: none"> <li>Several plastic containers observed</li> <li>No containment or drip trays were placed underneath the containers.</li> <li>Stains of paint have been found on the ground</li> </ul>	<ul style="list-style-type: none"> <li>Localized spillage of oils/paints</li> </ul>	<ul style="list-style-type: none"> <li>1 borehole /trial pit is proposed in this area</li> </ul>
	<u>Electricity generator</u> <ul style="list-style-type: none"> <li>Drip trays found under the generator to collect fuel leakage</li> <li>The generator was installed on a concrete block</li> </ul>	<ul style="list-style-type: none"> <li>Mishandling / Localized spillages of lubricating oils, hydraulic fluid, engine coolants, diesel fuel from maintenance and dismantling of equipment</li> </ul>	<ul style="list-style-type: none"> <li>1 borehole /trial pit is proposed in this area</li> </ul>
Fuel Tank Room	<ul style="list-style-type: none"> <li>Diesel daily tank found with containment placed underneath.</li> <li>Stains were observed on the concrete paved ground around the tank.</li> </ul>	<ul style="list-style-type: none"> <li>Spillage of diesel fuel during refueling/ fueling process</li> </ul>	<ul style="list-style-type: none"> <li>1 borehole /trial pit is proposed in this area</li> </ul>
Transformer room	<ul style="list-style-type: none"> <li>Operated for more than 20 years.</li> <li>Materials such as engine coolants, battery fluid and electrical wiring have been used, stored or generated from the site</li> <li>Regular substation inspection and cleaning were practices in this area</li> <li>Ground well paved with concrete and no apparent stains have been observed at the site.</li> </ul>	<ul style="list-style-type: none"> <li>Spillage from improper handling of Polychlorinated Biphenyls (PCBs) / transformer fluids</li> </ul>	<ul style="list-style-type: none"> <li>1 borehole /trial pit is proposed in this area</li> </ul>

2.1.3 As summarized in the above table, a total of 4 sampling drillholes are proposed for the identified hotspots inside the building of Radar Station. The indicative location plans of the proposed SI sampling locations are illustrated in **Drawing A2.1**.

- 2.1.4 It should be noted that if significant contamination was revealed during the SI, additional sampling locations would be required to determine the exact extent of contamination. The rationales for selecting the sampling locations are summarized in **Table 2.2**.

**Table 2.2 Sampling and Testing Plan**

Proposed Sampling Location	Sampling Method	Sample Matrix	Parameters to be Tested						Rationale of Sampling
			TPH	BTEX	PAHs	Phenols	Chlorinated Hydrocarbons	Heavy Metals	
RSB-03	Borehole/ Trial Pit*	Soil	X	X	X	X	X	X	To assess any contamination due to spillage/leakage from oil containers
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		GW	X	X	X	X	X	X	
RSB-04	Borehole/ Trial Pit*	Soil	X	X	X	X	X	X	To assess any contamination due to spillage/leakage during the operation of electricity generator inside engine room
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		GW	X	X	X	X	X	X	
RSB-05	Borehole/ Trial Pit*	Soil	X	X	X	X	X	X	To assess any contamination due to spillage/leakage from the daily tank, inside the storage room
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		GW	X	X	X	X	X	X	
RSB-06	Borehole/ Trial Pit*	Soil	X	X	X	X	X	X	To assess any contamination due to transformer's fluid
		Soil	X	X	X	X	X	X	
		Soil	X	X	X	X	X	X	
		GW	X	X	X	X	X	X	

Remarks:

BBC = Below Base of Existing Concrete Pavement; GW=groundwater; X = testing proposed

\* The proposed sampling locations are located inside the building. If there are any spatial and headroom constraints for the proposed sampling locations, trial pit(s) should be considered as an alternative to collect soil samples. The maximum depth of trial pits should be at least 2m -3m BBC subject to site conditions. Details of the chemical parameters shall be referred to Table 4.2 of the approved CAP and **Table 2.3** below. This table shall be read in conjunction with **Drawing A2.1**.

## 2.2 QA/QC Procedures

2.2.1 QA/QC samples shall be collected in the following frequency during the SI. Chain of Custody protocol shall be adopted.

- 1 equipment blank per 20 samples for full suite analysis
- 1 field blank per 20 samples for full suite analysis
- 1 duplicated (for soil and groundwater) per 20 samples for full suite of analysis.

2.2.2 According to the supplementary sampling plan detailed in **Table 2.2**, the total sample number would be less than 20. The minimum number of QA/QC samples which meet the frequency stated in Section 2.2.1 will be expected as follow:

- 1 equipment blank and field blank for the analysis of TPH, BTEX, PAHs, Phenols, Chlorinated hydrocarbons, heavy metal and PCB
- 1 duplicate for the analysis of TPH, BTEX, PAHs, Phenols, Chlorinated hydrocarbons, heavy metal and PCB

## 2.3 Laboratory Analysis and Results Interpretation

### Laboratory Analysis

2.3.1 Laboratory analysis covering total petroleum hydrocarbons, BTEX, PAHs, phenols, chlorinated hydrocarbons, PCBs and heavy metals, is proposed in order to screen the presence of potential contaminants that are of concern within the building area of the Radar Station. The laboratory analysis of the samples shall follow the same requirements set out in the approved CAP.

2.3.2 **Table 2.3** lists out the parameter which was not included in the approved CAP together with its detection limit and reference method for the laboratory analyses of soil and groundwater samples.

**Table 2.3 Parameters, Detection Limits and Reference Methods for Laboratory Analyses**

Item	Parameter	Soil		Groundwater	
		Detection Limit (mg/kg) or otherwise stated	Reference Method	Detection Limit (µg/L) or otherwise stated	Reference Method
1	Total Polychlorinated Biphenyls (Total PCBs)	0.1	USEPA 8070	0.2	USEPA 8070

### Results Interpretation

2.3.3 The results of the laboratory analyses shall be interpreted in accordance with the guidance documents recommended in the approved CAP.

2.3.4 Relevant criteria for soil and groundwater contamination assessment for this study have been documented in the approved CAP. For the parameter which was not included in the previous testing, the criteria for contamination assessment are specified in the following table:

**Table 2.4 Dutch ABC Values for Soil and Groundwater Contamination**

Parameter	Soil (mg/kg)			Groundwater(µg/L)		
	Dutch A	Dutch B	Dutch C	Dutch A	Dutch B	Dutch C
<b>Total Polychlorinated Biphenyls (Total PCBs)</b>	0.05	1	10	0.01	0.2	1





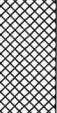
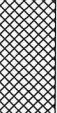
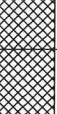
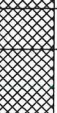
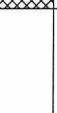


























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***Appendix C***  
***(Site Boring Log)***

<div>VIBRO</div>						DRILLHOLE RECORD							HOLE NO. RSB-01																																																																																																											
						CONTRACT NO. GE/2007/03							SHEET 1 OF 1																																																																																																											
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MACHINE & NO. VBM38								E 839759.56 N 819651.89					DATE : 21/09/2007 to 25/09/2007																																																																																																											
FLUSHING MEDIUM NA								ORIENTATION Vertical					GROUND LEVEL + 4.45 mPD																																																																																																											
<table><thead><tr><th rowspan="2">Drilling Progress</th><th rowspan="2">Casing Depth/Size</th><th rowspan="2">Water Level (m) Shift start / end</th><th rowspan="2">Water Returns %</th><th rowspan="2">TCR %</th><th rowspan="2">SCR %</th><th rowspan="2">RQD %</th><th rowspan="2">FI</th><th rowspan="2">Tests</th><th>Samples</th><th rowspan="2">Reduced Level</th><th rowspan="2">Depth (m)</th><th rowspan="2">Legend</th><th rowspan="2">Grade</th><th rowspan="2">Description</th></tr><tr><th>No. Type Depth</th></tr></thead><tbody><tr><td>21/09/2007</td><td>HW</td><td></td><td></td><td>100</td><td></td><td></td><td></td><td></td><td></td><td>+4.45</td><td>0.00</td><td></td><td></td><td>Concrete surface.</td></tr><tr><td rowspan="4">21/09/2007 25/09/2007</td><td rowspan="4"></td><td rowspan="4">Dry at 18:00 Dry at 08:00</td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4">12 bls</td><td>A</td><td>+4.30</td><td>0.15</td><td rowspan="4"></td><td rowspan="4"></td><td>Brown (7.5YR 5/4), slightly silty fine to coarse SAND with some angular to subangular fine to coarse gravel sized moderately decomposed rock fragments. (FILL)</td></tr><tr><td>B</td><td>1.00</td></tr><tr><td>C</td><td>1.15</td></tr><tr><td>En</td><td>1.50</td></tr><tr><td rowspan="4">25/09/2007</td><td rowspan="4">HW 4.00</td><td rowspan="4">2.40m at 13:00</td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4"></td><td rowspan="4">11 bls</td><td>6</td><td>2.24</td><td rowspan="4"></td><td rowspan="4"></td><td>Soft to firm, light brown (7.5YR 6/4), dappled greyish brown, clayey sandy SILT with some angular to subangular fine gravel sized highly decomposed and moderately decomposed rock fragments, occasional brick fragments and wood fragments. (FILL)</td></tr><tr><td>2</td><td>2.50</td></tr><tr><td>3</td><td>2.95 3.00</td></tr><tr><td>4</td><td>3.50</td></tr><tr><td rowspan="3">25/09/2007</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td><td>5</td><td>3.95 4.00</td><td rowspan="3"></td><td rowspan="3"></td><td>Light brown (7.5YR 6/4), silty / clayey fine to coarse SAND with some angular to subangular fine gravel sized moderately decomposed rock fragments and occasional subangular cobbles (MDG). (FILL) Grey (N 5), angular BOULDERS (Concrete). (FILL)</td></tr><tr><td>T2/OI</td><td>4.50</td></tr><tr><td></td><td>-0.05</td><td>4.50</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>End of Investigation Hole at 4.50m.</td></tr></tbody></table>															Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Water Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description	No. Type Depth	21/09/2007	HW			100						+4.45	0.00			Concrete surface.	21/09/2007 25/09/2007		Dry at 18:00 Dry at 08:00						12 bls	A	+4.30	0.15			Brown (7.5YR 5/4), slightly silty fine to coarse SAND with some angular to subangular fine to coarse gravel sized moderately decomposed rock fragments. (FILL)	B	1.00	C	1.15	En	1.50	25/09/2007	HW 4.00	2.40m at 13:00						11 bls	6	2.24			Soft to firm, light brown (7.5YR 6/4), dappled greyish brown, clayey sandy SILT with some angular to subangular fine gravel sized highly decomposed and moderately decomposed rock fragments, occasional brick fragments and wood fragments. (FILL)	2	2.50	3	2.95 3.00	4	3.50	25/09/2007									5	3.95 4.00			Light brown (7.5YR 6/4), silty / clayey fine to coarse SAND with some angular to subangular fine gravel sized moderately decomposed rock fragments and occasional subangular cobbles (MDG). (FILL) Grey (N 5), angular BOULDERS (Concrete). (FILL)	T2/OI	4.50		-0.05	4.50															End of Investigation Hole at 4.50m.
Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Water Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description																																																																																																										
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21/09/2007	HW			100						+4.45	0.00			Concrete surface.																																																																																																										
21/09/2007 25/09/2007		Dry at 18:00 Dry at 08:00						12 bls	A	+4.30	0.15			Brown (7.5YR 5/4), slightly silty fine to coarse SAND with some angular to subangular fine to coarse gravel sized moderately decomposed rock fragments. (FILL)																																																																																																										
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25/09/2007	HW 4.00	2.40m at 13:00						11 bls	6	2.24			Soft to firm, light brown (7.5YR 6/4), dappled greyish brown, clayey sandy SILT with some angular to subangular fine gravel sized highly decomposed and moderately decomposed rock fragments, occasional brick fragments and wood fragments. (FILL)																																																																																																											
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<div><div><div>↑ Disturbed sample</div><div>▨ Piston sample</div><div>▩ Split spoon sample</div><div>■ U76 undisturbed sample</div><div>▤ U100 undisturbed sample</div><div>▧ Mazier sample</div><div>□ SPT liner sample</div><div>▲ Water sample</div><div>En Environmental Sample</div></div><div><div>↓ Standard penetration test</div><div>↕ In-situ vane shear test</div><div>⊥ Permeability test</div><div>⌋ Impression packer test</div><div>⏞ Pressuremeter test</div><div>⦶ Packer Test</div><div>📡 Acoustic or optical televIEWER survey</div><div>📐 Piezometer tip</div><div>🚰 Standpipe</div><div>🔍 Groundwater monitoring well</div><div>📏 Extensometer</div></div><div><div>LOGGED T. C. Yip</div><div>DATE 27/09/2007</div><div>CHECKED C. M. Sham</div><div>DATE 28/09/2007</div></div><div>REMARKS<div>1. An inspection pit was excavated to a depth of 1.50m. 2. Groundwater monitoring well was installed to 4.00m below ground level on 25/09/2007. 3. A groundwater sample was taken from the monitoring well on 27/09/2007. The water level in the well prior to sampling was 2.24m below ground level.</div></div></div>																																																																																																																								

		DRILLHOLE RECORD		HOLE NO. RSB-01A																		
		CONTRACT NO. GE/2007/03		SHEET 1 OF 1																		
<b>PROJECT</b> Agreement No. CE35/2006 (CE), Kai Tak Development Engineering Study cum Design and Construction of Advance Work - Investigation, Design and Construction																						
<b>METHOD</b> Rotary		<b>CO-ORDINATES</b>		<b>W.O.NO.</b> GE/2007/03.61																		
<b>MACHINE &amp; NO.</b> BM45		<b>E</b> 839755.39 <b>N</b> 819653.97		<b>DATE :</b> 28/09/2007 to 29/09/2007																		
<b>FLUSHING MEDIUM</b> NA		<b>ORIENTATION</b> Vertical		<b>GROUND LEVEL</b> + 4.45 mPD																		
Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Water Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description								
28/09/2007	HW			100						+4.45	0.00			Concrete surface.								
1 2 3 4 5 6 7 8 9 10									A B C En 1 11 2 3 4 5 6 7 8 9 10	0.00 0.15 0.50 1.00 1.15 1.50 2.20 2.50 2.95 3.00 3.50 3.95 4.00 4.50 5.00 5.45 5.50 5.70 6.00 6.45 6.50	+4.30 0.15 +2.95 +1.95 -0.05 -0.55 -1.25 -1.55 -2.25	0.15 1.50 2.50 4.50 5.00 5.70 6.00 6.70	        	Light brown (7.5YR 6/4), slightly silty fine to coarse SAND with occasional angular to subangular fine gravel sized moderately decomposed rock fragments. (FILL)  Light brown (7.5YR 6/4), silty fine to coarse SAND with some angular to subangular fine gravel sized moderately decomposed rock fragments. (FILL)  Light brown (7.5YR 6/4), silty fine to coarse SAND with occasional angular to subangular fine gravel sized highly decomposed rock fragments. (FILL)  Soft, light brown (7.5YR 6/4), dappled grey, sandy clayey SILT with occasional angular to subangular fine gravel sized moderately decomposed rock fragments. (FILL)  Greyish brown (2.5Y 5/2), silty fine to medium SAND occasional angular to subangular fine gravel sized moderately decomposed rock fragments and occasional wood pieces. (FILL)  Grey (N 5), dappled light brown, angular to subangular cobbles (MDG, SDG) with some angular coarse gravel sized slightly decomposed rock fragments. (FILL)  Greyish brown (2.5Y 5/2), subangular coarse GRAVEL sized moderately decomposed rock fragments and concrete fragments. (FILL)								
									28/09/2007	2.35m at 18:00	100						48 bls					
									29/09/2007	2.27m at 08:00	62											
									29/09/2007	HW 6.70												End of Investigation Hole at 6.70m.
									<b>LOGGED</b> T. C. Yip <b>DATE</b> 06/10/2007 <b>CHECKED</b> C. M. Sham <b>DATE</b> 08/10/2007													
									<b>REMARKS</b> 1. An inspection pit was excavated to a depth of 1.50m. 2. Groundwater monitoring well was installed to 6.70m below ground level on 29/09/2007. 3. A groundwater sample was taken from the monitoring well on 02/10/2007. The water level in the well prior to sampling was 2.20m below ground level.													



		DRILLHOLE RECORD		HOLE NO.	RSB-02									
		CONTRACT NO. GE/2007/03		SHEET	1 OF 1									
<b>PROJECT</b> Agreement No. CE35/2006 (CE), Kai Tak Development Engineering Study cum Design and Construction of Advance Work - Investigation, Design and Construction														
<b>METHOD</b> Rotary		<b>CO-ORDINATES</b>		<b>W.O.NO.</b> GE/2007/03.61										
<b>MACHINE &amp; NO.</b> BM45		<b>E 839759.19      N 819657.79</b>		<b>DATE :</b> 21/09/2007 to 24/09/2007										
<b>FLUSHING MEDIUM</b> NA		<b>ORIENTATION</b> Vertical		<b>GROUND LEVEL</b> + 4.43 mPD										
Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Water Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
21/09/2007	HW			100						+4.43	0.00			Concrete surface.
21/09/2007 22/09/2007		Dry at 18:00 Dry at 08:00							A B C 13	0.00 0.15 0.50 1.00 1.15 1.50 2.18	+4.28 0.15 +2.93 1.50			Greyish brown (2.5Y 5/2), slightly silty fine to coarse SAND with some angular to subangular fine to medium gravel sized moderately decomposed rock fragments, occasional brick fragments and asphalt fragments. (FILL)  Greyish brown (2.5Y 5/2), slightly silty fine to coarse SAND with some angular to subangular fine to coarse gravel sized moderately decomposed rock fragments. (FILL)
								11 bls	3	2.50 2.60	+1.93 +1.83	2.50 2.60		Grey (N 5), angular COBBLES (MDG). (FILL) Brown (7.5YR 5/4), silty fine to coarse SAND with occasional angular to subangular fine to coarse gravel sized rock fragments. (FILL )
								20 bls	4	3.05 3.10				
										3.40	+1.03	3.40		Grey (N 5), dappled light brown, angular BOULDERS. (FILL)
								35 bls	5	3.80 4.25 4.30	+0.73	3.70		Greyish brown (2.5Y 5/2), slightly silty fine to coarse SAND with much angular to subangular fine to medium gravel sized moderately decomposed rock fragments. (FILL)
									6	4.50				
								46 bls	7	4.95 5.00	-0.57	5.00		Grey (N 5), angular BOULDERS (SDG). (FILL)
22/09/2007 24/09/2007		2.60m at 18:00 2.35m at 08:00								5.50	-0.97	5.40		Light brown (7.5YR 6/4), angular COBBLES (MDG). (FILL)
	HW 6.00							33 bls	8 9	5.95 6.00	-1.57	6.00		Light brown (7.5YR 6/4), slightly silty / clayey SAND with some angular to subangular fine gravel sized highly decomposed and moderately decomposed rock fragments. (FILL)
								18 bls	10 11	6.45 6.50	-2.07	6.50		Light brown (7.5YR 6/4), dappled grey, silty fine to coarse SAND with much angular fine to coarse gravel sized slightly decomposed rock fragments. (FILL)
24/09/2007		2.45m at 12:00							12	6.95 7.00	-2.57	7.00		End of Investigation Hole at 7.00m.
<div> <div>  Disturbed sample   Piston sample   Split spoon sample   U76 undisturbed sample   U100 undisturbed sample   Mazier sample   SPT liner sample   Water sample   Environmental Sample           </div> <div>  Standard penetration test   In-situ vane shear test   Permeability test   Impression packer test   Pressuremeter test   Packer Test   Acoustic or optical televiwer survey   Piezometer tip   Standpipe   Groundwater monitoring well   Extensometer           </div> </div> <div> <b>LOGGED</b> T. C. Yip  <b>DATE</b> 25/09/2007  <b>CHECKED</b> C. M. Sham  <b>DATE</b> 28/09/2007         </div> <div> <b>REMARKS</b>            1. An inspection pit was excavated to a depth of 1.50m.            2. Groundwater monitoring well was installed to 7.00m below ground level on 24/09/2007.            3. A groundwater sample was taken from the monitoring well on 27/09/2007. The water level in the well prior to sampling was 2.18m below ground level.            4. A duplicate environmental soil sample was taken at 1.15m below ground level on 22/09/2007.         </div>														

		DRILLHOLE RECORD		HOLE NO. RSB-07										
		CONTRACT NO. GE/2007/03		SHEET 1 OF 1										
<b>PROJECT</b> Agreement No. CE35/2006 (CE), Kai Tak Development Engineering Study cum Design and Construction of Advance Work - Investigation, Design and Construction														
<b>METHOD</b> Rotary		<b>CO-ORDINATES</b>		<b>W.O.NO.</b> GE/2007/03.61										
<b>MACHINE &amp; NO.</b> VBM38		<b>E 839777.66      N 819640.22</b>		<b>DATE :</b> 21/09/2007 to 24/09/2007										
<b>FLUSHING MEDIUM</b> NA		<b>ORIENTATION</b> Vertical		<b>GROUND LEVEL</b> + 4.46 mPD										
Drilling Progress	Casing Depth/Size	Water Level (m) Shift start / end	Water Returns %	TCR %	SCR %	RQD %	FI	Tests	Samples No. Type Depth	Reduced Level	Depth (m)	Legend	Grade	Description
21/09/2007	HW			100						+4.46	0.00			Concrete surface.
21/09/2007 22/09/2007		Dry at 18:00 Dry at 08:00							A Inspection Pit B En C	+4.31	0.15			Greyish brown (2.5Y 5/2), dappled brown, slightly silty fine to coarse SAND with some angular to subrounded fine gravel sized highly decomposed and moderately decomposed rock fragments. (FILL)
								103 bls	9 2.24 2 2.50 3 2.75 2.80					
								21 bls	T2 (OI) 4.00	+1.01	3.45			Grey (N 5), silty / clayey angular to subangular fine to coarse GRAVEL sized moderately decomposed rock fragments and occasional angular to subrounded cobbles (MDG). (FILL)
								14 bls	4.45 4.50	+0.46	4.00			Greyish brown (2.5Y 5/2), slightly silty fine to coarse SAND with some angular to subrounded fine gravel sized moderately decomposed rock fragments. (FILL)
								17 bls	4.95 5.00					
22/09/2007 24/09/2007		2.40m at 18:00 2.40m at 08:00						14 bls	5.45 5.50	-1.04	5.50			Soft to firm, light brown (7.5YR 6/4), dappled grey, sandy clayey SILT with some angular to subangular fine to coarse gravel sized moderately decomposed rock fragments. (FILL)
24/09/2007	HW 6.15								5.95 6.00	-1.69	6.15			End of Investigation Hole at 6.15m.
<div> <div>  Disturbed sample   Piston sample   Split spoon sample   U76 undisturbed sample   U100 undisturbed sample   Mazier sample   SPT liner sample   Water sample   Environmental Sample           </div> <div>  Standard penetration test   In-situ vane shear test   Permeability test   Impression packer test   Pressuremeter test   Packer Test   Acoustic or optical televiwer survey   Piezometer tip   Standpipe   Groundwater monitoring well   Extensometer           </div> </div> <div> <b>LOGGED</b> T. C. Yip  <b>DATE</b> 25/09/2007  <b>CHECKED</b> C. M. Sham  <b>DATE</b> 28/09/2007         </div> <div> <b>REMARKS</b>            1. An inspection pit was excavated to a depth of 1.50m.            2. Groundwater monitoring well was installed to 6.15m below ground level on 24/09/2007.            3. A groundwater sample was taken from the monitoring well on 27/09/2007. The water level in the well prior to sampling was 2.24m below ground level.         </div>														





***Appendix D***  
***(On-site Measurement Results)***

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Sample ID	Sampling Date	Sampling Depth m Below Base of Existing Concrete Pavement		PID Results (ppm)
		From	To	
RSB-01	21/09/2007	1	1	0.7
	25/09/2007	2.35	2.8	0
	25/09/2007	3.35	3.8	0.2
RSB-01A	28/09/2007	1	1	0
	28/09/2007	2.35	2.8	0.2
	28/09/2007	3.35	3.8	2
	28/09/2007	4.85	5.3	5.2
	29/09/2007	5.85	6.3	2.2
RSB-02	21/09/2007	1	1	0.5
	22/09/2007	2.45	2.9	0
	22/09/2007	4.35	4.8	0
	24/09/2007	5.85	6.3	0.2
	24/09/2007	6.35	6.8	0.4
RSB-07	21/09/2007	1	1	0.2
	22/09/2007	2.35	2.65	0
	24/09/2007	5.35	5.8	3.2
RSB-08	21/09/2007	1	1	0
	21/09/2007	2.35	2.8	0
	21/09/2007	3.35	3.8	0
<b>Duplicate Sample</b>				
RSB-02	21/09/2007	1	1	0

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***Appendix E***  
***(Laboratory Results)***



### Laboratory Results of Groundwater Samples

Criteria	Metals												TPH				PAHs (Low Molecular Weight)				BTEX				Phenols		Halogenated hydrocarbons - aliphatics																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	Cadmium (Cd)				Chromium (Cr)				Copper (Cu)				Nickel (Ni)				Lead (Pb)				Zinc (Zn)				Mercury (Hg)				Arsenic (As)				Cobalt (Co)				Molybdenum (Mo)				Tin (Sn)				Barium (Ba)				C6-C9				C10-C14				C29-C36				Total TPH				Naphthalene				Phenanthrene				Anthracene				2,3-Benzopyrene (as Benzo(a)pyrene)				Fluoranthene				Xylenes				Phenol				1,1-dichloroethene				trans-1,2-dichloroethene				cis-1,2-dichloroethene				1,1,1-trichloroethane				1,1-dichloropropene				tetrachloroethene				1,2-dichloroethane				1,1,2-trichloroethane				1,2-dibromomethane				1,1,2-trichloroethane				1,1,2,2-tetrachloroethane				1,2,3-trichloropropane				1,2-dichloro-3-chloropropane				Hexachlorocyclopentadiene																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	Cd	Cr	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba	C6-C9	C10-C14	C29-C36	Total TPH	Naphthalene	Phenanthrene	Anthracene	2,3-Benzopyrene (as Benzo(a)pyrene)	Fluoranthene	Xylenes	Phenol	1,1-dichloroethene	trans-1,2-dichloroethene	cis-1,2-dichloroethene	1,1,1-trichloroethane	1,1-dichloropropene	tetrachloroethene	1,2-dichloroethane	1,1,2-trichloroethane	1,2-dibromomethane	1,1,2-trichloroethane	1,1,2,2-tetrachloroethane	1,2,3-trichloropropane	1,2-dichloro-3-chloropropane	Hexachlorocyclopentadiene																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Location		Sampling Depth (m) BGL		Groundwater Samples (m BGC)		10		20		50		100		200		300		400		500		600		700		800		900		1000		1100		1200		1300		1400		1500		1600		1700		1800		1900		2000		2100		2200		2300		2400		2500		2600		2700		2800		2900		3000		3100		3200		3300		3400		3500		3600		3700		3800		3900		4000		4100		4200		4300		4400		4500		4600		4700		4800		4900		5000		5100		5200		5300		5400		5500		5600		5700		5800		5900		6000		6100		6200		6300		6400		6500		6600		6700		6800		6900		7000		7100		7200		7300		7400		7500		7600		7700		7800		7900		8000		8100		8200		8300		8400		8500		8600		8700		8800		8900		9000		9100		9200		9300		9400		9500		9600		9700		9800		9900		10000		10100		10200		10300		10400		10500		10600		10700		10800		10900		11000		11100		11200		11300		11400		11500		11600		11700		11800		11900		12000		12100		12200		12300		12400		12500		12600		12700		12800		12900		13000		13100		13200		13300		13400		13500		13600		13700		13800		13900		14000		14100		14200		14300		14400		14500		14600		14700		14800		14900		15000		15100		15200		15300		15400		15500		15600		15700		15800		15900		16000		16100		16200		16300		16400		16500		16600		16700		16800		16900		17000		17100		17200		17300		17400		17500		17600		17700		17800		17900		18000		18100		18200		18300		18400		18500		18600		18700		18800		18900		19000		19100		19200		19300		19400		19500		19600		19700		19800		19900		20000		20100		20200		20300		20400		20500		20600		20700		20800		20900		21000		21100		21200		21300		21400		21500		21600		21700		21800		21900		22000		22100		22200		22300		22400		22500		22600		22700		22800		22900		23000		23100		23200		23300		23400		23500		23600		23700		23800		23900		24000		24100		24200		24300		24400		24500		24600		24700		24800		24900		25000		25100		25200		25300		25400		25500		25600		25700		25800		25900		26000		26100		26200		26300		26400		26500		26600		26700		26800		26900		27000		27100		27200		27300		27400		27500		27600		27700		27800		27900		28000		28100		28200		28300		28400		28500		28600		28700		28800		28900		29000		29100		29200		29300		29400		29500		29600		29700		29800		29900		30000		30100		30200		30300		30400		30500		30600		30700		30800		30900		31000		31100		31200		31300		31400		31500		31600		31700		31800		31900		32000		32100		32200		32300		32400		32500		32600		32700		32800		32900		33000		33100		33200		33300		33400		33500		33600		33700		33800		33900		34000		34100		34200		34300		34400		34500		34600		34700		34800		34900		35000		35100		35200		35300		35400		35500		35600		35700		35800		35900		36000		36100		36200		36300		36400		36500		36600		36700		36800		36900		37000		37100		37200		37300		37400		37500		37600		37700		37800		37900		38000		38100		38200		38300		38400		38500		38600		38700		38800		38900		39000		39100		39200		39300		39400		39500		39600		39700		39800		39900		40000		40100		40200		40300		40400		40500		40600		40700		40800		40900		41000		41100		41200		41300		41400		41500		41600		41700		41800		41900		42000		42100		42200		42300		42400		42500		42600		42700		42800		42900		43000		43100		43200		43300		43400		43500		43600		43700		43800		43900		44000		44100		44200		44300		44400		44500		44600		44700		44800		44900		45000		45100		45200		45300		45400		45500		45600		45700		45800		45900		46000		46100		46200		46300		46400		46500		46600		46700		46800		46900		47000		47100		47200		47300		47400		47500		47600		47700		47800		47900		48000		48100		48200		48300		48400		48500		48600		48700		48800		48900		49000		49100		49200		49300		49400		49500		49600		49700		49800		49900		50000		50100		50200		50300		50400		50500		50600		50700		50800		50900		51000		51100		51200		51300		51400		51500		51600		51700		51800		51900		52000		52100		52200		52300		52400		52500		52600		52700		52800		52900		53000		53100		53200		53300		53400		53500		53600		53700		53800		53900		54000		54100		54200		54300		54400		54500		54600		54700		54800		54900		55000		55100		55200		55300		55400		55500		55600		55700		55800		55900		56000		56100		56200		56300		56400		56500		56600		56700		56800		56900		57000		57100		57200		57300		57400		57500		57600		57700		57800		57900		58000		58100		58200		58300		58400		58500		58600		58700		58800		58900		59000		59100		59200		59300		59400		59500		59600		59700		59800		59900		60000		60100		60200		60300		60400		60500		60600		60700		60800		60900		61000		61100		61200		61300		61400		61500		61600		61700		61800		61900		62000		62100		62200		62300		62400		62500		62600		62700		62800		62900		63000		63100		63200		63300		63400		63500		63600		63700		63800		63900		64000		64100		64200		64300		64400		64500		64600		64700		64800		64900		65000		65100		65200		65300		65400		65500		65600		65700		65800		65900		66000		66100		66200		66300		66400		66500		66600		66700		66800		66900		67000		67100		67200		67300		67400		67500		67600		67700		67800		67900		68000		68100		68200		68300		68400		68500		68600		68700		68800		68900		69000		69100		69200		69300		69400		69500		69600		69700		69800		69900		70000		70100		70200		70300		70400		70500		70600		70700		70800		70900		71000		71100		71200		71300		71400		71500		71600		71700		71800		71900		72000		72100		72200		72300		72400		72500		72600		72700		7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Notes:  
BGL= Below Ground Level, BBC = Below Base of Existing Concrete  
Square in bolded line indicates exceedance of Dutch B Level  
Shaded square indicates exceedance of Dutch C Level  
Full analytical results should be referred to laboratory report







**CEDD Contract No. GE/2005/49  
Chemical and Biological Testing  
(Term Contract)**

**Works Order No. GE/2005/49.28**

**Agreement No. CE 35/2006 (CE)  
Kai Tak Development Engineering Study cum Design and  
Construction of Advance Works - Investigation,  
Design and Construction Cruise Terminal and  
Advance Works**

**Laboratory Testing of Soil and  
Groundwater Samples from ex-GFS Building  
and Radar Station**

**Chemical Analysis**

**Final Report (Radar Station)**

**CLIENT:**

**Geotechnical Projects Division**  
Geotechnical Engineering Office  
Civil Engineering and Development Department  
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**CERTIFIED BY:**

  
Maureen Chia Chi Chang  
PAAC

**DATE:**

11 December 2007

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## Chemical Analysis

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Soil

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## Metals

**TEST REPORT**

Report No. : 104503N(1)  
Project Name : Chemical and Biological Testing (Term Contract)  
Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and Groundwater Samples from ex-GFS Building and Radar Station  
Customer : Geotechnical Projects Division, Geotechnical Engineering office,  
Civil Engineering and Development Department  
Address : 23/FI., 410 Kwun Tong Road, Kwun Tong, Kowloon

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Lab Job No. : J546  
Lab Sample No. : 19996,20001,20005,20008,20027,20035  
Sample Description : 20 samples said to be soil  
Sample Receipt Date : 21 September 2007 - 29 September 2007  
Test Period : 22 September 2007 - 25 October 2007

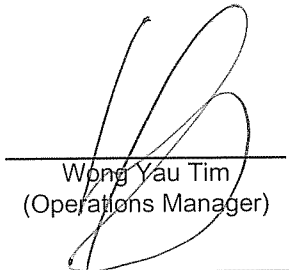
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**Test Information**

Code	Test Parameter	Reporting Limits	Test Procedure
		Sediment/Soil	
		mg/kg	
Cd	Cadmium	0.20	S/M/DIG-S & M/ICP-MS
Cr	Chromium	1.0	S/M/DIG-S & M/ICP-MS
Cu	Copper	1.0	S/M/DIG-S & M/ICP-MS
Ni	Nickel	1.0	S/M/DIG-S & M/ICP-MS
Pb	Lead	1.0	S/M/DIG-S & M/ICP-MS
Zn	Zinc	20	S/M/DIG-S & M/ICP-MS
Hg	Mercury	0.05	S/M/DIG-S & M/ICP-MS
As	Arsenic	1.0	S/M/DIG-S & M/ICP-MS
Co	Cobalt	0.50	S/M/DIG-S & M/ICP-MS
Mo	Molybdenum	1.0	S/M/DIG-S & M/ICP-MS
Sn	Tin	0.5	S/M/DIG-S & M/ICP-MS
Ba	Barium	0.5	S/M/DIG-S & M/ICP-MS

- Notes :
1. This report shall not be reproduced, except in full, without prior approval from Lam Laboratories Ltd.
  2. Results related to samples as received.
  3. Results are based on dry sample weight.
  4. < = less than
  5. NA = Not applicable
  6. Test results satisfy all in-house QA/QC protocols as attached.
  7. Test description (for in-house methods) as follows:  
S/M/DIG-S: Acid digestion.  
M/ICP-MS: ICP-MS Quantification.
  8. This report supersedes the one dated 17 Nov. 2007 with report no. 104503N.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date: 11 Dec. 2007

**TEST REPORT**

**Report No.** : 104503N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

---

**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035

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**Test Result**

Customer Ref.	Sample					Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba
Drillhole No.	Depth, m			Type	Specimen	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	No.	From	To		Depth, m												
RSB - 08	NA	2.35	2.80		NA	<0.20	2.7	11	1.5	27	59	0.16	1.2	0.89	1.1	2.7	44
RSB - 08	NA	3.35	3.80		NA	<0.20	1.8	6.7	<1.0	43	42	0.10	<1.0	1.2	1.4	1.8	18
RSB - 01	NA	NA	NA		1.00	<0.20	3.0	8.1	2.0	68	57	0.11	2.5	1.5	1.1	2.9	25
RSB - 02	NA	NA	NA		1.00	<0.20	4.0	4.4	1.8	28	23	<0.05	1.6	0.74	<1.0	3.2	11
RSB - 07	NA	NA	NA		1.00	<0.20	7.9	8.7	4.5	68	100	0.07	4.0	1.8	3.0	2.5	49
RSB - 08	NA	NA	NA		1.00	<0.20	1.3	32	4.4	46	35	<0.05	<1.0	2.7	<1.0	10	36
RSB - 02 (Duplicate)	NA	NA	NA		1.00	<0.20	2.0	9.9	13	130	20	<0.05	<1.0	5.7	<1.0	1.8	30
RSB - 02	NA	2.45	2.90		NA	<0.20	2.0	16	1.3	76	49	<0.05	1.2	1.5	<1.0	9.8	50
RSB - 02	NA	4.35	4.80		NA	<0.20	12	52	5.6	57	88	0.15	1.8	3.3	3.3	3.8	62
RSB - 07	NA	2.35	2.65		NA	0.21	6.2	26	4.0	62	120	0.06	2.2	1.8	1.8	2.6	32
RSB - 02	NA	5.85	6.30		NA	0.64	6.0	73	5.8	120	160	0.38	1.9	2.8	2.2	9.9	46
RSB - 02	NA	6.35	6.80		NA	<0.20	1.2	1.1	<1.0	66	<20	<0.05	<1.0	1.5	<1.0	2.2	27
RSB - 07	NA	5.35	5.80		NA	<0.20	3.6	9.1	2.2	87	100	0.14	2.0	2.2	1.1	4.3	50
RSB - 01	NA	2.35	2.80		NA	<0.20	3.1	13	1.9	69	82	0.08	1.4	1.7	1.0	2.9	23
RSB - 01	NA	3.35	3.80		NA	<0.20	5.3	8.5	1.4	54	42	0.08	<1.0	1.4	1.4	2.3	31
RSB - 01A	NA	2.35	2.80		NA	<0.20	1.4	6.0	<1.0	41	38	<0.05	<1.0	1.2	<1.0	2.1	27
RSB - 01A	NA	3.35	3.80		NA	<0.20	<1.0	2.1	<1.0	48	22	<0.05	<1.0	1.3	<1.0	2.2	11
RSB - 01A	NA	4.85	5.30		NA	0.45	4.8	65	2.2	47	120	0.06	1.3	2.2	1.1	5.8	86
RSB - 01A	NA	NA	NA		1.00	0.36	<1.0	1.6	<1.0	120	38	<0.05	1.0	0.62	2.9	1.2	14
RSB - 01A	NA	5.85	6.30		NA	0.65	16	71	16	64	220	0.12	1.6	7.2	3.7	10	120

-----End of Report-----

**QUALITY CONTROL REPORT**

**Report No.** : 104503N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


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**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035

**QC Results****1.1 Sample Duplicate (Relative deviation)**

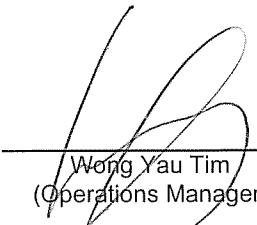
Customer Ref.	Sample					Batch	Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba
Drillhole No.	Depth, m			Type	Specimen		%	%	%	%	%	%	%	%	%	%	%	%
	No.	From	To		Depth m													
RSB - 01	NA	2.50	2.95		NA	1	*na	2.3	21	20	7.9	20	1.7	8.1	1.1	9.8	21	27
Control Limits							+/- 30 % of the mean											

**1.2 Method Spike (Standard Addition)**

Customer Ref.	Sample					Batch	Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba
Drillhole No.	Depth, m			Type	Specimen		%	%	%	%	%	%	%	%	%	%	%	%
	No.	From	To		Depth m													
RSB - 01	NA	2.50	2.95		NA	1	95	93	93	90	98	77	88	92	91	80	75	106
Control Limits							75 - 125 %											

Note: 1. \*na = Relative deviation(RD) for duplicates cannot be evaluated as the value determined is lower than reporting limits.

Authorized Signatory :

  
 Wong Yau Tim  
 (Operations Manager)

Issue Date: 11 Dec. 2007

**QUALITY CONTROL REPORT**

**Report No.** : 104503N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
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 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


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**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035

**QC Results****1.3 Sample Reference Material (ISE 2004.2.1)**

Reference	Sample					Batch	Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba
	Depth, m			Type	Specimen		%	%	%	%	%	%	%	%	%	%	%	%
	No.	From	To		Depth m													
ISE 2004.2.1	NA	NA	NA		NA	1	102	95	98	98	96	96	87	96	93	101	114	108
Control Limits							75 - 125% of nominal value											

**1.4 Method Blank**

Reference	Sample					Batch	Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba
	Depth, m			Type	Specimen		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	No.	From	To		Depth m													
NA	NA	NA	NA		NA	1	<0.20	<1.0	<1.0	<1.0	<1.0	<20	<0.05	<1.0	<0.50	<1.0	<0.50	<0.50
Control Limits							Less than reporting limit											



PAHs

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**TEST REPORT**

**Report No.** : 104505N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
Civil Engineering and Development Department  
**Address** : 23/FI., 410 Kwun Tong Road, Kwun Tong, Kowloon

---

**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035  
**Sample Description** : 20 samples said to be soil  
**Sample Receipt Date** : 21 September 2007 - 29 September 2007  
**Test Period** : 22 September 2007 - 25 October 2007

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**Test Information**


CODE	Test Parameter	Reporting Limit	Test Procedure
		mg/kg	
NAP	Naphthalene	0.05	S/O/PAH-S
PHE	Phenanthrene	0.05	S/O/PAH-S
ANT	Anthracene	0.05	S/O/PAH-S
BaP	Benzo(a)pyrene	0.05	S/O/PAH-S
FLT	Fluoranthene	0.05	S/O/PAH-S
PYR	Pyrene	0.05	S/O/PAH-S

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1. This report shall not be reproduced, except in full, without prior approval from Lam Laboratories Ltd.
  2. Results relate to samples as received.
  3. Results are based on dry sample weight.
  4. < = less than
  5. NA = Not applicable
  6. Test results satisfy all in-house QA/QC protocols as attached.
  7. Test description (for in-house methods only) as follows:  
S/O/PAH-S: Ultra-Sonic extraction and GC-MS Quantification.
  8. This report supersedes the one dated 17 Nov. 2007 with report no. 104505N.

Authorized Signatory :

Issue Date:

11 Dec. 2007

  
\_\_\_\_\_  
Wong Yau Tim  
(Operations Manager)



**TEST REPORT**

**Report No.** : 104505N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035  


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**Test Results**

Customer Ref. Drillhole No.	Sample					NAP	PHE	ANT	BaP	FLT	PYR
	Depth, m			Type	Specimen Depth m	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	No.	From	To								
RSB - 08	NA	2.35	2.80		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 08	NA	3.35	3.80		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 01	NA	NA	NA		1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 02	NA	NA	NA		1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 07	NA	NA	NA		1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 08	NA	NA	NA		1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 02 (Duplicate)	NA	NA	NA		1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 02	NA	2.45	2.90		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 02	NA	4.35	4.80		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 07	NA	2.35	2.65		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 02	NA	5.85	6.30		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 02	NA	6.35	6.80		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 07	NA	5.35	5.80		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 01	NA	2.35	2.80		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 01	NA	3.35	3.80		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 01A	NA	2.35	2.80		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 01A	NA	3.35	3.80		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 01A	NA	4.85	5.30		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 01A	NA	NA	NA		1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
RSB - 01A	NA	5.85	6.30		NA	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

-----End of Report-----

**QUALITY CONTROL REPORT**

**Report No.** : 104505N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035  


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**QC Results**

**1.1 Sample Duplicate**

Customer Ref.	Sample					Batch	NAP	PHE	ANT	BaP	FLT	PYR
Drillhole No.	Depth, m			Type	Specimen		%	%	%	%	%	%
	No.	From	To		Depth m							
19996/1	NA	NA	NA		NA	1	na*	na*	na*	na*	na*	na*
Control Limits							+/- 30 % of the mean					

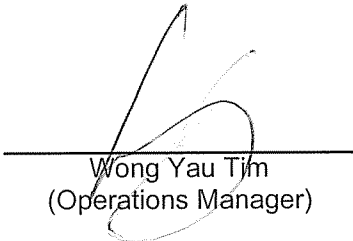
**1.2 Sample Spike (Spike Level = 5 ug)**

Customer Ref.	Sample					Batch	NAP	PHE	ANT	BaP	FLT	PYR
Drillhole No.	Depth, m			Type	Specimen		%	%	%	%	%	%
	No.	From	To		Depth m							
19996/1	NA	NA	NA		NA	1	95	101	110	101	82	86
Control Limits							70 - 130 %					

Notes :

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated  
as the value determined is lower than reporting limit.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date: : 11 Dec. 2007

**QUALITY CONTROL REPORT**

**Report No.** : 104505N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  


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**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035  


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**QC Results**

**1.3 QC Sample (SETOC 2002.4.4)**

Customer Ref.	Sample					Batch	NAP	PHE	ANT	BaP	FLT	PYR
Drillhole No.	Depth, m			Type	Specimen		%	%	%	%	%	%
	No.	From	To		Depth m							
SETOC 2002.4.4	NA	NA	NA		NA	1	107	112	102	98	97	103
Control Limits							70 - 130 % of nominal value					

**1.4 Method Blank**

Customer Ref.	Sample					Batch	NAP	PHE	ANT	BaP	FLT	PYR
Drillhole No.	Depth, m			Type	Specimen		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
	No.	From	To		Depth m							
NA	NA	NA	NA		NA	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Control Limits							Less than reporting limit					



TPH

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**TEST REPORT**

**Report No.** : 104506N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
Groundwater Samples from ex-GFS Building and Radar Station  
**Address** : Geotechnical Projects Division, Geotechnical Engineering office,  
Civil Engineering and Development Department  
**Client Address** : 23/FI., 410 Kwun Tong Road, Kwun Tong, Kowloon

---

**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035  
**Sample Description** : 20 samples said to be soil  
**Sample Receipt Date** : 21 September 2007 - 29 September 2007  
**Test Period** : 22 September 2007 - 25 October 2007

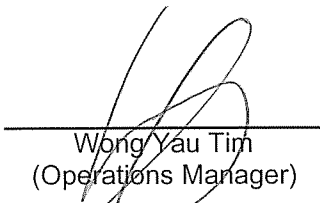
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**Test Information**

CODE	Test Parameter	Reporting Limit	Test Procedure
		mg/kg	
TPH	C6-C9	2.0	S/O/TPH
TPH	C10-C14	50	S/O/TPH
TPH	C15-C28	100	S/O/TPH
TPH	C29-C36	100	S/O/TPH

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  3. Results are based on dry sample weight.
  4. < = less than
  5. NA = Not applicable
  6. Test results satisfy all in-house QA/QC protocols as attached.
  7. Test description (for in-house methods only) as follows:  
S/O/TPH: Solvent extraction and GC-FID Quantification.
  8. This report supersedes the one dated 17 Nov. 2007 with report no. 104506N.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date: 11 Dec. 2007

**TEST REPORT**

**Report No.** : 104506N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035

**Test Results**

Customer Ref. Drillhole No.	Sample					C6-C9 mg/kg	C10-C14 mg/kg	C15-C28 mg/kg	C29-C36 mg/kg
	Depth, m			Type	Specimen Depth m				
	No.	From	To						
RSB - 08	NA	2.35	2.80		NA	<2.0	<50	<100	<100
RSB - 08	NA	3.35	3.80		NA	<2.0	<50	<100	<100
RSB - 01	NA	NA	NA		1.00	<2.0	<50	<100	<100
RSB - 02	NA	NA	NA		1.00	<2.0	<50	<100	<100
RSB - 07	NA	NA	NA		1.00	<2.0	<50	<100	<100
RSB - 08	NA	NA	NA		1.00	<2.0	<50	<100	<100
RSB - 02 (Duplicate)	NA	NA	NA		1.00	<2.0	<50	<100	<100
RSB - 02	NA	2.45	2.90		NA	<2.0	<50	<100	240
RSB - 02	NA	4.35	4.80		NA	<2.0	<50	<100	<100
RSB - 07	NA	2.35	2.65		NA	<2.0	<50	<100	<100
RSB - 02	NA	5.85	6.30		NA	<2.0	<50	<100	<100
RSB - 02	NA	6.35	6.80		NA	<2.0	<50	<100	<100
RSB - 07	NA	5.35	5.80		NA	<2.0	<50	<100	<100
RSB - 01	NA	2.35	2.80		NA	<2.0	<50	<100	<100
RSB - 01	NA	3.35	3.80		NA	<2.0	<50	130	280
RSB - 01A	NA	2.35	2.80		NA	<2.0	<50	<100	<100
RSB - 01A	NA	3.35	3.80		NA	<2.0	<50	<100	<100
RSB - 01A	NA	4.85	5.30		NA	<2.0	52	480	<100
RSB - 01A	NA	NA	NA		1.00	<2.0	<50	<100	<100
RSB - 01A	NA	5.85	6.30		NA	<2.0	<50	<100	110

-----End of Report-----

**QUALITY CONTROL REPORT**

**Report No.** : 104506N(1)  
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 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035

**QC Results****1.1 Sample Duplicate**

Customer Ref.	Sample					Batch	C6-C9	C10-C14	C15-C28	C29-C36
Drillhole No.	Depth, m			Type	Specimen		%	%	%	%
	No.	From	To		Depth m					
19996/1	NA	NA	NA		NA	1	na*	na*	na*	na*
Control Limit							+/- 30% of the mean			

**1.2 Sample Spike**


Customer Ref.	Sample					Batch	C6-C9	C10-C14	C15-C28	C29-C36
Drillhole No.	Depth, m			Type	Specimen		%	%	%	%
	No.	From	To		Depth m					
19996/1	NA	NA	NA		NA	1	89	88	93	110
Control Limit							70-130 %			

## Notes :

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

Authorized Signatory :

Issue Date: 11 Dec. 2007

  
 Wong Yau Tim  
 (Operations Manager)

**QUALITY CONTROL REPORT**

**Report No.** : 104506N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035

**QC Results****1.3 QC Sample**

Customer Ref.	Sample					Batch	C6-C9	C10-C14	C15-C28	C29-C36
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%
	No.	From	To							
NA	NA	NA	NA		NA	1	87	84	90	105
Control Limit							70-130 %			

**1.4 Method Blank**

Customer Ref.	Sample					Batch	C6-C9	C10-C14	C15-C28	C29-C36
Drillhole No.	Depth, m			Type	Specimen Depth m		mg/kg	mg/kg	mg/kg	mg/kg
	No.	From	To							
NA	NA	NA	NA		NA	1	<2.0	<50	<100	<100
Control Limit							Less than reporting limit			





## Phenols

**TEST REPORT**

**Report No.** : 104504N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
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**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
Civil Engineering and Development Department  
**Address** : 23/FI., 410 Kwun Tong Road, Kwun Tong, Kowloon

---

**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035  
**Sample Description** : 20 samples said to be soil  
**Sample Receipt Date** : 21 September 2007 - 29 September 2007  
**Test Period** : 22 September 2007 - 25 October 2007

---

**Test Information**

CODE	Test Parameter	Reporting Limit	Test Procedure
		mg/kg	
PL	Phenol	0.20	S/O/CPs-S
2-MP	2-Methylphenol	0.20	S/O/CPs-S
3/4-MP	3/4-Methylphenol	0.20	S/O/CPs-S

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  5. NA = Not applicable
  6. Test results satisfy all in-house QA/QC protocols as attached.
  7. Test description (for in-house methods only) as follows:  
S/O/CPs-S: Ultra-Sonic extraction and GC-MS Quantification.
  8. This report supersedes the one dated 17 Nov. 2007 with report no. 104504N.

Authorized Signatory :

  
Wong Yau Tim  
(Operations Manager)

Issue Date: 11 Dec. 2007

**TEST REPORT**

**Report No.** : 104504N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

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**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035

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**Test Results**

Customer Ref.	Sample					PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen Depth m	mg/kg	mg/kg	mg/kg
	No.	From	To					
RSB - 08	NA	2.35	2.80		NA	<0.20	<0.20	<0.20
RSB - 08	NA	3.35	3.80		NA	<0.20	<0.20	<0.20
RSB - 01	NA	NA	NA		1.00	<0.20	<0.20	<0.20
RSB - 02	NA	NA	NA		1.00	<0.20	<0.20	<0.20
RSB - 07	NA	NA	NA		1.00	<0.20	<0.20	<0.20
RSB - 08	NA	NA	NA		1.00	<0.20	<0.20	<0.20
RSB - 02 (Duplicate)	NA	NA	NA		1.00	<0.20	<0.20	<0.20
RSB - 02	NA	2.45	2.90		NA	<0.20	<0.20	<0.20
RSB - 02	NA	4.35	4.80		NA	<0.20	<0.20	<0.20
RSB - 07	NA	2.35	2.65		NA	<0.20	<0.20	<0.20
RSB - 02	NA	5.85	6.30		NA	<0.20	<0.20	<0.20
RSB - 02	NA	6.35	6.80		NA	<0.20	<0.20	<0.20
RSB - 07	NA	5.35	5.80		NA	<0.20	<0.20	<0.20
RSB - 01	NA	2.35	2.80		NA	<0.20	<0.20	<0.20
RSB - 01	NA	3.35	3.80		NA	<0.20	<0.20	<0.20
RSB - 01A	NA	2.35	2.80		NA	<0.20	<0.20	<0.20
RSB - 01A	NA	3.35	3.80		NA	<0.20	<0.20	<0.20
RSB - 01A	NA	4.85	5.30		NA	<0.20	<0.20	<0.20
RSB - 01A	NA	NA	NA		1.00	<0.20	<0.20	<0.20
RSB - 01A	NA	5.85	6.30		NA	<0.20	<0.20	<0.20

-----End of Report-----

**QUALITY CONTROL REPORT**

**Report No.** : 104504N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  


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**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035  


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**QC Results**

**1.1 Sample Duplicate**

Customer Ref.	Sample					Batch	PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen		%	%	%
	No.	From	To		Depth m				
19996/1	NA	NA	NA		NA	1	na*	na*	na*
Control Limit							+/- 30% of the mean		

**1.2 Sample Spike (Spike Level = 1 ug)**


Customer Ref.	Sample					Batch	PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen		%	%	%
	No.	From	To		Depth m				
19996/1	NA	NA	NA		NA	1	109	110	96
Control Limit							70-130 %		

Notes :

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

Authorized Signatory :

:

  
 Wong Yau Tim  
 (Operations Manager)

Issue Date:

:

11 Dec. 2007

**QUALITY CONTROL REPORT**

**Report No.** : 104504N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

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**Lab Job No.** : J546  
**Lab Sample No.** : 19996,20001,20005,20008,20027,20035

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**QC Results**

**2.1 QC Sample**

Customer Ref.	Sample					Batch	PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%
	No.	From	To						
NA	NA	NA	NA		NA	1	103	91	98
Control Limit							70-130 %		

**2.2 Method Blank**

Customer Ref.	Sample					Batch	PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen Depth m		mg/kg	mg/kg	mg/kg
	No.	From	To						
NA	NA	NA	NA		NA	1	<0.20	<0.20	<0.20
Control Limit							Less than reporting limit		



**BTEX &  
Chlorinated Hydrocarbons - Aliphatics**

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**TEST REPORT**

**Report No.** : 104515N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Civil Engineering and Development Department  
**Address** : 23/F., 410 Kwun Tong Road, Kwun Tong, Kowloon  


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**Lab Job No.** : J546 **Lab Sample No.** : 19996,20001,20005,20008  
**Sample Description** : TWENTY (20) Samples said to be Soil 20027,20036  
**Sample Receipt Date** : 21/09/2007 - 29/09/2007 **Test Period** : 30/9/2007- 25/10/2007  
**Test Information**


Code	Parameter	RL (mg/kg)	Test Method
Ben	Benzene	0.20	S/O/VOC
Tol	Toluene	0.20	
EtB	Ethylbenzene	0.20	
m,p-Xyl	m,p-xylene	0.40	
o-Xyl	o-xylene	0.20	
1,1-DCEE	1,1-Dichloroethene	0.50	
T-1,2-DCEE	trans-1,2-Dichloroethene	0.50	
1,1-DCE	1,1-Dichloroethane	0.50	
C-1,2-DCEE	cis-1,2-Dichloroethene	0.50	
1,1,1-TCE	1,1,1-Trichloroethane	0.50	
1,1-DCP	1,1-Dichloropropene	0.50	
TCM	Tetrachloromethane	0.50	
1,2-DCE	1,2-Dichloroethane	0.50	
TCE	Trichloroethene	0.50	
DBM	Dibromomethane	0.50	
1,1,2-TCE	1,1,2-Trichloroethane	0.50	
1,3-DCP	1,3-Dichloropropane	0.50	
TCEE	Tetrachloroethene	0.50	
1,1,1,2-TCE	1,1,1,2-Tetrachloroethane	0.50	
1,1,2,2-TCE	1,1,2,2-Tetrachloroethane	0.50	
1,2,3-TCP	1,2,3-Trichloropropane	0.50	
1,2-D-3-CP	1,2-Dibromo-3-chloropropane	0.50	
HCB	Hexachlorobutadiene	0.50	

- Notes :
1. This report shall not be reproduced, except in full, without prior written approval from Lam Laboratories Limited.
  2. < = less than.
  3. NA = Not applicable.
  4. Results related to sample(s) as received.
  5. Results are based on dry sample weight.
  6. Test results satisfy all in-house QA /QC protocols as attached.
  7. Sample information was provided by client.
  8. RL = Reporting limit.
  9. Test description (for in-house methods only) as follows,  
S/O/VOC : Extraction follow by quantification with purge-and-trap and GC-MS.
  - 10 This report supersedes the one dated 17 Nov. 2007 with report no. 104515N.

Authorized Signatory :

Issue Date :

11 Dec. 2007

  
 WONG Yau Tim  
 (Operations Manager)

Lam Laboratories Limited Unit 12, 14/F., Honour Industrial Centre, 6 Sun Yip Street, Chai Wan, Hong Kong.  
 Tel: (852) 2897 3282 Fax: (852) 2897 5509 e-mail: [info@lamlab.com](mailto:info@lamlab.com)

**TEST REPORT**

Report No. : 104515N(1)  
 Project Name : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
 Customer : Civil Engineering and Development Department  
 Lab Job No. : J546 Lab Sample No. : 19996,20001,20005,20008  
 20027,20036

**Test Results**

Customer Ref.			Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
Drillhole	Depth		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
	From	To								
RSB - 08	2.35	2.80	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 08	3.35	3.80	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 01	1.00	1.00	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 02	1.00	1.00	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 07	1.00	1.00	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 08	1.00	1.00	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 02 (Duplicate)	1.00	1.00	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 02	2.45	2.90	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 02	4.35	4.80	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 07	2.35	2.65	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 02	5.85	6.30	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 02	6.35	6.80	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 07	5.35	5.80	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 01	2.35	2.80	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 01	3.35	3.80	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 01A	2.35	2.80	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 01A	3.35	3.80	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 01A	4.85	5.30	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 01A	1.00	1.00	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50
RSB - 01A	5.85	6.30	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50



**TEST REPORT**

Report No. : 104515N(1)  
 Project Name : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
 Customer : Civil Engineering and Development Department  
 Lab Job No. : J546 Lab Sample No. : 19996,20001,20005,20008  
 20027,20036

**Test Results**

Customer Ref.			C-1,2- DCEE	1,1,1- TCE	1,1- DCP	TCM	1,2- DCE	TCE	DBM	1,1,2- TCE
Drillhole	Depth		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
	From	To								
RSB - 08	2.35	2.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 08	3.35	3.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 01	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 02	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 07	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 08	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 02 (Duplicate)	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 02	2.45	2.90	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 02	4.35	4.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 07	2.35	2.65	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 02	5.85	6.30	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 02	6.35	6.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 07	5.35	5.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 01	2.35	2.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 01	3.35	3.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 01A	2.35	2.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 01A	3.35	3.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 01A	4.85	5.30	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 01A	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
RSB - 01A	5.85	6.30	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

**TEST REPORT**

Report No. : 104515N(1)  
 Project Name : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
 Customer : Civil Engineering and Development Department  
 Lab Job No. : J546 Lab Sample No. : 19996,20001,20005,20008  
 20027,20036

**Test Results**

Customer Ref.			1,3- DCP (mg/kg)	TCEE (mg/kg)	1,1,1,2- TCE (mg/kg)	1,1,2,2- TCE (mg/kg)	1,2,3- TCP (mg/kg)	1,2-D- 3-CP (mg/kg)	HCB (mg/kg)	
Drillhole	Depth									
	From	To								
RSB - 08	2.35	2.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 08	3.35	3.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 01	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 02	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 07	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 08	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 02 (Duplicate)	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 02	2.45	2.90	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 02	4.35	4.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 07	2.35	2.65	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 02	5.85	6.30	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 02	6.35	6.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 07	5.35	5.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 01	2.35	2.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 01	3.35	3.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 01A	2.35	2.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 01A	3.35	3.80	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 01A	4.85	5.30	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 01A	1.00	1.00	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
RSB - 01A	5.85	6.30	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	

- End of report -

**QUALITY CONTROL REPORT**

**Report No.** : 104515N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Civil Engineering and Development Department  
**Lab Job No.** : J546 **Lab Sample No.** : 19996,20001,20005,20008  
 20027,20036

**QC Results**

Sample Duplicate	Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
RSB - 08 2.50-2.95	na*	na*	na*	na*	na*	na*	na*	na*
Acceptance Criteria	100 ± 25 %							

Sample Duplicate	C-1,2-DCEE	1,1,1-TCE	1,1-DCP	TCM	1,2-DCE	TCE	DBM	1,1,2-TCE
RSB - 08 2.50-2.95	na*	na*	na*	na*	na*	na*	na*	na*
Acceptance Criteria	100 ± 25 %							

Sample Duplicate	1,3-DCP	TCEE	1,1,1,2-TCE	1,1,2,2-TCE	1,2,3-TCP	1,2-D-3-CP	HCB	
RSB - 08 2.50-2.95	na*	na*	na*	na*	na*	na*	na*	
Acceptance Criteria	100 ± 25 %							

Sample Spike	Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
RSB - 08 2.50-2.95	112	105	107	105	95	99	91	83
Acceptance Criteria	100 ± 25 %							

Sample Spike	C-1,2-DCEE	1,1,1-TCE	1,1-DCP	TCM	1,2-DCE	TCE	DBM	1,1,2-TCE
RSB - 08 2.50-2.95	122	116	107	112	106	91	87	85
Acceptance Criteria	100 ± 25 %							

Sample Spike	1,3-DCP	TCEE	1,1,1,2-TCE	1,1,2,2-TCE	1,2,3-TCP	1,2-D-3-CP	HCB	
RSB - 08 2.50-2.95	105	106	93	91	99	85	87	
Acceptance Criteria	100 ± 25 %							

**Notes :**

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

**Authorized Signatory :****Issue Date**

: 11 Dec. 2007

  
 WONG Yau Tim  
 ( Operations Manager )

**Lam Laboratories Limited** Unit 12, 14/F., Honour Industrial Centre, 6 Sun Yip Street, Chai Wan, Hong Kong.  
 Tel: (852) 2897 3282 Fax: (852) 2897 5509 e-mail: [info@lamlab.com](mailto:info@lamlab.com)

**QUALITY CONTROL REPORT**

**Report No.** : 104515N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Civil Engineering and Development Department  
**Lab Job No.** : J546 **Lab Sample No.** : 19996,20001,20005,20008  
 20027,20036

**QC Results**

Method Blank	Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
NA	< 0.20	< 0.20	< 0.20	< 0.40	< 0.20	< 0.50	< 0.50	< 0.50

Method Blank	C-1,2-DCEE	1,1,1-TCE	1,1-DCP	TCM	1,2-DCE	TCE	DBM	1,1,2-TCE
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
NA	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Method Blank	1,3-DCP	TCEE	1,1,1,2-TCE	1,1,2,2-TCE	1,2,3-TCP	1,2-D-3-CP	HCB	
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
NA	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	

Lab. Control Sample	Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
QC	106	112	107	117	96	91	85	88
Acceptance Criteria	100 ± 25 %							

Lab. Control Sample	C-1,2-DCEE	1,1,1-TCE	1,1-DCP	TCM	1,2-DCE	TCE	DBM	1,1,2-TCE
QC	121	114	102	91	78	76	89	82
Acceptance Criteria	100 ± 25 %							

Lab. Control Sample	1,3-DCP	TCEE	1,1,1,2-TCE	1,1,2,2-TCE	1,2,3-TCP	1,2-D-3-CP	HCB	
QC	121	123	117	120	109	97	96	
Acceptance Criteria	100 ± 25 %							



Groundwater

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## Metals

**TEST REPORT**

**Report No.** : 104507N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  
**Address** : 23/FI., 410 Kwun Tong Road, Kwun Tong, Kowloon  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037  
**Sample Description** : 7 liquid samples said to be water  
**Sample Receipt Date** : 25 September 2007 - 2 October 2007  
**Test Period** : 26 September 2007 - 25 October 2007

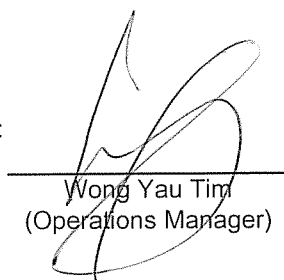
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**Test Information**

Code	Test Parameter	Reporting Limits	Test Procedure
		Water & waste water	
		ug/L	
Cd	Cadmium	1.0	W/M/DIG-RAR & M/ICP-MS
Cr	Chromium	1.0	W/M/DIG-RAR & M/ICP-MS
Cu	Copper	1.0	W/M/DIG-RAR & M/ICP-MS
Ni	Nickel	1.0	W/M/DIG-RAR & M/ICP-MS
Pb	Lead	1.0	W/M/DIG-RAR & M/ICP-MS
Zn	Zinc	50	W/M/DIG-RAR & M/ICP-MS
Hg	Mercury	0.50	W/M/DIG-RAR & M/ICP-MS
As	Arsenic	10	W/M/DIG-RAR & M/ICP-MS
Co	Cobalt	1.0	W/M/DIG-RAR & M/ICP-MS
Mo	Molybdenum	1.0	W/M/DIG-RAR & M/ICP-MS
Sn	Tin	1.0	W/M/DIG-RAR & M/ICP-MS
Ba	Barium	1.0	W/M/DIG-RAR & M/ICP-MS

- Notes :
1. This report shall not be reproduced, except in full, without prior approval from Lam Laboratories Ltd.
  2. < = less than
  3. NA = Not applicable
  4. Test results satisfy all in-house QA/QC protocols as attached.
  5. Test description (for in-house methods) as follows:  
W/M/DIG-RAR: Acid digestion.
  6. M/ICP-MS: ICP-MS Quantification.
  7. This report supersedes the one dated 17 Nov. 2007 with report no. 104507N.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date: 11 Dec. 2007

**TEST REPORT**

**Report No.** : 104507N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037

---

**Test Results**

Customer Ref.	Sample					Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba
Drillhole No.	Depth, m			Type	Specimen												
	No.	From	To														
RSB - 08	NA	NA	NA		2.13	1.2	14	1.3	11	450	510	<0.50	<10	9.6	6.2	3.6	640
Field Blank (RS)	NA	NA	NA		NA	<1.0	<1.0	52	<1.0	<1.0	<50	<0.5	<10	<1.0	<1.0	1.8	<1.0
Equipment Blank (RS)	NA	NA	NA		NA	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<0.5	<10	<1.0	<1.0	1.8	<1.0
RSB - 01	NA	NA	NA		2.09	3.2	12	76	16	1600	700	<0.50	<10	14	4.4	2.9	390
RSB - 02	NA	NA	NA		2.03	<1.0	11	47	7.2	410	310	<0.50	<10	5.5	12	2.7	170
RSB - 07	NA	NA	NA		2.09	<1.0	10	18	3.5	210	73	<0.50	<10	2.5	5.0	3.1	210
RSB - 01A	NA	NA	NA		2.05	3.8	14	92	10	1300	670	<0.50	<10	8.3	20	4.6	250

-----End of Report-----



**QUALITY CONTROL REPORT**

**Report No.** : 104507N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  
**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037

**Test Results****1.1 Sample Duplicate (Relative deviation)**

Customer Ref.	Sample					Batch	Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba
Drillhole No.	Depth, m			Type	Specimen		%	%	%	%	%	%	%	%	%	%	%	%
	No.	From	To		Depth m													
19963/14	NA	NA	NA		NA	1	*na	*na	2.0	*na	*na	*na	*na	*na	*na	*na	5.9	*na
Control Limits						+/- 30 % of the mean												

**1.2 Method Spike (Standard Addition)**

Customer Ref.	Sample					Batch	Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba
Drillhole No.	Depth, m			Type	Specimen		%	%	%	%	%	%	%	%	%	%	%	%
	No.	From	To		Depth m													
19963/14	NA	NA	NA		NA	1	77	87	83	85	98	88	82	94	87	90	111	108
Control Limits						75 - 125 %												

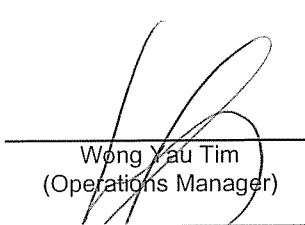
**1.3 Method Blank**

Reference	Sample					Batch	Cd	Cr	Cu	Ni	Pb	Zn	Hg	As	Co	Mo	Sn	Ba
	Depth, m			Type	Specimen		ug/L											
	No.	From	To		Depth m													
N/A	N/A	N/A	N/A		N/A	1	<1.0	<1.0	<1.0	<1.0	<1.0	<50	<0.5	<10	<1.0	<1.0	<1.0	<1.0
Control Limits						Less than reporting limit												

Note: 1. \*na = Relative deviation(RD) for duplicates cannot be evaluated as the value determined is lower than reporting limits.  
 2. < = less than

Authorized Signatory :

Issue Date: 11 Dec. 2007

  
 Wong Yau Tim  
 (Operations Manager)



PAHs

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**TEST REPORT**

**Report No.** : 104509N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
Civil Engineering and Development Department  
**Address** : 23/FI., 410 Kwun Tong Road, Kwun Tong, Kowloon

---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037  
**Sample Description** : 7 liquid samples said to be water  
**Sample Receipt Date** : 25 September 2007 - 2 October 2007  
**Test Period** : 26 September 2007 - 25 October 2007

---

**Test Information**

CODE	Test Parameter	Reporting Limit	Test Procedure
		ug/L	
NAP	Naphthalene	0.10	W/O/PAH
PHE	Phenanthrene	0.10	W/O/PAH
ANT	Anthracene	0.10	W/O/PAH
BaP	Benzo(a)pyrene	0.10	W/O/PAH
FLT	Fluoranthene	0.10	W/O/PAH
PYR	Pyrene	0.10	W/O/PAH

- Notes :
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  3. < = less than
  4. NA = Not applicable
  5. Test results satisfy all in-house QA/QC protocols as attached.
  6. Test description ( for in-house methods) as follows:  
W/O/PAH: Solvent extraction and GC-MS Quantification.
  7. This report supersedes the one dated 17 Nov. 2007 with report no. 104509N.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date: 11 Dec. 2007

**TEST REPORT**

**Report No.** : 104509N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037

**Test Results**

Customer Ref.	Sample					NAP	PHE	ANT	BaP	FLT	PYR
	Depth, m			Type	Specimen Depth m	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	No.	From	To								
RSB - 08	NA	NA	NA		2.13	<0.10	2.3	0.25	<0.10	0.72	0.69
Field Blank (RS)	NA	NA	NA		NA	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Equipment Blank (RS)	NA	NA	NA		NA	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
RSB - 01	NA	NA	NA		2.09	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
RSB - 02	NA	NA	NA		2.03	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
RSB - 07	NA	NA	NA		2.09	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
RSB - 01A	NA	NA	NA		2.05	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

-----End of Report-----

**QUALITY CONTROL REPORT**

**Report No.** : 104509N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


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**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037  


---

**QC Results**

**1.1 Sample Duplicate**

Customer Ref.	Sample					Batch	NAP	PHE	ANT	BaP	FLT	PYR
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%	%	%
	No.	From	To									
20008/3	NA	NA	NA		NA	1	na*	18	7.7	na*	11	1.4
Control Limits							+/- 30 % of the mean					

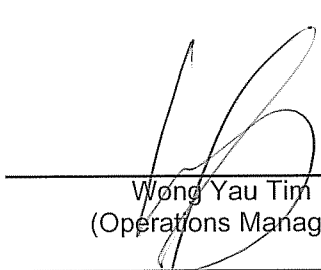
**1.2 Sample Spike (Spike Level = 5 ug)**

Customer Ref.	Sample					Batch	NAP	PHE	ANT	BaP	FLT	PYR
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%	%	%
	No.	From	To									
20008/4	NA	NA	NA		NA	1	95	90	104	89	96	95
Control Limits							70 - 130 %					

Notes :

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated  
as the value determined is lower than reporting limit.

Authorized Signatory :

  
 Wong Yau Tim  
 (Operations Manager)

Issue Date: 11 Dec. 2007

**QUALITY CONTROL REPORT**

**Report No.** : 104509N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


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**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037  


---

**QC Results**

**1.3 QC Sample (Spike Level = 5 ug)**

Customer Ref.	Sample					Batch	NAP	PHE	ANT	BaP	FLT	PYR
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%	%	%
	No.	From	To									
MB Spike	NA	NA	NA		NA	1	92	90	101	88	102	100
Control Limits							70 - 130 %					

**1.4 Method Blank**

Customer Ref.	Sample					Batch	NAP	PHE	ANT	BaP	FLT	PYR
Drillhole No.	Depth, m			Type	Specimen Depth m		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	No.	From	To									
NA	NA	NA	NA		NA	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Control Limits							Less than reporting limit					



TPH

---

**TEST REPORT**

**Report No.** : 104510N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
Civil Engineering and Development Department  
**Address** : 23/FI., 410 Kwun Tong Road, Kwun Tong, Kowloon

---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037  
**Sample Description** : 7 liquid samples said to be water  
**Sample Receipt Date** : 25 September 2007 - 2 October 2007  
**Test Period** : 26 September 2007 - 25 October 2007

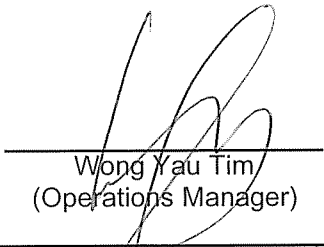
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**Test Information****Total Petroleum Hydrocarbons**

CODE	Test Parameter	Reporting Limit	Test Procedure
		ug/L	
TPH	C6-C9	20	W/O/TPH
TPH	C10-C14	25	W/O/TPH
TPH	C15-C28	25	W/O/TPH
TPH	C29-C36	25	W/O/TPH

- Notes :
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  2. < = less than
  3. NA = Not applicable
  4. Test results satisfy all in-house QA/QC protocols as attached.
  5. Test description (for in-house methods only) as follows:  
W/O/TPH: Solvent extraction and GC-FID Quantification.
  6. Results relate to samples as received.
  7. This report supersedes the one dated 17 Nov. 2007 with report no. 104510N.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date: 11 Dec. 2007



**TEST REPORT**

**Report No.** : 104510N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037

**Test Results****Total Petroleum Hydrocarbons**

Customer Ref.	Sample					C6-C9	C10-C14	C15-C28	C29-C36
Drillhole No.	Depth, m			Type	Specimen	ug/L	ug/L	ug/L	ug/L
	No.	From	To		Depth m				
RSB - 08	NA	NA	NA		2.13	<20	35	170	25
Field Blank (RS)	NA	NA	NA		NA	<20	<25	<25	<25
Equipment Blank (RS)	NA	NA	NA		NA	<20	<25	270	540
RSB - 01	NA	NA	NA		2.09	<20	91	660	2100
RSB - 02	NA	NA	NA		2.03	<20	38	330	47
RSB - 07	NA	NA	NA		2.09	<20	<25	120	<25
RSB - 01A	NA	NA	NA		2.05	<20	34	180	<25

-----End of Report-----

**QUALITY CONTROL REPORT**

**Report No.** : 104510N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037

**QC Results****Total Petroleum Hydrocarbons****1.1 Sample Duplicate**

Customer Ref.	Sample					Batch	C6-C9	C10-C14	C15-C28	C29-C36
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%
	No.	From	To							
20008/3	NA	NA	NA		NA	1	na*	na*	na*	na*
Control Limit							+/- 30% of the mean			

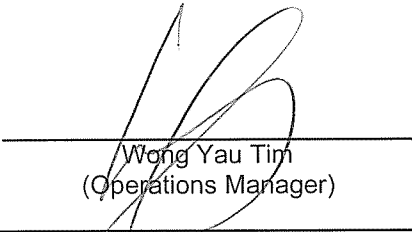
**1.2 Sample Spike**

Customer Ref.	Sample					Batch	C6-C9	C10-C14	C15-C28	C29-C36
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%
	No.	From	To							
20008/4	NA	NA	NA		NA	1	97	102	106	118
Control Limit							70-130 %			

**Notes :**

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated  
as the value determined is lower than reporting limit.

Authorized Signatory :

  
 Wong Yau Tim  
 (Operations Manager)

Issue Date: 11 Dec. 2007

**QUALITY CONTROL REPORT**

**Report No.** : 104510N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037

**QC Results****Total Petroleum Hydrocarbons****1.3 QC Sample**

Customer Ref.	Sample					Batch	C6-C9	C10-C14	C15-C28	C29-C36
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%	%
	No.	From	To							
NA	NA	NA	NA		NA	1	99	96	102	111
Control Limit							70-130 %			

**1.4 Method Blank**

Customer Ref.	Sample					Batch	C6-C9	C10-C14	C15-C28	C29-C36
Drillhole No.	Depth, m			Type	Specimen Depth m		ug/L	ug/L	ug/L	ug/L
	No.	From	To							
NA	NA	NA	NA		NA	1	<20	<25	<25	<25
Control Limit							Less than reporting limit			



## Phenols

**TEST REPORT**

**Report No.** : 104508N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
Civil Engineering and Development Department  
**Address** : 23/FI., 410 Kwun Tong Road, Kwun Tong, Kowloon

---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037  
**Sample Description** : 7 liquid samples said to be water  
**Sample Receipt Date** : 25 September 2007 - 2 October 2007  
**Test Period** : 26 September 2007 - 25 October 2007

---

**Test Information**

CODE	Test Parameter	Reporting Limit	Test Procedure
		ug/L	
PL	Phenol	0.50	W/O/CPs
2-MP	2-Methylphenol	0.50	W/O/CPs
3/4-MP	3/4-Methylphenol	0.50	W/O/CPs

- Notes :
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  3. < = less than
  4. NA = Not applicable
  5. Test results satisfy all in-house QA/QC protocols as attached.
  6. Test description (for in-house methods only) as follows:  
W/O/CPs: Solvent extraction and GC-MS Quantification.
  7. This report supersedes the one dated 17 Nov. 2007 with report no. 104508N.

Authorized Signatory : \_\_\_\_\_

Wong Yau Tim  
(Operations Manager)

Issue Date: 11 Dec. 2007

**TEST REPORT**

**Report No.** : 104508N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office,  
 Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037  


---

**Test Results**

Customer Ref.	Sample					PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen Depth m	ug/L	ug/L	ug/L
	No.	From	To					
RSB - 08	NA	NA	NA		2.13	<0.50	<0.50	<0.50
Field Blank (RS)	NA	NA	NA		NA	<0.50	<0.50	<0.50
Equipment Blank (RS)	NA	NA	NA		NA	<0.50	<0.50	<0.50
RSB - 01	NA	NA	NA		2.09	<0.50	<0.50	<0.50
RSB - 02	NA	NA	NA		2.03	<0.50	<0.50	<0.50
RSB - 07	NA	NA	NA		2.09	<0.50	<0.50	<0.50
RSB - 01A	NA	NA	NA		2.05	<0.50	<0.50	<0.50

-----End of Report-----

**QUALITY CONTROL REPORT**

**Report No.** : 104508N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  


---

**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037  


---

**QC Results**

**1.1 Sample Duplicate**

Customer Ref.	Sample					Batch	PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%
	No.	From	To						
20008/3	NA	NA	NA		NA	1	na*	na*	na*
Control Limit							+/- 30% of the mean		

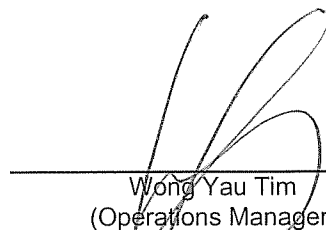
**1.2 Sample Spike (Spike Level = 1 ug)**

Customer Ref.	Sample					Batch	PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen Depth m		%	%	%
	No.	From	To						
20008/4	NA	NA	NA		NA	1	110	105	86
Control Limit							70-130 %		

Notes :

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

Authorized Signatory :



Wong Yau Tim  
(Operations Manager)

Issue Date: : 11 Dec. 2007

**QUALITY CONTROL REPORT**

**Report No.** : 104508N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Geotechnical Projects Division, Geotechnical Engineering office, Civil Engineering and Development Department  


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**Lab Job No.** : J546  
**Lab Sample No.** : 20008,20020,20037  


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**QC Results**

**2.1 QC Sample**

Customer Ref.	Sample					Batch	PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen Depth m				
	No.	From	To				%	%	%
NA	NA	NA	NA		NA	1	108	104	94
Control Limit							70-130 %		

**2.2 Method Blank**

Customer Ref.	Sample					Batch	PL	2-MP	3/4-MP
Drillhole No.	Depth, m			Type	Specimen Depth m				
	No.	From	To				ug/L	ug/L	ug/L
NA	NA	NA	NA		NA	1	<0.05	<0.05	<0.05
Control Limit							Less than reporting limit		





**BTEX &  
Chlorinated Hydrocarbons - Aliphatics**

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**TEST REPORT**

**Report No.** : 104516N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Civil Engineering and Development Department  
**Address** : 23/F., 410 Kwun Tong Road, Kwun Tong, Kowloon  


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**Lab Job No.** : J546 **Lab Sample No.** : 20008,20020,20037  
**Sample Description** : SEVEN (7) Samples said to be Water  
**Sample Receipt Date** : 25/9/2007 - 2/10/2007 **Test Period** : 26/9/2007- 25/10/2007  


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**Test Information**

Code	Parameter	RL	(µg/L)	Test Method
Ben	Benzene	1.0		W/O/VOC
Tol	Toluene	15		
EtB	Ethylbenzene	15		
m,p-Xyl	m,p-xylene	15		
o-Xyl	o-xylene	15		
1,1-DCEE	1,1-Dichloroethene	2.0		
T-1,2-DCEE	trans-1,2-Dichloroethene	2.0		
1,1-DCE	1,1-Dichloroethane	2.0		
C-1,2-DCEE	cis-1,2-Dichloroethene	2.0		
1,1,1-TCE	1,1,1-Trichloroethane	2.0		
1,1-DCP	1,1-Dichloropropene	2.0		
TCM	Tetrachloromethane	2.0		
1,2-DCE	1,2-Dichloroethane	2.0		
TCE	Trichloroethene	2.0		
DBM	Dibromomethane	2.0		
1,1,2-TCE	1,1,2-Trichloroethane	2.0		
1,3-DCP	1,3-Dichloropropane	2.0		
TCEE	Tetrachloroethene	2.0		
1,1,1,2-TCE	1,1,1,2-Tetrachloroethane	2.0		
1,1,2,2-TCE	1,1,2,2-Tetrachloroethane	2.0		
1,2,3-TCP	1,2,3-Trichloropropane	2.0		
1,2-D-3-CP	1,2-Dibromo-3-chloropropane	2.0		
HCB	Hexachlorobutadiene	2.0		

- Notes :
- This report shall not be reproduced, except in full, without prior written approval from Lam Laboratories Limited.
  - < = less than.
  - NA = Not applicable.
  - Results related to sample(s) as received.
  - Results are based on dry sample weight.
  - Test results satisfy all in-house QA /QC protocols as attached.
  - Sample information was provided by client.
  - RL = Reporting limit.
  - Test description (for in-house methods only) as follows,  
W/O/VOC : Extraction follow by quantification with purge-and-trap and GC-MS.
  - This report supersedes the one dated 17 Nov. 2007 with report no. 104516N.

Authorized Signatory :

Issue Date

: 11 Dec. 2007

  
 WONG Yau Tim  
 ( Operations Manager )

Lam Laboratories Limited

Unit 12/14/F., Honour Industrial Centre, 6 Sun Yip Street, Chai Wan, Hong Kong.  
 Tel: (852) 2897 3282 Fax: (852) 2897 5509 e-mail: [info@lamlab.com](mailto:info@lamlab.com)

**TEST REPORT**

**Report No.** : 104516N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design  
 and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and  
 Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Civil Engineering and Development Department  
**Lab Job No.** : J546 **Lab Sample No.** : 20008,20020,20037  
**Test Results**

Customer Ref.		Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
Drillhole	Depth	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
RSB - 08	2.13	< 1.0	< 15	< 15	< 15	< 15	< 2.0	< 2.0	< 2.0
Field Blank (RS)	NA	< 1.0	< 15	< 15	< 15	< 15	< 2.0	< 2.0	< 2.0
Equipment Blank (RS)	NA	< 1.0	< 15	< 15	< 15	< 15	< 2.0	< 2.0	< 2.0
RSB - 01	2.09	< 1.0	< 15	< 15	< 15	< 15	< 2.0	< 2.0	< 2.0
RSB - 02	2.03	< 1.0	< 15	< 15	< 15	< 15	< 2.0	< 2.0	< 2.0
RSB - 07	2.09	< 1.0	< 15	< 15	< 15	< 15	< 2.0	< 2.0	< 2.0
RSB - 01A	2.05	< 1.0	< 15	< 15	< 15	< 15	< 2.0	< 2.0	< 2.0

Customer Ref.		C-1,2-DCEE	1,1,1-TCE	1,1-DCP	TCM	1,2-DCE	TCE	DBM	1,1,2-TCE
Drillhole	Depth	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
RSB - 08	2.13	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Field Blank (RS)	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Equipment Blank (RS)	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
RSB - 01	2.09	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
RSB - 02	2.03	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
RSB - 07	2.09	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
RSB - 01A	2.05	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Customer Ref.		1,3-DCP	TCEE	1,1,1,2-TCE	1,1,2,2-TCE	1,2,3-TCP	1,2-D-3-CP	HCB
Drillhole	Depth	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
RSB - 08	2.13	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Field Blank (RS)	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Equipment Blank (RS)	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
RSB - 01	2.09	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
RSB - 02	2.03	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
RSB - 07	2.09	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
RSB - 01A	2.05	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

-End of report-

**QUALITY CONTROL REPORT**

**Report No.** : 104516N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Civil Engineering and Development Department  
**Lab Job No.** : J546 **Lab Sample No.** : 20008,20020,20037

**QC Results**

Sample Duplicate	Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
RSB - 08	na*	na*	na*	na*	na*	na*	na*	na*
Acceptance Criteria	RSD $\pm$ 25 %							

Sample Duplicate	C-1,2-DCEE	1,1,1-TCE	1,1-DCP	TCM	1,2-DCE	TCE	DBM	1,1,2-TCE
RSB - 08	na*	na*	na*	na*	na*	na*	na*	na*
Acceptance Criteria	RSD $\pm$ 25 %							

Sample Duplicate	1,3-DCP	TCEE	1,1,1,2-TCE	1,1,2,2-TCE	1,2,3-TCP	1,2-D-3-CP	HCB	
RSB - 08	na*	na*	na*	na*	na*	na*	na*	
Acceptance Criteria	RSD $\pm$ 25 %							

Sample Spike	Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
RSB - 08	115	83	87	94	91	101	106	100
Acceptance Criteria	100 $\pm$ 25 %							

Sample Spike	C-1,2-DCEE	1,1,1-TCE	1,1-DCP	TCM	1,2-DCE	TCE	DBM	1,1,2-TCE
RSB - 08	108	87	91	94	93	96	112	113
Acceptance Criteria	100 $\pm$ 25 %							

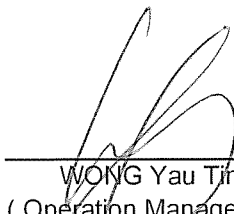
Sample Spike	1,3-DCP	TCEE	1,1,1,2-TCE	1,1,2,2-TCE	1,2,3-TCP	1,2-D-3-CP	HCB	
RSB - 08	109	110	87	88	85	92	97	
Acceptance Criteria	100 $\pm$ 25 %							

**Notes :**

1. na\* = Relative deviation (RD) for duplicates cannot be evaluated as the value determined is lower than reporting limit.

**Authorized Signatory** :**Issue Date** :

11 Dec. 2007

  
 WONG Yau Tim  
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**QUALITY CONTROL REPORT**

**Report No.** : 104516N(1)  
**Project Name** : Chemical and Biological Testing (Term Contract)  
 Agreement No. CE 35/2006(CE) Kai Tak Development Engineering Study cum Design and Construction Cruise Terminal and Advance Works Laboratory Testing of Soil and Groundwater Samples from ex-GFS Building and Radar Station  
**Customer** : Civil Engineering and Development Department  
**Lab Job No.** : J546 **Lab Sample No.** : 20008,20020,20037

**QC Results**

Method Blank	Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
NA	< 1.0	< 15	< 15	< 15	< 15	< 2.0	< 2.0	< 2.0

Method Blank	C-1,2-DCEE	1,1,1-TCE	1,1-DCP	TCM	1,2-DCE	TCE	DBM	1,1,2-TCE
	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Method Blank	1,3-DCP	TCEE	1,1,1,2-TCE	1,1,2,2-TCE	1,2,3-TCP	1,2-D-3-CP	HCB	
	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	
NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	

Lab. Control Sample	Ben	Tol	EtB	m,p-Xyl	o-Xyl	1,1-DCEE	T-1,2-DCEE	1,1-DCE
QC	85	82	112	107	116	108	95	94
Acceptance Criteria	100 ± 25 %							

Lab. Control Sample	C-1,2-DCEE	1,1,1-TCE	1,1-DCP	TCM	1,2-DCE	TCE	DBM	1,1,2-TCE
QC	91	106	115	105	79	88	81	99
Acceptance Criteria	100 ± 25 %							

Lab. Control Sample	1,3-DCP	TCEE	1,1,1,2-TCE	1,1,2,2-TCE	1,2,3-TCP	1,2-D-3-CP	HCB	
QC	92	121	117	122	95	85	114	
Acceptance Criteria	100 ± 25 %							

***Appendix F***  
***(Groundwater Risk Assessment Results)***

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Risk-Based Assessment for Groundwater Remediation for South Apron Area of Former Kai Tak Airport (Radar Station)

Table 1 - Source Concentrations & Oral Slope Factor/Oral Reference Dose for Risk Assessment

Parameter	Source Concentration	Sample I.D.	Noncarcinogenic Oral Reference Dose <sup>a</sup> (RfDo)	Minimum Noncarcinogenic Oral Reference Dose <sup>a</sup> (RfDo)	Carcinogenic Oral Slope Factor <sup>b</sup> (CSFo)
	[mg/L]		[mg/kg-day]	[mg/kg-day]	1/[mg/kg-day]
TPHs	2.87E+00	RSB-01	3.00E-02 to 5.00E+00	3.00E-02	Not applicable
Barium	6.40E-01	RSB-08	7.00E-02	Not applicable	Not applicable
Cadmium	3.80E-03	RSB-01A	5.00E-04	Not applicable	Not applicable
Copper	9.20E-02	RSB-01A	4.00E-02	Not applicable	Not applicable
Lead	1.60E+00	RSB-01	3.60E-03	Not applicable	Not applicable
Zinc	7.00E-01	RSB-01	3.00E-01	Not applicable	Not applicable
Phenanthrene	2.30E-03	RSB-08	4.00E-02	Not applicable	Not applicable
Xylenes	3.00E-02	All**	2.00E-01	Not applicable	Not applicable

<sup>a</sup> Source for TPHs : TPH Criteria Working Group, 1999. *Total Petroleum Hydrocarbons Criteria Working Group Series Volume 5 – Human Health Risk-Based Evaluation of Petroleum Release Sites: Implementing the Working Group Approach*. Massachusetts. U.S.A., Annherst Scientific Publishers.  
Source for Ba, Cd, Co, Cu, Zn, Phenanthrene & Xylenes : USEPA Region IX Risk-based Concentration Table (revised on Oct 04), USEPA Region IX.  
Source for Pb: The value is referenced to the tolerable daily intake (TDI) from the National Institute of Public Health and the Environment (RIVM), The Netherlands, 2001.  
<sup>b</sup> Source for TPHs, Ba, Cd, Co, Cu, Pb, Zn, Phenanthrene, Xylenes: USEPA Region IX Risk-based Concentration Table (revised on Oct 04), USEPA Region IX.  
# RfDo is not available for benzo(a)pyrene. With reference to the RIVM report - Re-evaluation of human-toxicological maximum permissible risk levels (March 2001) by National Institute of Public Health and the Environment, tolerable daily intake (TDI) for PAHs considered to be non-carcinogenic is 30ug/kg/day for aromatic compounds with equivalent carbon numbers of >16-35. In this assessment 30ug/kg/day takes as the non-carcinogenic oral dose for B(a)P.  
\*\* All sampling locations showed the same concentrations for Xylenes (i.e. 30ug/L as the Dutch B level).

Assumptions:

Exposure Pathway:

The applicable and dominant complete pathway is considered to be direct groundwater ingestion.

Receptor:

The most sensitive receptors are considered to be the construction workers.

Input Parameters for Calculations (for Direct Groundwater Ingestion):

IR = water ingestion rate [L/day] = 0.02 (The assumed water ingestion rate of 0.02 L/d is two orders of magnitude lower than the USEPA default drinking water rate of 2 L/day for adults. In addition, the 0.02 L/d water ingestion rate was adopted for many groundwater risk assessment in previous land contamination studies, such as South East Kowloon Development Infrastructure at North Apron Area of Kai Tak Airport; Reclamation Works for DOS&GIC Facilities in North Tsing Yi and Decommissioning of Cheoy Lee Shipyard at Penny's Bay EIA Study. As a result, the assumed water ingestion rate of 0.02L/d is adequate for groundwater risk assessment.)

EF = exposure frequency [day/yr] = 180 (assume construction workers expose for 6 months of site formation works)

ED = exposure duration [yr] = 1

BW = body weight [kg] = 70

AT = Averaging time [day] = 365 (for non-carcinogens: ED x 365 days)  
25550 (for carcinogens: 70 yrs x 365 days)

Table 2 - Calculations for Direct Groundwater Ingestion

Calculations	TPHs	Barium	Cadmium	Copper	Lead	Zinc	Phenanthrene	Xylenes
1. Groundwater conc. [mg/L] =	2.87E+00	6.40E-01	3.80E-03	9.20E-02	1.60E+00	7.00E-01	2.30E-03	3.00E-02
2. Natural attenuation factor =	1	1	1	1	1	1	1	1
3. Exposure medium [mg/L] = (1) / (2) =	2.87E+00	6.40E-01	3.80E-03	9.20E-02	1.60E+00	7.00E-01	2.30E-03	3.00E-02
4. Exposure multiplier [L/kg/day] = (IR x EF x ED) / (BW x AT) =	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04	1.41E-04
5. Average Daily Intake Rate [mg/kg/day] = (3) x (4) =	4.05E-04	9.02E-05	5.35E-07	1.30E-05	2.25E-04	9.86E-05	3.24E-07	4.23E-06
6. Maximum Pathway Intake [mg/kg/day] = (groundwater ingestion as dominant pathway)	4.05E-04	9.02E-05	5.35E-07	1.30E-05	2.25E-04	9.86E-05	3.24E-07	4.23E-06
7. Maximum Toxicant Intake Rate [mg/kg/day] =	4.05E-04	9.02E-05	5.35E-07	1.30E-05	2.25E-04	9.86E-05	3.24E-07	4.23E-06
8. Noncarcinogenic Oral Reference Dose [mg/kg-day] =	3.00E-02	7.00E-02	5.00E-04	4.00E-02	3.60E-03	3.00E-01	4.00E-02	2.00E-01
9. Individual Chemical of Concern Hazard Index = (7) / (8) =	1.35E-02	1.29E-03	1.07E-03	3.24E-04	6.26E-02	3.29E-04	8.10E-06	2.11E-05
10. Maximum Carcinogenic Intake Rate [mg/kg/day] =								
11. Carcinogenic Oral Slope Factor (1/[mg/kg-day]) =								
12. Individual Chemical of Concern (COC) Risk = (10) x (11) =								
<b>Total pathway hazard index =</b> (< 1 (USEPA recommended hazard index))								
(after adding contributions from all chemical of concern)								
<b>Total pathway carcinogenic risk =</b> Nil (< 1.00E-06 (USEPA lifetime cancer risk level)) (contributed by Bezo(a)Pyrene and Benzene)								
	TPHs	Barium	Cadmium	Copper	Lead	Zinc	Phenanthrene	Xylenes
RBSL [mg/L] = Min. of (Groundwater Conc./ Hazard Quotient) or (Groundwater Conc. x Cancer Risk / Risk of Contaminant) = Minimum of								
	2.13E+02	4.97E+02	3.55E+00	2.84E+02	2.56E+01	2.13E+03	2.84E+02	1.42E+03
	>>	>>	>>	>>	>>	>>	>>	>>
Groundwater conc. [mg/L] =	2.87E+00 (in mg/L)	6.40E-01 (in mg/L)	3.80E-03 (in mg/L)	9.20E-02 (in mg/L)	1.60E+00 (in mg/L)	7.00E-01 (in mg/L)	2.30E-03 (in mg/L)	3.00E-02 (in mg/L)
Risk	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable