JOB NO.: TCS00862/17

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

CONTAMINATION ASSESSMENT REPORT (CAR)

PREPARED FOR

CHINA GEO-ENGINEERING CORPORATION

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EXECUTIVE SUMMARY

INTRODUCTION

ES.01 **China Geo-Engineering Corporation** (hereinafter 'the Main Contractor') has been awarded CEDD Contract CV/2016/08 – Queen's Hill Development - Sewage Pumping Station Works (the Project) in January 2017. The Project is part of the proposed Infrastructural Works for Proposed Developments at Queen's Hill (QH), Fanling. The purpose of the Project is to construct and operate a sewage pumping station at Lung Ma Road to cope with sewerage needs of the planned developments at Queen's Hill development site (QHD).

ES.02 According to Condition 2.1 of the Environmental Permit No. EP-506/2016, land contamination assessment to the two concerned sites (CLP's substation and suspected car park workshop near Ma Liu Shiu Shan Tsuen at Queen's Hill) shall be carried out when access to the sites is available and before the commencement of construction of the Project.

ES.03 The Main Contractor appointed Action-United Environmental Services & Consulting (hereinafter referred to "AUES") as the Land Contamination Specialist to carry out land contamination assessment including relevant report submission and supervise site investigation. Furthermore, ALS Technichem (HK) Pty Ltd of HOKLAS laboratory was responsible to conduct chemical analysis.

FIELD WORK

ES.04 Site investigation work of the soil and groundwater sampling were conducted in period from 24 April 2017 to 26 May 2017 in accordance with the approved CAP.

ES.05 A total of eight (8) designated sampling points were located within the subject site at Substation and suspected Carpark/workshop for soil sample collection. Pit excavation and borehole drilling were used for soil sampling and a total of twenty-six (26) soil samples including two duplicate samples were collected. Two equipment blanks, two field blanks and eight trip blanks were also collected in the course of soil sampling for QA/QC control. Moreover, photo-ionization detection (PID) was also used for initial screening to check the soil sample vapor concentrations at the site.

ES.06 A total of five (5) monitoring wells were installed within the subject site and a total of six (6) groundwater samples including one groundwater samples duplicate were collected. One trip blank, one equipment blank and one field blank were collected in the course of groundwater sampling for QA/QC control. Prior of sampling, purging and in-situ measurements including temperature, pH and electrical conductivity were also taken in accordance with the approved CAP.

ES.07 No Non-Aqueous Phase Liquid (NAPL) was observed in the course of soil and groundwater sampling. All the soil and groundwater samples were delivered to ALS Technichem (HK) Pty Ltd to carry out chemical analysis in accordance with the approved CAP.

ANALYTICAL RESULT

ES.08 No exceedance of the criteria of RBRG, Soil Saturation Limit and Solubility Limit was found according to the chemicals testing results of the soil and groundwater samples

ES.09 Overall most of analytical results of soil and groundwater duplicate meet the RPD acceptable criteria. Moreover, most of the QA/QC samples such as trip blank, field blank and equipment blank were detected below reporting limits. According to QA/QC results shown that the chemical testing results are acceptable and reliable.

CONCLUSION

ES.10 Chemicals results of all soil and groundwater samples (original and duplicate samples) are well below the RBRGs, Soil Saturation Limit and Solubility Limit of remediation criteria. It is concluded that remediation of the subject site is not required.

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1 INTRODUCTION

PROJECT BACKGROUND

1.1 **China Geo-Engineering Corporation** (hereinafter 'the Main Contractor') has been awarded CEDD Contract CV/2016/08 – Queen's Hill Development - Sewage Pumping Station Works (the Project) in January 2017. The Project is part of the proposed Infrastructural Works for Proposed Developments at Queen's Hill (QH), Fanling. The purpose of the Project is to construct and operate a sewage pumping station at Lung Ma Road to cope with sewerage needs of the planned developments at Queen's Hill development site (QHD).

1.2 The Project site is located near Ma Liu Shui San Tsuen at Queen's Hill, which is currently occupied by few scattered village houses. It is located within "Government, Institution or Community" (G/IC) zone on the Lung Yeuk Tau & Kwan Tei South Outline Zoning Plan (OZP) No. S/NE-LYT/16. The site area is approximately 1,500 m^2. Location of the Project is enclosed in ***Appendix A***. Designated potential contamination area are shown in ***Appendix B***.

1.3 Since the proposed Queen's Hill Sewage Pumping Station (QHSPS) will have an installed capacity of more than 2000 m3 per day and the clearance between the existing/planned residential area and planned education institution will be less than 150m, it is classified as Designated Project under F.3(b) of Part I, Schedule 2 of Environmental Impact Assessment Ordinance (EIAO).

1.4 The Main Contractor appointed Action-United Environmental Services & Consulting (hereinafter referred to "AUES") as the Land Contamination Specialist to carry out land contamination assessment including relevant report submission and supervise site investigation. Furthermore, ALS Technichem (HK) Pty Ltd of HOKLAS laboratory was responsible to conduct chemical analysis.

1.5 According to Condition 2.1 of the Environmental Permit No. EP-506/2016, land contamination assessment to the two concerned sites (CLP's substation and suspected car park workshop near Ma Liu Shiu Shan Tsuen at Queen's Hill) shall be carried out when access to the sites is available and before the commencement of construction of the Project. A draft Contamination Assessment Plan (CAP) was developed and submitted to EPD on 3 Mar 2017, 10 Apr 2017 and 22 Apr 2017. EPD stated in email dated 26 Apr 2017 that they had no further comments on the draft CAP submitted on 22 Apr 2017. The CAP was formally submitted by the Proponent on 26 Apr 2017, and EPD's approval was given on 2 Jun 2017. Upon no further comments received from EPD, site investigation work was commenced by the Main Contractor.

1.6 For site investigation, soil sampling was conducted from 24 April to 16 May 2017. Moreover, groundwater sampling was conducted on 26 May 2017. Total 26 representative soil samples (include 2 duplicate samples) and 6 groundwater samples (include the duplicate sample) were collected and delivered to a HOKLAS-accredited laboratory carry out chemical analysis in accordance with the approved CAP. This Contamination Assessment Report (CAR) presents the results of the subject site investigation.

REPORT STRUCTURE

1.7 The Land Contamination Assessment Report (CAR) is structured into the following sections:-

Section 1 Introduction

Section 2 *Sampling Locations and* Assessment Methodology

Section 3 Assessment Results

Section 4 Conclusions and Recommendation

2 SAMPLING LOCATIONS AND ASSESSMENT METHODOLOGY

PROPOSED SAMPLING LOCATIONS

2.1 The site investigation was carried out between 24 April 2017 and 26 May 2017. According to the approved CAP, total eight (8) designated sampling points are located within the subject site for soil sample collection. Since groundwater was encountered at sampling pits at suspected carpark/workshop, groundwater samples was collected from the five (5) designated sampling pits at the suspected Carpark/Workshop for the assessment.

2.2 During the soil sampling, the original sampling location SPS-02-5 was blocked by cars parked at the suspected carpark/workshop which sampling work cannot be carried out and needed to be relocated to less than two meters north from the original location. Since the original sampling location SPS-02-5 was proposed by using square grid 13 meters and the actual sampling location SPS-02-5 is located at the same grid of the original sampling location SPS-02-5, the actual sampling location SPS-02-5 is as representative as the original sampling location SPS-02-5. The location of the sampling points is presented in ***Table 2-1*** and are shown in ***Appendix C*** with photograph records**.**

CHEMICAL ANALYSIS

2.3 The chemical analysis for the soil and groundwater samples from the substation and suspected carpark/workshop were done according to the approved CAP. The proposed chemical analysis is presented in ***Table 2-1.***

SOIL SAMPLING METHODOLOGY

2.4 Site investigation of soil sampling included pit excavation and borehole drilling are used. During soil sampling process, staff of AUES was full time on site for monitoring and supervision to confirm no cross contamination or any other forms of interferences occur. All the collected soil samples were put into glass jar provided by the HOKLAS laboratory and stored in a cool box maintained at a temperature of 4℃ without being frozen.

2.5 During soil sampling, vapor concentrations measurement using photo-ionization detection (PID) were also conducted by the Land Contamination Specialist and is presented in ***Table 2-2***. Moreover, trial pit records and drillhole records showing the soil strata, actual depth of samples collected and description of soil condition were attached in Appendix I.

Pit Excavation Perform Soil Sampling

2.6 For the soil sampling at the substation, soil samples were collected at the proposed sampling location by pit excavation at 0.5m, 1.5m and 3.0m below ground level. For the soil sampling at the suspected carpark/workshop, soil samples were collected at the proposed sampling locations by pit excavation at 0.5m and the pit excavation was done from ground surface to 1.2m below ground level (bgl) by hand digging at all designated sampling points to ensure there is no subsurface underground utilities before carrying out borehole drilling for soil sampling.

Borehole Drilling Perform Soil Sampling

2.7 A drilling rig was used for borehole drilling to perform soil sampling at the suspected carpark/workshop and allow standpipes installation for the groundwater wells set up after soil sampling. The drilling of boreholes started from 1.2m bgl and soil samples was taken in vertical profiles and collected at the specified depths. According to the sampling depths proposal, soil sampling using drilling rig were performed at depth 1.5m and 4.5m below ground level at each sampling location at the suspected carpark/workshop. No extra sampling point and sample is added in the subject assessment site.

In-Situ Measurements

2.8 Total 26 soil samples which included 2 duplicate samples were collected from eight (8) designated sampling points. Soil samples were inspected for any visual and olfactory signs of contamination. Moreover, photo-ionization detection (PID) was also used for initial screening to check the soil sample vapor concentrations at the site. The PID was pre-calibrated using isobutylene standard reference gas to ensure the accuracy of the equipment. Since there is no visual and olfactory signs of contamination observed from the soil samples during sampling and the PID measurement readings of the soil samples are very low, sampling at further depths are considered not necessary.

Table 2-1 Summarize of the As-built Sampling Points at the Two Potential Contamination Areas

Potential Contamination Area	Sampling Point ID	Co-ordinates		Location of Sampling Point	Proposed Sampling Depth	Termination Depth	Chemicals of Concern (COCs)
		Easting	Northing				
CLP Substation	SPS-01-1	833 945	840760	Open area at West of the Switch Panel Room	Below ground level 0.5m, 1.5m and 3.0m	Below ground level 3.0m	**Metals** – Arsenic, Cadmium, Chromium III & VI, Mercury and Nickel **Petroleum Carbon Ranges** – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35 **Volatile Organic Compounds** (VOCs) – Benzene, Toluene, Ethylbenzene and Xylenes (Total). **Semi-volatile Organic Compounds (SVOCs)** – Phenol and Naphthalene. **Polychlorinated Biphenyls (PCBs)**
	SPS-01-2	833 945	840 766	Open area at Southwest of the Switch Panel Room	Below ground level 0.5m, 1.5m and 3.0m	Below ground level 3.0m	
	SPS-01-3	833 953	840 763	Open area near the site entrance	Below ground level 0.5m, 1.5m and 3.0m	Below ground level 3.0m	

Potential Contamination Area	Sampling Point ID	Co-ordinates		Location of Sampling Point	Proposed Sampling Depth	Termination Depth	Chemicals of Concern (COCs)
		Easting	Northing				
Suspected Car Park/ Workshop	SPS-02-1	834 004	840 741	General refuse storage area	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m	**Metals** – Antimony, Arsenic, Barium, Cadmium, Chromium III & VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc **Petroleum Carbon Ranges** – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35 **Volatile Organic Compounds (VOCs)** – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene; **Semi-volatile Organic Compounds (SVOCs)**– Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene and Pyrene. **Polychlorinated Biphenyls (PCBs)**
	SPS-02-2	834 013	840 740	Lube oil empty bottles temporary storage location	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m	
	SPS-02-3	834 012	840 729	Southern part of the site	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m	
	SPS-02-4	834 004	840 733	Near the entrance of the site	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m	
	SPS-02-5 Original	834 019	840 725	Southeast corner of the site	Below ground level 0.5m, 1.5m and 4.5m	Below ground level 4.5m	
	SPS-02-5 Actual	834 019	840 726				

Table 2-2 PID Measurement results of Soil Samples

Sampling Point	Depth (m bgl)	PID Reading (ppm)		
		Initial	Measure	Actual
SPS-01-1	0.5	0.1	1.3	1.2
	1.5	0.0	2.3	2.3
	3.0	0.1	2.1	2.0
SPS-01-2	0.5	0.0	1.4	1.4
	1.5	0.1	0.9	0.8
	3.0	0.0	1.7	1.7
SPS-01-3	0.5	0.1	2.3	2.2
	1.5	0.0	1.4	1.4
	3.0	0.0	2.9	2.9
SPS-02-1	0.5	0.0	1.5	1.5
	1.5	0.1	1.9	1.8
	4.5	0.0	1.1	1.1
SPS-02-2	0.5	0.1	0.7	0.6
	1.5	0.0	1.0	1.0
	4.5	0.1	0.8	0.7
SPS-02-3	0.5	0.0	1.3	1.3
	1.5	0.0	1.8	1.8
	4.5	0.0	2.5	2.5
SPS-02-4	0.5	0.1	1.9	1.8
	1.5	0.1	1.6	1.5
	4.5	0.0	2.0	2.0
SPS-02-5	0.5	0.1	0.6	0.5
	1.5	0.0	1.1	1.1
	4.5	0.0	1.2	1.2

2.9 The two duplicate samples Duplicate Sample 1 and Duplicate Sample 2 split respectively from samples SPS-01-3/1.5m bgl and SPS-02-2/0.5m bgl were collected for quality control. All soil samples included the duplicate samples were delivered to a local HOKLAS-accredited laboratory (ALS Technichem (HK) Pty Ltd) and were carried out chemicals analysis in accordance with the approved CAP. Chemicals analysis of the Testing Method and Reporting limit are shown ***Table 2-3***.

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

Parameter	Methods	Reporting Limit (mg/kg)
a) Metals	USEPA 6020	
• Antimony		1
• Arsenic		1
• Barium		1
• Cadmium		0.2
• Chromium III & VI		1
• Cobalt		1
• Copper		1
• Lead		1
• Manganese		1
• Mercury		0.2
• Molybdenum		1
• Nickel		1
• Tin		1
• Zinc		1
b) Petroleum Carbon Ranges	USEPA 8015	
• C6 – C8		5
• C9 – C16		200
• C17 – C35		500
c) Volatile Organic Compounds (VOCs)	USEPA 8260	
• Acetone		50
• Benzene		0.2
• Toluene		0.5
• Ethylbenzene		0.5
• Xylenes (total)		2
• Methyl tert-Butyl Ether		0.5
• Trichloroethene		0.1
d) Semi-volatile Organic Compounds (SVOCs)	USEPA 8270	
• Acenaphthene		0.5
• Acenaphthylene		0.5
• Anthracene		0.5
• Benzo(a)anthracene		0.5
• Benzo(a)pyrene		0.5
• Benzo(b)fluoranthene		0.5
• Benzo(g,h,i)perylene		0.5
• Benzo(k)fluoranthene		0.5
• Chrysene		0.5
• Dibenzo(a,h)anthracene		0.5
• Fluoranthene		0.5
• Fluorene		0.5
• Indeno(1,2,3-cd)pyrene		0.5
• Naphthalene		0.5
• Phenanthrene		0.5
• Phenol		0.5
• Pyrene		0.5
e) Polychlorinated Biphenyls (PCBs)	USEPA8270	0.1

GROUNDWATER SAMPLING LOCATIONS

2.10 According to the approved CAP, if groundwater is encountered at sampling pits, groundwater samples will be collected for the assessment. Since groundwater was encountered during soil sampling at the suspected carpark/workshop, groundwater monitoring wells are installed at sampling pits SPS-02-1, SPS-02-2, SPS-02-3, SPS-02-4 and SPS-02-5. No groundwater monitoring well was installed at the substation due to no groundwater was encountered and detected at the final depth of soil sampling work at sampling pits SPS-01-1, SPS-01-2 and SPS-01-3.

2.11 The locations of the five monitoring wells are detailed in ***Table 2-4*** and the graphical with photograph is shown ***Appendix D***.

Table 2-4 Monitoring Well Locations and Detail information

Groundwater Well ID	Relate Soil Borehole	Coordinates		Groundwater Level Detected (m bgl)	Date of Installation	Well Depth (m)
		Easting	Northing			
SPS-02-1	SPS-02-1	834 004	840 741	2.71	9 May 2017	4.41
SPS-02-2	SPS-02-2	834 013	840 740	2.78	10 May 2017	4.38
SPS-02-3	SPS-02-3	834 012	840 729	2.86	11 May 2017	4.46
SPS-02-4	SPS-02-4	834 004	840 733	2.84	9 May 2017	4.55
SPS-02-5	SPS-02-5	834 019	840 726	2.74	16 May 2017	4.34

MONITORING WELL INSTALLATION AND CONSTRUCTION

2.12 The groundwater wells installation were carried out after finished soil sampling at the related sampling points. Furthermore, the water levels measurement were undertaken about an hour after the drilling work completion.

2.13 The casing for the construction of monitoring wells was a minimum of 105mm in diameter and 50 mm diameter with 0.5 mm slot aperture PVC pipes were used for groundwater well installation. No solvent welding was employed for all joints made.

2.14 The well screening slot was installed between one meter above the water table and 250-300mm above bottom of the drill hole. The bottom end of the casing was fitted with an end-cap to avoid surge up materials entering the wells.

2.15 1mm in size of clean sand as filter material is used to surround the slotted casing, and was filling from bottom of the drill hole to at least 0.5m above end of the screen. Additional, a minimum of 0.5m thickness pellet bentonite was placed on clean sand layer surface. Above a bentonite pellet layer, grout comprising a mixture of cement and bentonite and tap water was used to seal the bore below the ground surface at a minimum of 400mm. All wells were completed with concrete from 200mm - 300mm below ground levels to about 10mm above the ground surface. The wellheads are formed of steel manhole cover. All wellheads were marked with unique monitoring well numbers. Detailed information of the monitoring well construction is presented in ***Appendix E.***

GROUNDWATER SAMPLING METHODOLOGY

2.16 After water monitor well installation completed, cleaning of the monitoring wells was carried out to remove silt and drilling fluid residue. Before groundwater sampling carry out, the monitor wells were developed and purged in accordance with the approved CAP.

Groundwater Gauging

2.17 Groundwater level at each monitoring well was measured during the completed installation of the well and before purging and sampling. No trace of free product at the wells was observed during the time of measurement. Moreover, well headspace vapour concentrations was not detected. The groundwater levels measured on the top of PVC pipe are presented in ***Table 2-5***.

Table 2-5 Groundwater Level Measurement Records

Measurement Time	Depth below the existing ground level (m)				
	SPS-02-1	SPS-02-2	SPS-02-3	SPS-02-4	SPS-02-5
One hour after drilling work completion	2.71	2.78	2.86	2.84	2.74
Before purging of monitoring wells	2.91	2.98	2.96	3.04	3.05
Before conduct groundwater sampling	3.58	3.47	3.56	3.40	3.24
After completed groundwater sampling	3.62	3.57	3.66	3.43	3.61

Groundwater Flow Direction

2.18 Besides the groundwater measurement, the groundwater flow direction was determined by the relative groundwater level of each well. The relative groundwater level of each well was obtained based on the surveyed relative levels of each monitoring wells tops obtained from the Contractor and the groundwater level measured on site**.** ***Table 2-6*** shows the relative groundwater level of each well.

Table 2-6 Relative groundwater levels of each monitoring well

	SPS-02-1	**SPS-02-2**	**SPS-02-3**	**SPS-02-4**	**SPS-02-5**
Relative levels of each monitoring wells tops (**SPS-02-1** as reference point)	0m	+0.43m	+0.46 m	+0.17 m	+0.48m
Groundwater level before conduct groundwater sampling (Depth below the existing ground level (m)	3.58m	3.47m	3.56m	3.40m	3.24m
Relative groundwater level (Depth below the existing ground level)	3.58m	3.03m	3.10m	3.23m	2.76m

2.19 Based on the relative groundwater level of each monitoring well, the groundwater at the assessment site is likely flows from Northwest to Southeast of the assessment site. The determined groundwater flow direction was shown in ***Appendix D***.

Groundwater Sampling

2.20 The groundwater sampling was undertaken on 26 May 2017. Prior of sampling, purging and in-situ measurements including temperature, pH and electrical conductivity were also taken in accordance with the approved CAP. In addition, measurement of Non-Aqueous Phase Liquid (NAPL) at each monitoring well were also carried out by using oil/water interface meter prior water sampling and no NAPL was detected at all the monitoring wells. In-situ measurement record and field record for the NAPL measurement is shown in ***Appendix F.***

2.21 The purging and sampling activities were undertaken between groundwater surface and one meter below the water levels using a teflon bailer. Purging of groundwater was carried out at each monitoring well until stabilized in-situ measurements were attained.

2.22 A total of six groundwater samples (include one duplicate sample) were collected from the five monitoring wells. All groundwater samples plus two QA/QC samples (field blank and trip blank) were delivered to the laboratory on the following day of sampling. The duplicate sample was collected from a split sample from SPS-02-1 for quality control. All groundwater samples collected are preserved same as soil samples manner. All laboratory QA/QC and chain of custody procedures have had properly followed.

2.23 After completion of water sampling, all the groundwater samples were immediately delivered to laboratory on the same day.

2.24 Since no groundwater well were installed at sampling points SPS-01-1, SPS-01-2 and SPS-01-3 at the CLP Substation, these sampling point were backfilled with sand reinstate after soil sampling.

GROUNDWATER SAMPLE ANALYSIS

2.25 All groundwater samples were analyzed in accordance with the approved CAP. The testing parameters are listed in ***Table 2-7.*** As per the "Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management" requirements, all chemical analysis methods used for groundwater assessment are accredited by the Hong Kong Laboratory Accreditation Scheme (HOKLAS).

Table 2-7 Chemical Analysis of Groundwater for Land Contamination Assessment

Parameter	Methods	Reporting Limit (µg/L)
a) Petroleum Carbon Ranges	USEPA 8015	
• C6 – C8		20
• C9 – C16		500
• C17 – C35		500
b) Volatile Organic Compounds (VOCs)	USEPA 8260	
• Acetone		500
• Benzene		5
• Toluene		5
• Ethylbenzene		5
• Xylenes (total)		20
• Methyl tert-Butyl Ether		5
• Trichloroethene		5
c) Semi-volatile Organic Compounds (SVOCs)	USEPA 8270	
• Acenaphthene		2
• Acenaphthylene		2
• Anthracene		2
• Benzo(b)fluoranthene		1
• Chrysene		1
• Fluoranthene		2
• Fluorene		2
• Naphthalene		2
• Phenanthrene		2
• Pyrene		2
d) Polychlorinated Biphenyls (PCBs)	USEPA8270	1
e) Metals		
• Mercury	USEPA 6020	0.5

ASSESSMENT GUIDELINES

2.26 Since the land use of the subject site in future will be a sewage pumping station, therefore soil and groundwater samples are evaluated the industrial of Risk-based Remediation Goals limits and are listed in ***Table 2-8***.

Table 2-8 Risk-based Remediation Goals for Soil and Groundwater

Parameter		Soil		Groundwater	
		Industrial (mg/kg)	Soil Saturation Limit C_{sat} (mg/kg)	Industrial (mg/L)	Solubility Limit (mg/L)
Metals	Antimony (Sb)	2.61E+02	NA	NA	NA
	Arsenic (As)	1.96E+02	NA	NA	NA
	Barium (Ba)	1.00E+04*	NA	NA	NA
	Cadmium (Cd)	6.53E+02	NA	NA	NA
	Chromium III	1.00E+04*	NA	NA	NA
	Chromium VI	1.96E+03	NA	NA	NA
	Cobalt (Co)	1.00E+04*	NA	NA	NA
	Copper (Cu)	1.00E+04*	NA	NA	NA
	Lead (Pb)	2.29E+03	NA	NA	NA
	Manganese (Mn)	1.00E+04*	NA	NA	NA
	Mercury (Hg)	3.84E+01	NA	6.79E+00	NA
	Molybdenum (Mo)	3.26E+03	NA	NA	NA
	Nickel (Ni)	1.00E+04*	NA	NA	NA
	Tin (Sn)	1.00E+04*	Na	NA	NA
	Zinc (Zn)	1.00E+04*	NA	NA	NA

Parameter		Soil		Groundwater	
		Industrial (mg/kg)	Soil Saturation Limit C_{sat} (mg/kg)	Industrial (mg/L)	Solubility Limit (mg/L)
Petroleum Carbon Ranges	C6 – C8	1.00E+04*	1.00E+03	1.15E+03	5.23E+00
	C9 – C16	1.00E+04*	3.00E+03	9.98E+03	2.80E+00
	C17 – C35	1.00E+04*	5.00E+03	1.78E+02	2.80E+00
Volatile Organic Compounds (VOCs)	Acetone	1.00E+04*	***	1.00E+04*	***
	Benzene	9.21E+00	3.36E+02	5.40E+01	1.75E+03
	Toluene	1.00E+04*	2.35E+02	1.00E+04*	5.26E+02
	Ethylbenzene	8.24E+03	1.38E+02	1.00E+04*	1.69E+02
	Xylenes (total)	1.23E+03	1.50E+02	1.57E+03	1.75E+02
	Methyl tert-Butyl Ether	7.01E+01	2.38E+03	1.81E+03	***
	Trichloroethene	5.68E+00	4.88E+02	1.42E+01	1.10E+03
Semi-Volatile Organic Compounds (SVOCs)	Acenaphthene	1.00E+04*	6.02E+01	1.00E+04*	4.24E+00
	Acenaphthylene	1.00E+04*	1.98E+01	1.00E+04*	3.93E+00
	Anthracene	1.00E+04*	2.56E+00	1.00E+04*	4.34E-02
	Benzo(a)anthracene	9.18E+01	NA	NA	NA
	Benzo(a)pyrene	9.18E+00	NA	NA	NA
	Benzo(b)fluoranthene	1.78E+01	NA	7.53E+00	1.50E-03
	Benzo(g,h,i)perylene	1.00E+04*	NA	NA	NA
	Benzo(k)fluoranthene	9.18E+02	NA	NA	NA
	Chrysene	1.14E+03	NA	8.12E+02	1.60E-03
	Dibenzo(a,h)anthracene	9.18E+00	NA	NA	NA
	Fluoranthene	1.00E+04*	NA	1.00E+04*	2.06E-01
	Fluorene	1.00E+04*	5.47E+01	1.00E+04*	1.98E+00
	Indeno(1,2,3-cd)pyrene	9.18E+01	NA	NA	NA
	Naphthalene	4.53E+02	1.25E+02	8.62E+02	3.10E+01
	Phenanthrene	1.00E+04*	2.80E+01	1.00E+04*	1.00E+00
	Phenol	1.00E+04*	7.26E+03	NA	NA
	Pyrene	1.00E+04*	NA	1.00E+04*	1.35E-01
Polychlorinated Biphenyls (PCBs)		7.48E-01	NA	5.11E+00	3.10E-02

Remark:
(*) indicates a 'ceiling limit' concentration.
(***) indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies

QA/QC SAMPLING

2.27 The quality control samples collection is used to prove sampling performance. In accordance with the approved CAP requirements, two soil duplicate samples, two equipment blanks and trip blank per sampling days were collected in the course of soil sampling, and one water duplicate samples with one trip blank , one equipment blank and one field blank were collected in the course of groundwater sampling.

Trip Blank collection

2.28 The trip blank was prepared in the laboratory using organic-free water. The trip blank was brought to the site and remained to unopened from the start of groundwater sampling to the delivery of samples to the laboratory and analyzed with Volatile Organic Compounds (VOCs) listed in Table 2-3 and Table 2-7.

Field Blank Collection

2.29 The field blank was prepared in field using organic-free water by passing the water from a full bottle to an empty bottle at the most contaminated location on site. The field blank accompanied the project samples to the laboratory and analyzed with Volatile Organic Compounds (VOCs) listed in Table 2-3 and Table 2-7

Duplicate Sample Collection

2.30 The duplicate samples were collected as a split sample from soil and groundwater and analyzed equivalent to the original samples. These samples were delivered to the laboratory as two individual samples without any indication to the laboratory that they are duplicates.

PROCEDURE FOR DECONTAMINATING EQUIPMENT

2.31 All sampling equipment decontamination was used phosphate-free detergent (Decon® 90) with tap water and then distilled water to rinse according to the following procedures:

- All well installation materials were decontaminated prior to use to ensure no foreign material was introduced to newly-drilling borehole;
- All down-hole drilling equipment was decontaminated between drilling locations to ensure there was no cross contamination of soil, surface water or groundwater between boreholes;
- All sampling equipment was decontaminated between sampling locations to prevent cross-contamination of samples; and
- Drilling equipment was washed down prior to leaving site to prevent potentially contaminated soil, surface water or groundwater being transported off-site.

Equipment Blank collection

2.32 The equipment blank was prepared from assessment site by the sampling tools/equipment rinse to verify the decontamination procedures and background or ambient airborne contaminants on the site in the laboratory using organic-free water. It was analyzed with same chemical testing with the soil/groundwater samples collected.

3 ASSESSMENT RESULTS

3.1 Totally twenty-six (26) soil samples with two duplicate samples included, six (6) groundwater samples with one duplicate sample included plus QA/QC samples were delivered to the laboratory for the required chemical analysis. The assessment results were evaluated against Risk-based Remediation Goals limits as presented in ***Table 2-8*** of the report.

LABORATORY RESULTS OF SOIL SAMPLES

3.2 The details of compare maximum detected concentrations to RBRGs and C_{sat} trigger Criteria are presented in ***Table 3-1***. Full laboratory data report with Chain-of-Custody documents are shown in ***Appendix G***.

Table 3-1 Soil Data Summary and Comparison to RBRGs and C_{sat}

Chemical	Frequency of Detection (x/y)			Range of Detected Concentration (mg/kg)		RBRGs (mg/kg)		Maximum Detected Concentration Exceeds	
	X	Y	%	Min.	Max.	Industrial	C_{sat}	Industrial	C_{sat}
Heavy Metals									
Antimony	**4**	16	**25.0**	1	1	2.61E+02	--	NO	***NA***
Arsenic	**13**	26	**50.0**	2	45	1.96E+02	--	NO	***NA***
Barium	**16**	16	**100.0**	41	144	1.00E+04*	--	NO	***NA***
Cadmium	**3**	26	**11.5**	0.2	0.4	6.53E+02	--	NO	***NA***
Cobalt	**16**	16	**100.0**	2	6	1.00E+04*	--	NO	***NA***
Copper	**16**	16	**100.0**	2	39	1.00E+04*	--	NO	***NA***
Lead	**16**	16	**100.0**	26	152	2.29E+03	--	NO	***NA***
Manganese	**16**	16	**100.0**	32	342	1.00E+04*	--	NO	***NA***
Mercury	**15**	26	**57.6**	0.06	0.2	3.84E+01	--	NO	***NA***
Molybdenum	**12**	16	**75.0**	1	4	3.26E+03	--	NO	***NA***
Nickel	**26**	26	**100.0**	1	9	1.00E+04*	--	NO	***NA***
Tin	**16**	16	**100.0**	1	4	1.00E+04*	--	NO	***NA***
Zinc	**16**	16	**100.0**	24	343	1.00E+04*	--	NO	***NA***
Trivalent Chromium	**26**	26	**100.0**	3	21	1.00E+04*	--	NO	***NA***
Hexavalent Chromium	**0**	26	**0**	0	0	1.96E+03	--	NO	***NA***
Petroleum Carbon Ranges									
C6 - C8 Fraction	0	26	0.0	***BDL***		1.00E+04*	1.00E+03	NO	NO
C9 - C16 Fraction	0	26	0.0	***BDL***		1.00E+04*	3.00E+03	NO	NO
C17 - C35 Fraction	0	26	0.0	***BDL***		1.00E+04*	5.00E+03	NO	NO
Volatile Organic Compounds (VOCs)									
Acetone	0	16	0.0	***BDL***		1.00E+04*	***	NO	NO
Benzene	0	26	0.0	***BDL***		9.21E+00	3.36E+02	NO	NO
Toluene	0	26	0.0	***BDL***		1.00E+04*	2.35E+02	NO	NO
Ethylbenzene	0	26	0.0	***BDL***		8.24E+03	1.38E+02	NO	NO
Xylenes (total)	0	26	0.0	***BDL***		1.23E+03	1.50E+02	NO	NO
MTBE	0	16	0.0	***BDL***		7.01E+01	2.38E+03	NO	NO
Trichloroethene	0	16	0.0	***BDL***		5.68E+00	4.88E+02	NO	NO
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	0	16	0.0	***BDL***		1.00E+04*	6.02E+01	NO	NO
Acenaphthylene	0	16	0.0	***BDL***		1.00E+04*	1.98E+01	NO	NO
Anthracene	0	16	0.0	***BDL***		1.00E+04*	2.56E+00	NO	NO

Chemical	Frequency of Detection (x/y)			Range of Detected Concentration (mg/kg)		RBRGs (mg/kg)		Maximum Detected Concentration Exceeds	
	X	Y	%	Min.	Max.	Industrial	C_{sat}	Industrial	C_{sat}
Benzo(a)anthracene	0	16	0.0	***BDL***		9.18E+01	NA	NO	***NA***
Benzo(a)pyrene	0	16	0.0	***BDL***		9.18E+00	NA	NO	***NA***
Benzo(b)fluoranthene	0	16	0.0	***BDL***		1.78E+01	NA	NO	***NA***
Benzo(g,h,i)perylene	0	16	0.0	***BDL***		1.00E+04*	NA	NO	***NA***
Benzo(k)fluoranthene	0	16	0.0	***BDL***		9.18E+02	NA	NO	***NA***
Chrysene	0	16	0.0	***BDL***		1.14E+03	NA	NO	***NA***
Dibenzo(a,h)anthracene	0	16	0.0	***BDL***		9.18E+00	NA	NO	***NA***
Fluoranthene	0	16	0.0	***BDL***		1.00E+04*	NA	NO	***NA***
Fluorene	0	16	0.0	***BDL***		1.00E+04*	5.47E+01	NO	***NO***
Indeno(1,2,3-cd)pyrene	0	16	0.0	***BDL***		9.18E+01	NA	NO	***NA***
Naphthalene	0	26	0.0	***BDL***		4.53E+02	1.25E+02	NO	NO
Phenanthrene	0	16	0.0	***BDL***		1.00E+04*	2.80E+01	NO	NO
Phenol	0	10	0.0	***BDL***		1.00E+04*	7.26E+03	NO	NO
Pyrene	0	16	0.0	***BDL***		1.00E+04*	NA	NO	NA
Polychlorinated Biphenyls (PCBs)									
Total Polychlorinated Biphenyls	0	26	0.0	***BDL***		7.48E-01	NA	NO	NA

Remark:
(*) indicates a 'ceiling limit' concentration.
(***) indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies
x = number of samples were found above the reporting limit
y = number of samples analyzed for chemical
BDL = Below the Reporting Limit
NA = Non-Applicable

LABORATORY RESULTS OF WATER SAMPLES

3.3 The detailed of compared maximum detected concentrations to the RBRGs and Solubility Limit is presented in ***Table 3-2*** and the full laboratory data reports are shown in ***Appendix G***.

Table 3-2 Groundwater Data Summary and Comparison to RBRGs and Solubility Limit

Chemical	Frequency of Detection (x/y)			Range of Detected Concentration (µg/L)		RBRGs (mg/L)		Maximum Detected Concentration Exceeds	
	X	Y	%	Min.	Max.	Industrial	Solubility Limit	Industrial	Solubility Limit
Heavy Metals									
Mercury	**0**	**6**	**0**	***BDL***		6.79E+00	NA	NO	NO
Petroleum Carbon Range									
C6 - C8 Fraction	**0**	6	**0**	***BDL***		1.15E+03	5.23E+00	NO	NO
C9 - C16 Fraction	**0**	6	**0**	***BDL***		9.98E+03	2.80E+00	NO	NO
C17 - C35 Fraction	**3**	6	**50.0**	**600**	**1500**	1.78E+02	2.80E+00	NO	NO
Volatile Organic Compounds (VOCs)									
Acetone	0	6	0.0	***BDL***		1.00E+04*	***	NO	NO
Benzene	0	6	0.0	***BDL***		5.40E+01	1.75E+03	NO	NO
Toluene	0	6	0.0	***BDL***		1.00E+04*	5.26E+02	NO	NO
Ethylbenzene	0	6	0.0	***BDL***		1.00E+04*	1.69E+02	NO	NO
Xylenes (total)	0	6	0.0	***BDL***		1.57E+03	1.75E+02	NO	NO
MTBE	0	6	0.0	***BDL***		1.81E+03	***	NO	NO
Trichloroethene	0	6	0.0	***BDL***		1.42E+01	1.10E+03	NO	NO
Semi-Volatile Organic Compounds (SVOCs)									
Acenaphthene	0	6	0.0	***BDL***		1.00E+04*	4.24E+00	NO	NO
Acenaphthylene	0	6	0.0	***BDL***		1.00E+04*	3.93E+00	NO	NO
Anthracene	0	6	0.0	***BDL***		1.00E+04*	4.34E-02	NO	NO
Benzo(b)fluoranthene	0	6	0.0	***BDL***		7.53E+00	1.50E-03	NO	NO
Chrysene	0	6	0.0	***BDL***		8.12E+02	1.60E-03	NO	NO
Fluoranthene	0	6	0.0	***BDL***		1.00E+04*	2.06E-01	NO	NO
Fluorene	0	6	0.0	***BDL***		1.00E+04*	1.98E+00	NO	NO
Naphthalene	0	6	0.0	***BDL***		8.62E+02	3.10E+01	NO	NO
Phenanthrene	0	6	0.0	***BDL***		1.00E+04*	1.00E+00	NO	NO
pyrene	0	6	0.0	***BDL***		1.00E+04*	1.35E-01	NO	NO
Polychlorinated Biphenyls (PCBs)									
Total Polychlorinated Biphenyls	0	6	0.0	***BDL***		5.11E+00	3.10E-02	NO	NO

Remark:
(*) indicates a 'ceiling limit' concentration.
(***) indicates that the solubility limit exceeds the 'ceiling limit' therefore the RBRG applies
x = number of samples were found above the reporting limit
y = number of samples analyzed for chemical
BDL = Below the Reporting Limit
NA = Non-Applicable

DATA QUALITY

3.4 For the assessment, the QA/QC of soil and groundwater sampling was conducted in accordance with the Approved CAP. Two soil and one groundwater duplicate samples were obtained for full suite analysis. Also three equipment blanks and three field blank were sampled during the soil and groundwater sampling process. The analysis for equipment blanks to be tested same chemical analysis with the soil and groundwater samples; trip blank and field blank were tested with VOCs listed in Table 2-3 and Table 2-7.

Type of Sample	Original Sample	Duplicate Sample ID
Soil	SPS-01-3/ 1.5m bgl	Duplicate Sample 1
Soil	SPS-02-2/ 0.5m bgl	Duplicate Sample 2
Water	SPS-02-1	Duplicate

3.5 The Relative Percent Difference (RPD) of the field QA/QC for soil and groundwater sample is listed in ***Table 3-3*****.** The RPD acceptance criteria are revised where the analytical results are less than 10 times of the limit of reporting for a particular analysis.

Table 3-3 Acceptance Criteria for Field Quality Control Samples

Quality Control Samples	Acceptable Relative Percent Difference (RPD)/Results
Trip Blanks	Result = Non Detectable
Field Blanks	Result = Non Detectable
Equipment Blanks	Result = Non Detectable
Blind Duplicates	RPD = 0% to 30% of mean concentration determined by both tests

$$\textbf{The Relative Percent Difference (RPD)} = \frac{(\text{Result 1} - \text{Result 2}) \times 100}{\text{Mean of Results 1 \& 2}}$$

3.6 ***Appendix H*** is shown a comparison of RPD values among the soil and groundwater duplicates.

3.7 Most of the chemicals analytical results for the duplicate samples and original samples are below the reporting limits, were within the acceptable percentage of RPD and were consistent with the original soil sample. Although there are three detected chemical analysis parameters for soil duplicate samples exceeded the acceptable percentage of RPD, overall the chemicals analysis for soil duplicate samples are well performed and the chemical testing results are concluded acceptable.

3.8 Most of the trip blanks, field blanks and equipment blanks results are below reporting limits. However, Zinc was detected in one of the soil equipment blanks. Since the detected Zinc concentration is very low (26 ug/L), the influence from the equipment used to the soil sample is minimal. The chemical testing results are concluded acceptable and reliable.

3.9 According to ***Table 3-1*** and ***Table 3-2***, chemicals results of all soil and groundwater samples (original and duplicate samples) are well below the RBRGs, Soil Saturation Limit and Solubility Limit of remediation criteria. Hence, remediation of the subject site is not required.

4 CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

4.1 Site investigation work of the soil and groundwater sampling were conducted in period from 24 April to 26 May 2017 in accordance with the approved CAP. As mentioned in the approved CAP, this land contamination assessment only covered part of the concerned sites which fall within the site boundary of the Sewage Pumping Station Works. The concerned site areas outside the site boundary under this Project (the orange areas in the in the **Appendices B, C and D**) are out of the allocated area of this project and are not covered in this land contamination assessment. If these area are required for other future projects by other parties, it will be their responsibility to carry out the land contamination assessment at the areas.

4.2 Total twenty-six (26) soil and six (6) groundwater samples (included two soil and one groundwater samples duplicate), were collected and delivered to ALS Technichem (HK) Pty Ltd for chemical analysis in accordance with the approved CAP.

4.3 Before groundwater sampling, in-situ measurement including temperature, pH and electrical conductivity was performed to ensure the collected groundwater was stable. Extra samples including field blank, trip blank and equipment blanks, were collected for QA/QC control.

4.4 Overall most of analytical results of soil and groundwater duplicate meet the RPD acceptable criteria. Moreover, most of the QA/QC samples such as trip blank, field blank and equipment blank were detected below reporting limits. According to QA/QC results shown that the chemical testing results are acceptable and reliable.

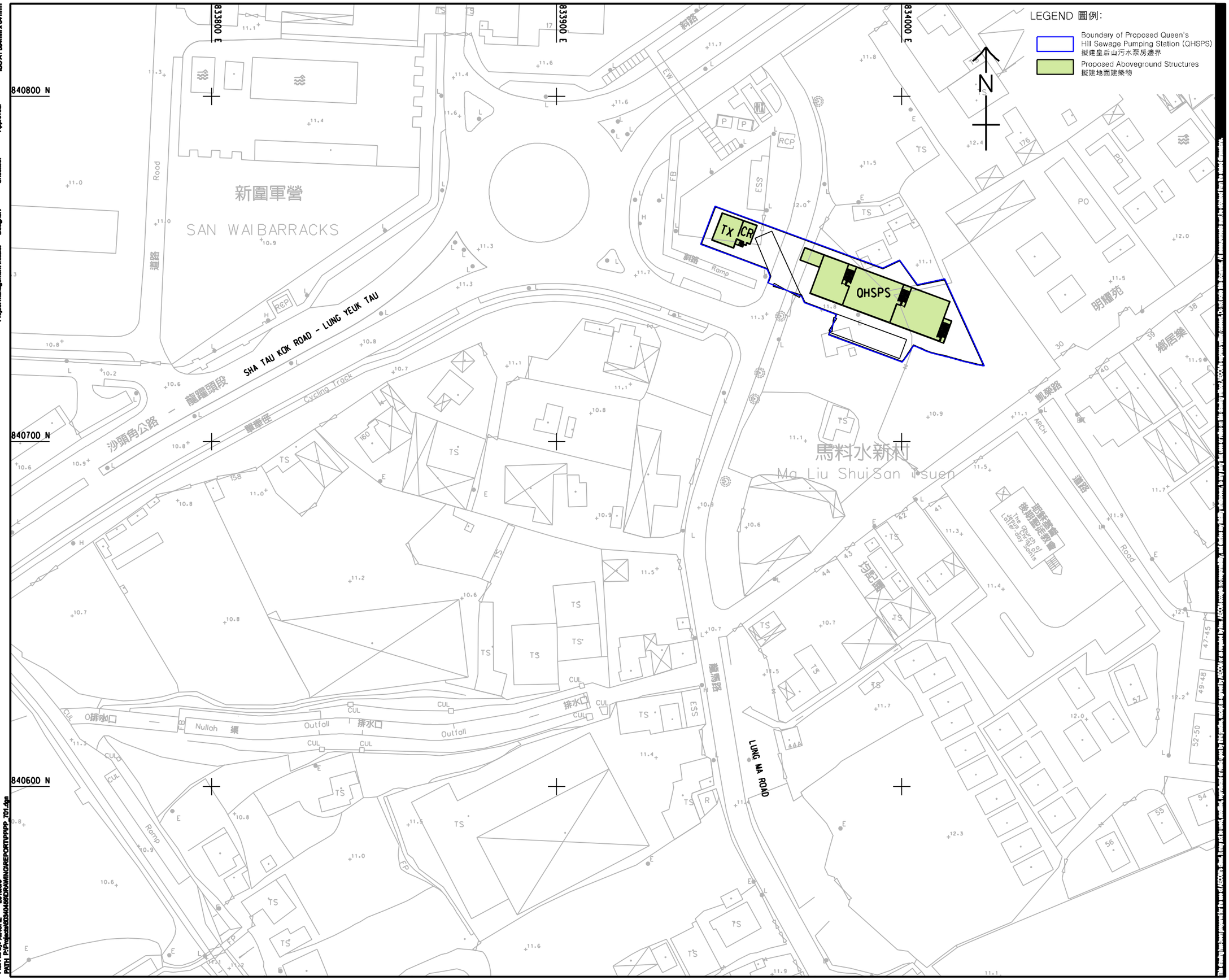
4.5 According to analytical findings, all chemicals testing results of the 26 soil and 6 water samples showed no exceedance of the criteria of RBRG, Soil Saturation Limit and Solubility Limit. Furthermore, no Non-Aqueous Phase Liquid (NAPL) observed during soil and groundwater sampling. Based on the chemical analysis results indicated that the subject assessment site should not be contaminated. It is concluded that remediation of the subject is not required.

Appendix A

Project Location Map

ISO A1 594mm x 841mm

Project Management Initials: Designer: Checked: Approved:



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AECOM

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

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

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

SUB-CONSULTANTS

ISSUE/REVISION

NO.	DATE	DESCRIPTION	CHK.

STATUS

SCALE A1 1 : 500
DIMENSION UNIT METRES

KEY PLAN

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

SHEET TITLE
Site Location Plan
工地位置圖

SHEET NUMBER
60340456/PP/FIGURE 1.1
圖1.1

Appendix B

Designated Potential Contamination Area

NOTES:

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

LEGEND:

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

SETTING OUT POINTS

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

PROJECT 項目

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

CONTRACT TITLE

QUEEN'S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS

CLIENT 業主

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

CONSULTANT 工程顧問公司

ISSUE/REVISION 修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核核

STATUS 階段

SCALE 比例 A1 1 : 250

DIMENSION UNIT 尺寸單位 METRES

KEY PLAN 索引圖

PROJECT NO. 項目編號 60340456

CONTRACT NO. 合約編號 CV/2016/08

SHEET TITLE 圖紙名稱

POTENTIAL CONTAMINATION AREAS UNDER THE PROJECT

SHEET NUMBER 圖紙編號

Project Management Initials: Designer: YHH Checked: SCWC Approved: RCYK ISO A1 594mm x 841mm

Plot File by: CHENHK 2016/9/8
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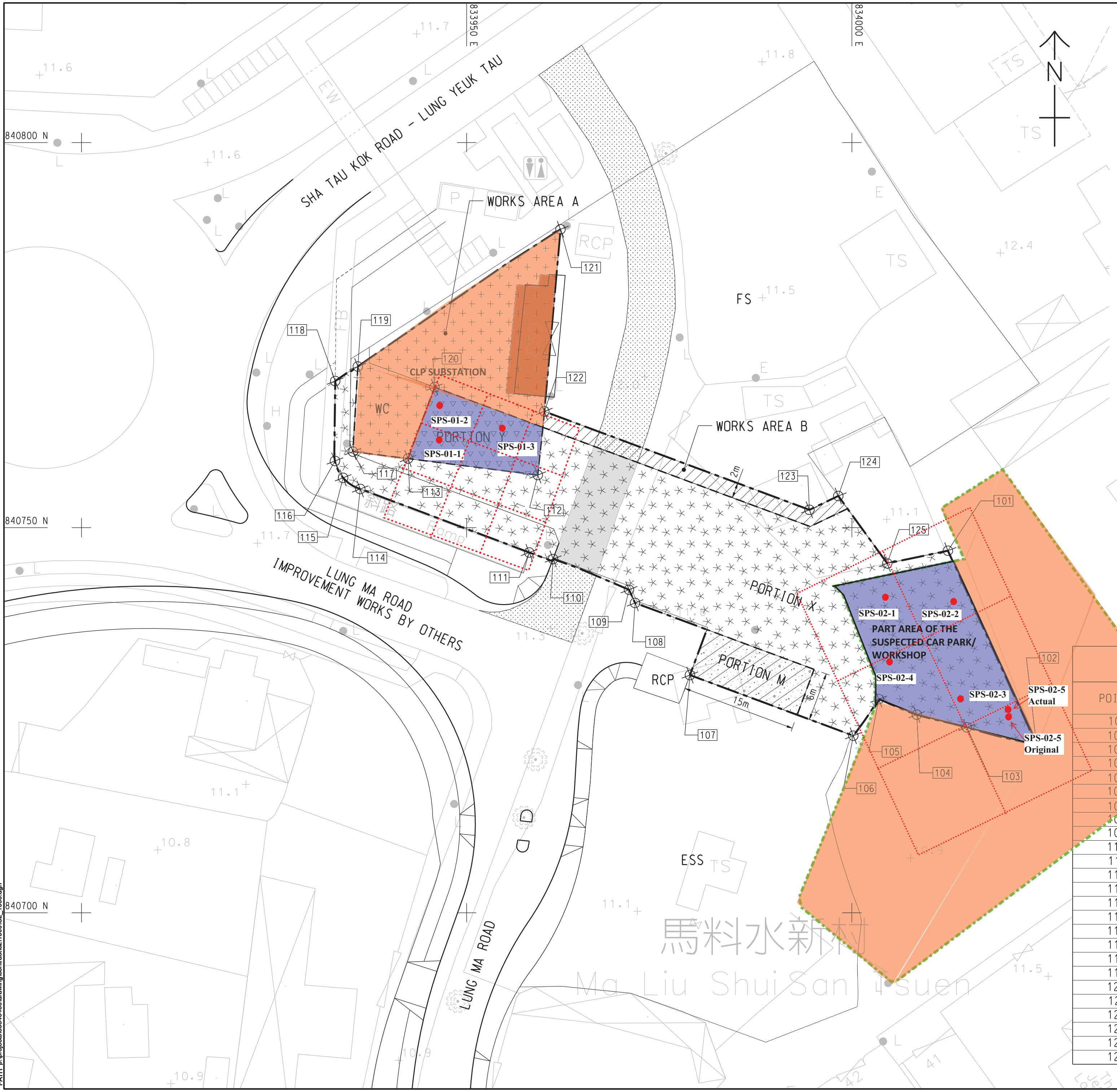
Appendix C

Soil Sampling Location with Photograph Record



NOTES:

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

LEGEND:

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

SETTING OUT POINTS

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

PROJECT 項目

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

CONTRACT TITLE

QUEEN'S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS

CLIENT 業主

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

CONSULTANT 工程顧問公司

ISSUE/REVISION 修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核核

STATUS 階段

SCALE 比例: A1 1 : 250

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN 索引圖

PROJECT NO. 項目編號: 60340456

CONTRACT NO. 合約編號: CV/2016/08

SHEET TITLE 圖紙名稱

POTENTIAL CONTAMINATION AREAS UNDER THE PROJECT

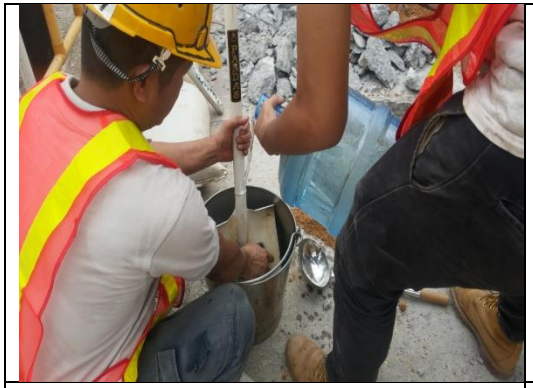
SHEET NUMBER 圖紙編號

Project Management Initials: Designer: YHH Checked: SCWC Approved: RCYK ISO A1 594mm x 841mm

Plot File by: CHENHK 2016/9/8 PATH: p:\projects\60340456\drawing\contract\c2\1000\C2_1003.dgn

		
Soil Sampling location SPS01-1	**Soil Sampling location SPS01-2**	**Soil Sampling location SPS01-3**
		
Soil Sampling location SPS02-1	**Soil Sampling location SPS02-2**	**Soil Sampling location SPS02-3**
		
Soil Sampling location SPS02-4	**Soil Sampling location SPS02-5**	

AUES

			
Cleaning of equipment with phosphate-free detergent (Decon® 90)	**Pit excavation**	**Soil depth measurement**	**Setting up drilling rig**
			
Soil sampling by drilling rig	**Collect soil sample with cleaned stainless steel equipment**	**Soil Equipment Blank 1**	**Soil Equipment Blank 2**
			
Soil Sample SPS01-1 0.5m bgl	**Soil Sample SPS01-1/1.5m bgl**	**Soil Sample SPS01-1/3.0m bgl**	**Soil Sample SPS01-2/0.5m bgl**

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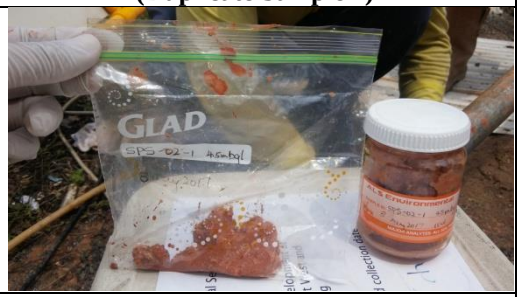
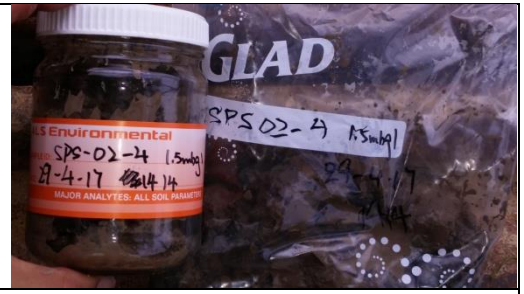
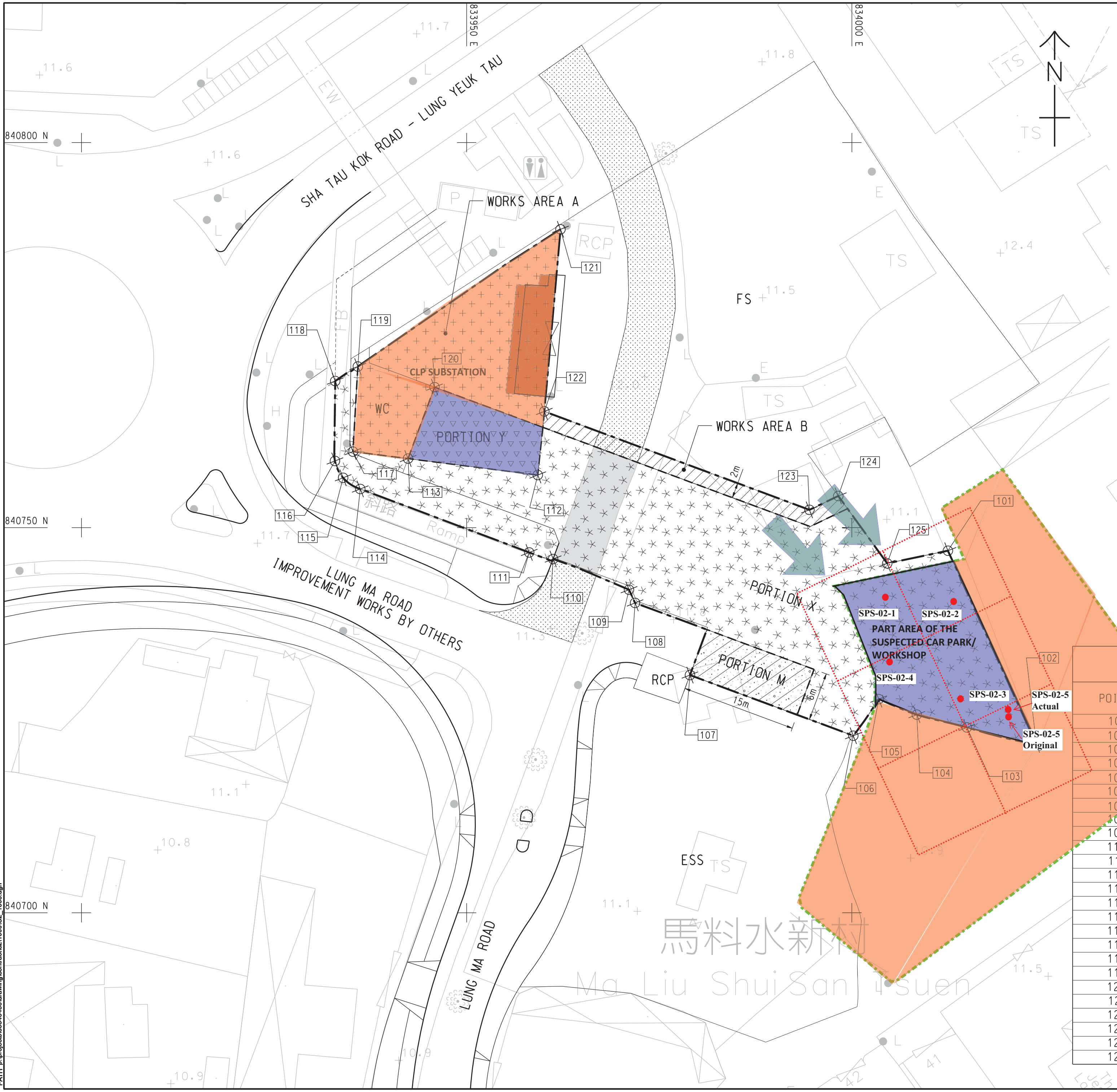
Soil Sample SPS01-2/1.5m bgl	**Soil Sample SPS01-2/3.0m bgl**	**Soil Sample SPS01-3/0.5m bgl**	**Soil Sample SPS01-3/1.5m bgl (Duplicate Sample 1)**
			
Soil Sample SPS01-3/3.0m bgl	**Soil Sample SPS02-1/0.5m bgl**	**Soil Sample SPS02-1/1.5m bgl**	**Soil Sample SPS02-1/4.5m bgl**
			
Soil Sample SPS02-2/0.5m bgl (Duplicate Sample 2)	**Soil Sample SPS02-2/1.5m bgl**	**Soil Sample SPS02-2/4.5m bgl**	**Soil Sample SPS02-3/0.5m bgl**

			
Photo 25 – Soil Sample SPS02-3/1.5 m bgl	**Photo 26 –Soil Sample SPS02-3/4.5m bgl**	**Photo 27 –Soil Sample SPS02-4/0.5m bgl**	**Photo 28 – Soil Sample SPS02-4/1.5m bgl**
			
Photo 29 – Soil Sample SPS02-4/4.5m bgl	**Photo 30 –Soil Sample SPS02-5/0.5m bgl**	**Photo 31 –Soil Sample SPS02-5/1.5m bgl**	**Photo 32 – Soil Sample SPS02-5/4.5m bgl**

Appendix D

Groundwater Sampling Location with Photograph Record



NOTES:

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

LEGEND:

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

SETTING OUT POINTS

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

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PROJECT 項目

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

CONTRACT TITLE

QUEEN'S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS

CLIENT 業主

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

CONSULTANT 工程顧問公司

ISSUE/REVISION 修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 複核

STATUS 階段

SCALE 比例: A1 1 : 250

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN 索引圖

PROJECT NO. 項目編號: 60340456

CONTRACT NO. 合約編號: CV/2016/08

SHEET TITLE 圖紙名稱

POTENTIAL CONTAMINATION AREAS UNDER THE PROJECT

SHEET NUMBER 圖紙編號

Project Management Initials: Designer: YHH Checked: SCWC Approved: RCYK ISO A1 594mm x 841mm

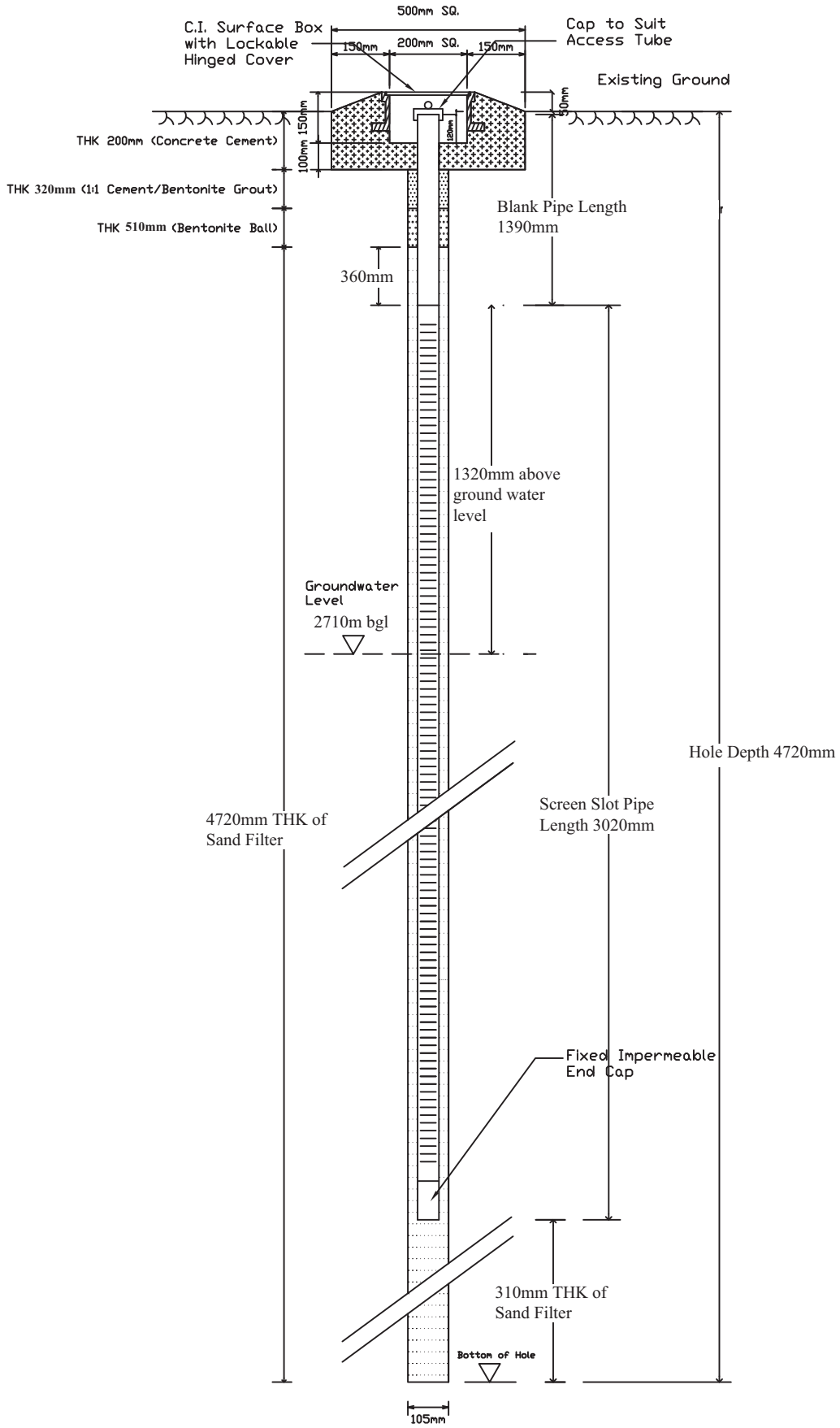
Plot File by: CHENHK 2016/9/8 PATH: p:\projects\60340456\drawing\contract\c21000\C2_1003.dgn

			
Groundwater location SPS02-1	**Groundwater location SPS02-2**	**Groundwater location SPS02-3**	**Groundwater location SPS02-4**
			
Groundwater location SPS02-5			

			
Installed groundwater well	**Cleaning of equipment before groundwater well purging with phosphate-free detergent (Decon® 90)**	**Purging of the Groundwater well**	**Photo 5 – Groundwater sampling**
			
Equipment Blank for Groundwater Sample	**Field Blank for Groundwater Sample**	**Groundwater Sample SPS-02-1-**	**Groundwater Sample SPS-02-2**
			
Groundwater Sample SPS-02-3	**Groundwater Sample SPS-02-4**	**Groundwater Sample SPS-02-5-**	**Groundwater Duplicate Sample**

Appendix E

Typical Drawing with Detailed Information of Groundwater Monitoring Wells Constructed



Not to Scale

Typcial Drawing of Groundwater Well Structure

Well No:	Final Depth:	Reduced Level:	Co-ordinate		Installation Date:
			Easting	**Northing**	
SPS-02-1	**4.72m**	**4.41m**	**834004**	**840741**	**9 May 2017**

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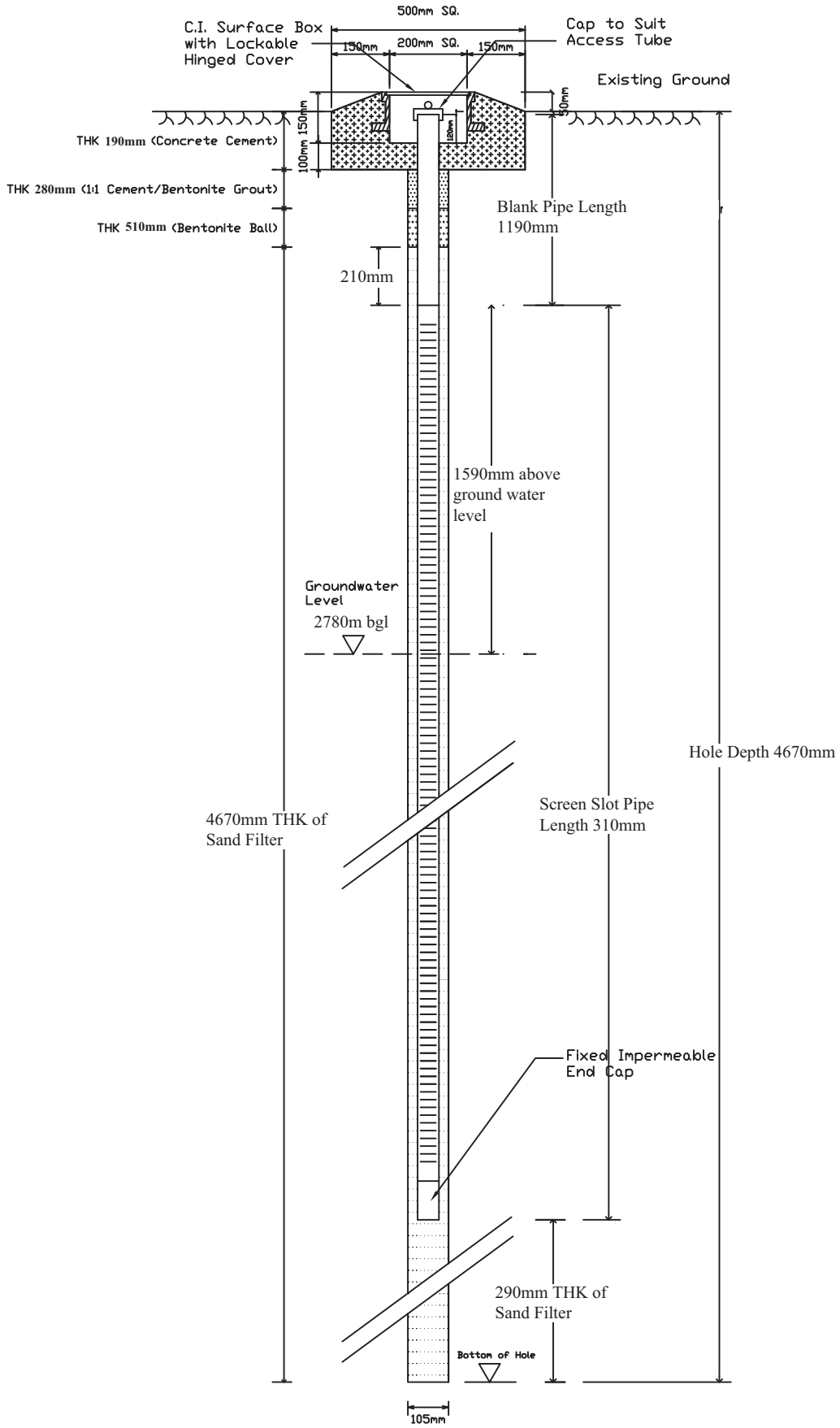
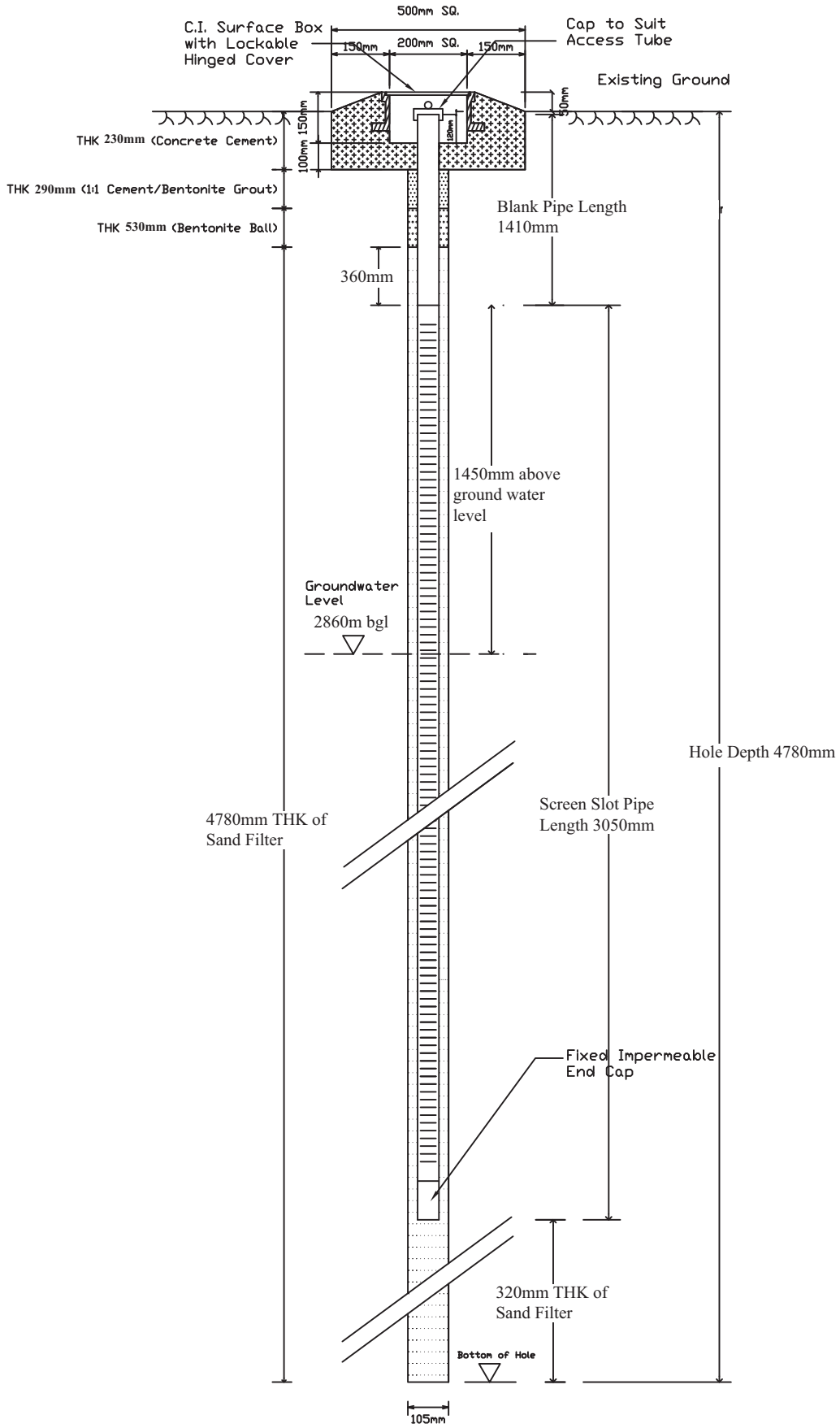


Not to Scale

Typcial Drawing of Groundwater Well Structure

Well No:	Final Depth:	Reduced Level:	Co-ordinate		Installation Date:
			Easting	**Northing**	
SPS-02-2	**4.67m**	**4.38m**	**834013**	**840740**	**10 May 2017**

AUES

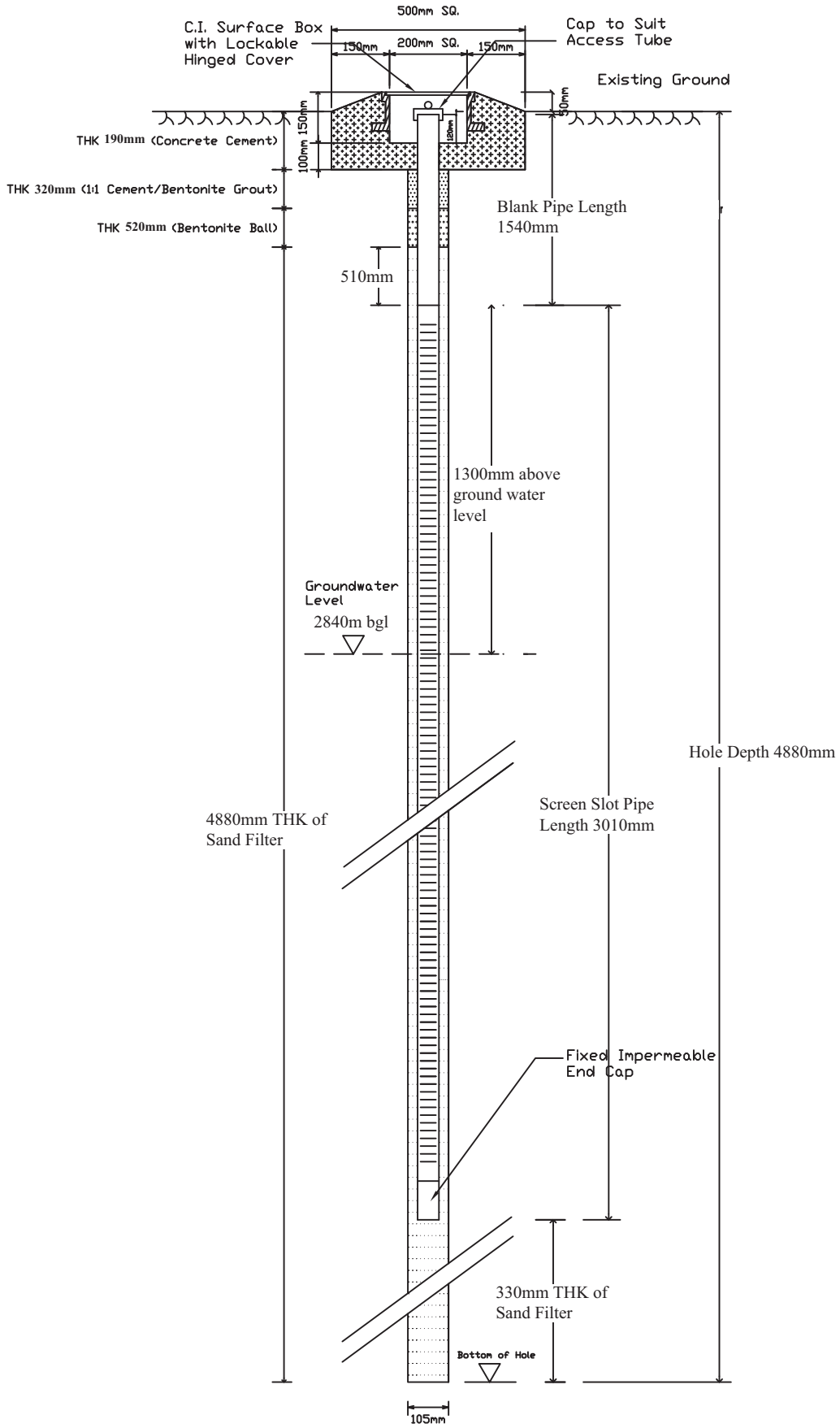


Not to Scale

Typcial Drawing of Groundwater Well Structure

Well No:	Final Depth:	Reduced Level:	Co-ordinate		Installation Date:
			Easting	**Northing**	
SPS-02-3	**4.78m**	**4.46m**	**834012**	**840729**	**11 May 2017**

AUES

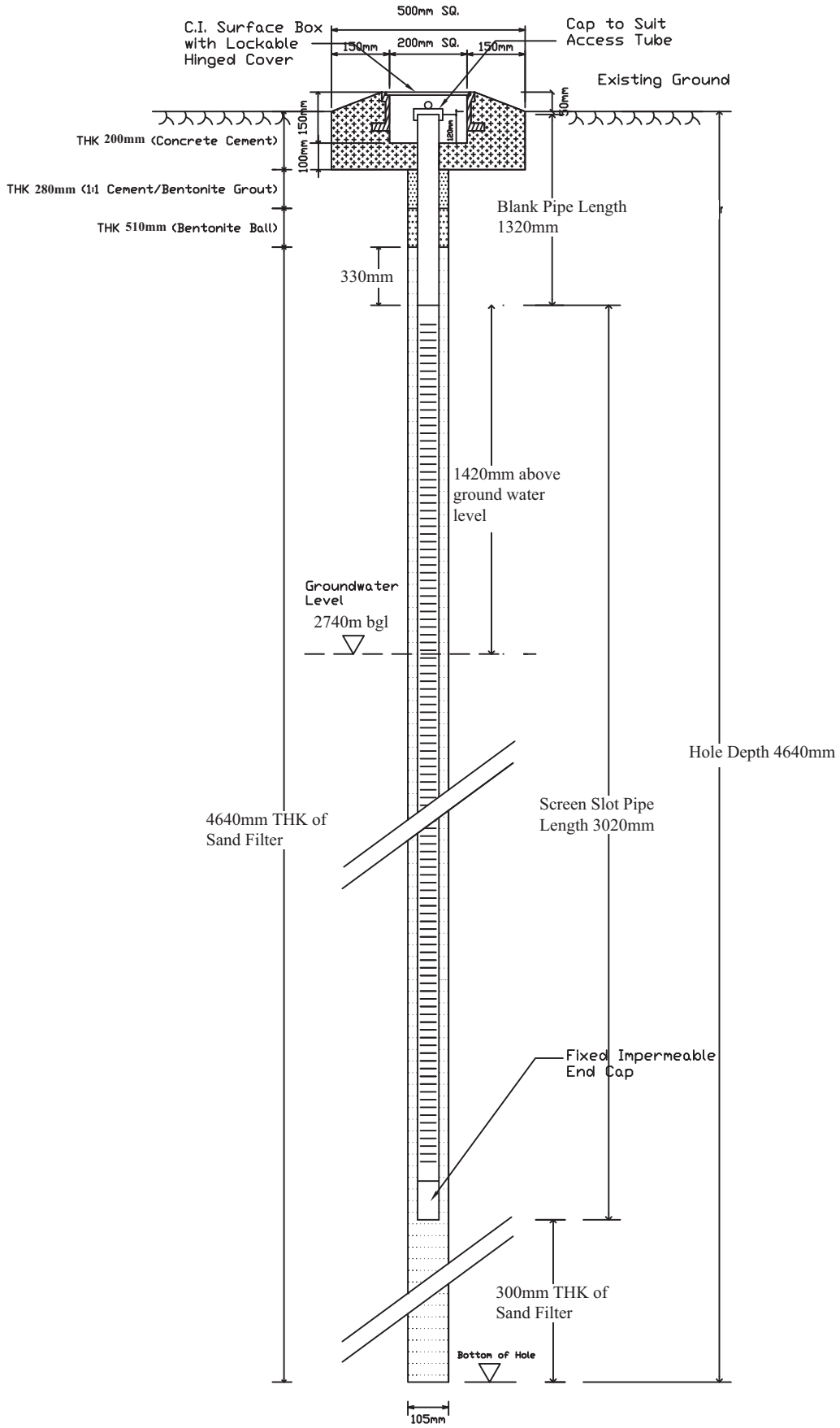


Not to Scale

Typcial Drawing of Groundwater Well Structure

Well No:	Final Depth:	Reduced Level:	Co-ordinate		Installation Date:
			Easting	**Northing**	
SPS-02-4	**4.88m**	**4.55m**	**834004**	**840733**	**9 May 2017**

AUES



Not to Scale

Typcial Drawing of Groundwater Well Structure

Well No:	Final Depth:	Reduced Level:	Co-ordinate		Installation Date:
			Easting	**Northing**	
SPS-02-5	**4.64m**	**4.34m**	**834726**	**840726**	**16 May 2017**

AUES

Appendix F

In-situ Measurement Record for Groundwater Sampling

Groundwater Level Measurement Records

26/8/17

Measurement Time	Depth below the existing ground level (m)					
	SPS-02-1	SPS-02-2	SPS-02-3	SPS-02-4	SPS-02-5	
Before purging of monitoring wells	2.91	2.98	2.96	3.04	3.05	
Before conduct groundwater sampling	3.58	3.47	3.56	3.40	3.24	
After completed groundwater sampling	3.62	3.57	3.66	3.43	3.61	

SAMPLING / ON SITE TESTING LOG SHEET

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Client: China Geo

Location: Queen's Hill

Sampling Date: 26-5-17

Weather: Sunny / Cloudy / Drizzle / Pouring

Sampling Staff: Ivan, Alfred

Co-ordinator: _____

Sample delivered to lab by: _____

Arrival Time: _____

On Site Measurements: Equipment Used: YSI Professional DSS Multiparameter Water Quality Meter / Geotech with CRS-Style Frame Water Interface Meter

Groundwater Well ID	Measurement Time	Detected Below Existing Ground Level (m, bgl)		In-situ Measurement				
		Non-Aqueous Phase Liquid	Groundwater	Non-Aqueous Phase Liquid Thickness (cm)	pH value	Temperature (℃)	Conductivity (μS/cm)	Others / Remarks
SPS-02-1	1445	0	3.58	0	9.21 9.12 9.02	24.4 24.4 24.4	342.4 348.3 350.5	
SPS-02-4	1505	0	3.40	0	8.85 8.92 8.78	23.7 23.8 23.8	869 852 849	
SPS-02-3	1523	0	3.56	0	8.20 8.20 8.18	24.1 24.2 24.2	420 428 431	
SPS-02-2	15:31	0	3.47	0	7.28 7.26 7.25	24.5 24.5 24.5	560 559 560	
SPS-02-5	1542	6	3.24	0	7.13 7.11 7.10	23.6 23.6 23.6	750 751 752	

Appendix G

Soil and Groundwater Sampling Result Summary and Laboratory Testing Report with Chain-of-Custody documents

Soil Sample
(CLP Substation)

Chemical Results Summary of Soil Sample at CLP Substation with QA/QC

Chemicals of Concern		Industrial of RBRGs	Soil Satur. Limit C_{sat}	Reporting Limit	Unit	Soil Sample										QA/QC				
						SPS-01-1			SPS-01-2			SPS-01-3			Duplicate Sample 1			Trip Blank		
						0.5m bgl	1.5m bgl	3.0m bgl	0.5m bgl	1.5m bgl	3.00m bgl	0.50m bgl	1.50m bgl	3.00m bgl		Reporting Limit	Unit	24-Apr-17	25-Apr-17	26-Apr-17
Physical and Aggregate Properties	Moisture Content (dried @103°C)			0.1	%	15.7	18.8	20.0	17.6	28.6	19.1	14.0	15.2	21.2	16.5	N/A	N/A	N/A	N/A	N/A
Heavy Metals	Arsenic	1.96E+02	NA	1	mg/kg	5.0	28.0	17.0	<1	5.0	23.0	2.0	20.0	22.0	22	N/A	N/A	N/A	N/A	N/A
	Cadmium	6.53E+02	NA	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	N/A	N/A	N/A	N/A	N/A
	Mercury	3.84E+01	NA	0.05#	mg/kg	0.2	0.09	0.06	0.1	0.13	0.05	<0.05	<0.05	0.06	<0.05	N/A	N/A	N/A	N/A	N/A
	Nickel	1.00E+04*	NA	1	mg/kg	3.0	2.0	2.0	1.0	4.0	2.0	<1	3.0	2.0	14	N/A	N/A	N/A	N/A	N/A
	Trivalent Chromium	1.00E+04*	NA	1	mg/kg	16.0	11.0	9.0	7.0	17.0	11.0	3.0	6.0	10.0	6	N/A	N/A	N/A	N/A	N/A
	Hexavalent Chromium	1.96E+03	NA	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	N/A	N/A	N/A	N/A	N/A
Polychlorinated Biphenyls (PCBs)	Total Polychlorinated biphenyls	7.48E-01	NA	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	N/A	N/A	N/A	N/A	N/A
Semi-Volatile Organic Compounds (SVOCs)	Naphthalene	4.53E+02	1.25E+02	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N/A	N/A	N/A	N/A	N/A
	Phenol	1.00E+04*	7.26E+03	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N/A	N/A	N/A	N/A	N/A
Petroleum Carbon Ranges	C6 – C8 Fraction	1.00E+04*	1.00E+03	5	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	N/A	N/A	N/A	N/A	N/A
	C9 – C16 Fraction	1.00E+04*	3.00E+03	200	mg/kg	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	N/A	N/A	N/A	N/A	N/A
	C17 – C35 Fraction	1.00E+04*	5.00E+03	500	mg/kg	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	N/A	N/A	N/A	N/A	N/A
Volatile Organic Compounds (VOCs)	Benzene	9.21E+00	3.36E+02	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	5	ug/L	<5	<5	<5
	Toluene	1.00E+04*	2.35E+02	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5	ug/L	<5	<5	<5
	Ethylbenzene	8.24E+03	1.38E+02	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5	ug/L	<5	<5	<5
	Xylenes (Total)	1.23E+03	1.50E+02	2	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	20	ug/L	<20	<20	<20
	2-Propanone (Acetone)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	500	ug/L	<500	<500	<500
	Trichloroethene	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	ug/L	<5	<5	<5
	Methyl tert-Butyl Ether (MTBE)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	ug/L	<5	<5	<5

(#) Reporting Limit of Mercury was smaller than the one stated in the agreed CAP (was 0.2 mg/kg).

(*) Indicates a 'ceiling limit' concentration.

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

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 8
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1716832
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: 862	Quote number	: HK/5386/2016	Date Samples Received	: 24-APR-2017
Order number	: ----			Issue Date	: 09-MAY-2017
C-O-C number	: H031824			No. of samples received	: 2
Site	: QUEEN'S HILL			No. of samples analysed	: 2

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 24-APR-2017 to 05-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1716832

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-0.1-2 0.5MBGL Client sampling date / time: 24-APR-2017 15:57 HK1716832-001	Client sample ID: SPS-0.1-2 1.5MBGL Client sampling date / time: 24-APR-2017 17:10 HK1716832-002			
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**17.6**	**28.6**			
EG: Metals and Major Cations								
EG020: Arsenic	7440-38-2	1	mg/kg	<1	**5**			
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2			
EG020: Mercury	7439-97-6	0.05	mg/kg	**0.10**	**0.13**			
EG020: Nickel	7440-02-0	1	mg/kg	**1**	**4**			
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**7**	**17**			
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1			
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1			
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500			
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50			
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5			
C9 - C16 Fraction	----	200	mg/kg	<200	<200			
C17 - C35 Fraction	----	500	mg/kg	<500	<500			
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2			
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5			
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5			
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0			
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5			
Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0			
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**91.3**	**81.9**			
4-Terphenyl-d14	1718-51-0	0.1	%	**105**	**95.8**			
EP-066S: PCB Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	**79.8**	**67.4**			
Dibutylchlorendate	1770-80-5	0.1	%	**118**	**75.4**			
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
Dibromofluoromethane	1868-53-7	0.1	%	**90.0**	**90.9**			
Toluene-D8	2037-26-5	0.1	%	**103**	**105**			
4-Bromofluorobenzene	460-00-4	0.1	%	**102**	**102**			
EP-074_SR-S: VOC Surrogates								

Sub-Matrix: **SOIL**				*Client sample ID*	**SPS-0.1-2 0.5MBGL**	**SPS-0.1-2 1.5MBGL**			
				Client sampling date / time	24-APR-2017 15:57	24-APR-2017 17:10			
Compound	*CAS Number*	*LOR*	*Unit*		**HK1716832-001**	**HK1716832-002**			
EP-074_SR-S: VOC Surrogates - Continued									
Dibromofluoromethane	1868-53-7	0.1	%		**90.0**	**90.9**			
Toluene-D8	2037-26-5	0.1	%		**103**	**105**			
4-Bromofluorobenzene	460-00-4	0.1	%		**102**	**102**			

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4474254)								
HK1716822-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	13.1	13.0	0.0
HK1717058-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	15.0	15.1	0.8
EG: Metals and Major Cations (QC Lot: 4471318)								
HK1716660-001	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	458	459	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	4	3	0.0
HK1716854-003	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.07	0.08	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	14	14	7.2
		EG020: Nickel	7440-02-0	1	mg/kg	9	9	0.0
EG: Metals and Major Cations (QC Lot: 4471319)								
HK1716516-003	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)								
HK1716272-001	Anonymous	Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4468963)								
HK1716272-001	Anonymous	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4468963)								
HK1716272-001	Anonymous	Phenol	108-95-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467761)								
HK1715629-001	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467775)								
HK1715629-001	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)								
HK1716189-008	Anonymous	Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4471318)											

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4471318) - Continued											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	96.2	----	75	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	95.0	----	80	108	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	104	----	74	114	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	98.2	----	74	106	----	----
EG: Metals and Major Cations (QC Lot: 4471319)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	98.0	----	92	122	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	123	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4468963)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	73.0	----	64	104	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4468963)											
Phenol	108-95-2	500	µg/kg	<500	500 µg/kg	52.3	----	46	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467761)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	100	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	96.8	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467775)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	95.8	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	91.5	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	92.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	95.8	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	96.5	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	96.2	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.4	----	77	134	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4471318)										
HK1716517-001	Anonymous	**EG020: Arsenic**	7440-38-2	5 mg/kg	95.1	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	95.4	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	85.6	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4471319)										
HK1716516-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	91.0	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)										
HK1716189-009	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	99.9	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4468963)										
HK1716272-004	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	71.6	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4468963)										
HK1716272-004	Anonymous	**Phenol**	108-95-2	500 µg/kg	72.0	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467761)										
HK1715629-007	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.6	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	83.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467775)										
HK1715629-007	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	97.1	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%) Low	High
EP-074_SR-S: VOC Surrogates - Continued			
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 7
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1717218
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Project	: 862	Quote number	: HK/5386/2016	Date Samples Received	: 26-APR-2017
Order number	: ----			Issue Date	: 09-MAY-2017
C-O-C number	: H031829			No. of samples received	: 1
Site	: QUEEN'S HILL			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 26-APR-2017 to 08-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1717218

Project Name: Queen's Hill Development - Sewage Pumping Station Works.

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-01-1 1.5M BGL Client sampling date / time: [25-APR-2017] HK1717218-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**18.8**				
EG: Metals and Major Cations								
EG020: Arsenic	7440-38-2	1	mg/kg	**28**				
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2				
EG020: Mercury	7439-97-6	0.05	mg/kg	**0.09**				
EG020: Nickel	7440-02-0	1	mg/kg	**2**				
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**11**				
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1				
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500				
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
Phenol	108-95-2	0.50	mg/kg	<0.50				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5				
C9 - C16 Fraction	----	200	mg/kg	<200				
C17 - C35 Fraction	----	500	mg/kg	<500				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	0.2	mg/kg	<0.2				
Toluene	108-88-3	0.5	mg/kg	<0.5				
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5				
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0				
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5				
Xylenes (Total)	----	2.0	mg/kg	<2.0				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**97.9**				
4-Terphenyl-d14	1718-51-0	0.1	%	**105**				
EP-066S: PCB Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	**66.6**				
Dibutylchlorendate	1770-80-5	0.1	%	**121**				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
Dibromofluoromethane	1868-53-7	0.1	%	**90.4**				
Toluene-D8	2037-26-5	0.1	%	**106**				
4-Bromofluorobenzene	460-00-4	0.1	%	**105**				
EP-074_SR-S: VOC Surrogates								

Sub-Matrix: **SOIL**				Client sample ID	SPS-01-1 1.5M BGL				
				Client sampling date / time	[25-APR-2017]				
Compound	*CAS Number*	*LOR*	*Unit*		HK1717218-001				
EP-074_SR-S: VOC Surrogates - Continued									
Dibromofluoromethane	1868-53-7	0.1	%		**90.4**				
Toluene-D8	2037-26-5	0.1	%		**106**				
4-Bromofluorobenzene	460-00-4	0.1	%		**105**				

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4474943)								
HK1717181-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	21.0	20.9	0.6
HK1717237-005	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	18.5	18.1	1.9
EG: Metals and Major Cations (QC Lot: 4473642)								
HK1717033-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EG: Metals and Major Cations (QC Lot: 4473643)								
HK1717033-002	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.05	0.06	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	23	20	11.8
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
HK1717229-001	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.06	0.06	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	17	17	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)								
HK1716272-001	Anonymous	Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)								
HK1717033-001	Anonymous	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)								
HK1717033-001	Anonymous	Phenol	108-95-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472712)								
HK1717033-001	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472713)								
HK1717033-001	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)								
HK1716189-008	Anonymous	Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642)											

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642) - Continued											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	97.0	----	92	122	----	----
EG: Metals and Major Cations (QC Lot: 4473643)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	88.1	----	75	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	92.9	----	80	108	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	88.4	----	74	114	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	101	----	74	106	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	123	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	74.2	----	64	104	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)											
Phenol	108-95-2	500	µg/kg	<500	500 µg/kg	54.4	----	46	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472712)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	101	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	101	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472713)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	88.9	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	91.5	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	92.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	95.8	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	96.5	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	96.2	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.4	----	77	134	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642)										
HK1717033-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	100	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4473643)										
HK1717033-001	Anonymous	**EG020: Arsenic**	7440-38-2	5 mg/kg	98.0	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	94.9	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	103	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	88.3	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)										
HK1716189-009	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	99.9	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)										
HK1717033-002	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	91.0	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)										
HK1717033-002	Anonymous	**Phenol**	108-95-2	500 µg/kg	70.8	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472712)										
HK1717218-001	SPS-01-1 1.5M BGL	**C9 - C16 Fraction**	----	31.5 mg/kg	102	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	106	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472713)										
HK1717218-001	SPS-01-1 1.5M BGL	**C6 - C8 Fraction**	----	4.5 mg/kg	93.5	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 7
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1717033
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: 862	Quote number	: HK/5386/2016	Date Samples Received	: 25-APR-2017
Order number	: ----			Issue Date	: 08-MAY-2017
C-O-C number	: H031826			No. of samples received	: 2
Site	: QUEEN'S HILL			No. of samples analysed	: 2

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 25-APR-2017 to 08-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1717033

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-01-1 0.5MBGL Client sampling date / time: 25-APR-2017 14:10 HK1717033-001	Client sample ID: SPS-01-2 3.0MBGL Client sampling date / time: 25-APR-2017 13:42 HK1717033-002			
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**15.7**	**19.1**			
EG: Metals and Major Cations								
EG020: Arsenic	7440-38-2	1	mg/kg	**5**	**23**			
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2			
EG020: Mercury	7439-97-6	0.05	mg/kg	**0.20**	**0.05**			
EG020: Nickel	7440-02-0	1	mg/kg	**3**	**2**			
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**16**	**11**			
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1			
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1			
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500			
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50			
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5			
C9 - C16 Fraction	----	200	mg/kg	<200	<200			
C17 - C35 Fraction	----	500	mg/kg	<500	<500			
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2			
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5			
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5			
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0			
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5			
Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0			
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**106**	**104**			
4-Terphenyl-d14	1718-51-0	0.1	%	**102**	**106**			
EP-066S: PCB Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	**78.6**	**67.2**			
Dibutylchlorendate	1770-80-5	0.1	%	**120**	**114**			
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
Dibromofluoromethane	1868-53-7	0.1	%	**90.3**	**93.9**			
Toluene-D8	2037-26-5	0.1	%	**109**	**104**			
4-Bromofluorobenzene	460-00-4	0.1	%	**106**	**105**			
EP-074_SR-S: VOC Surrogates								

Sub-Matrix: **SOIL**				Client sample ID	SPS-01-1 0.5MBGL	SPS-01-2 3.0MBGL			
				Client sampling date / time	25-APR-2017 14:10	25-APR-2017 13:42			
Compound	*CAS Number*	*LOR*	*Unit*		**HK1717033-001**	**HK1717033-002**			
EP-074_SR-S: VOC Surrogates - Continued									
Dibromofluoromethane	1868-53-7	0.1	%		**90.3**	**93.9**			
Toluene-D8	2037-26-5	0.1	%		**109**	**104**			
4-Bromofluorobenzene	460-00-4	0.1	%		**106**	**105**			

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4474942)								
HK1717033-001	SPS-01-1 0.5MBGL	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	15.7	15.6	0.0
HK1717162-009	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	24.1	24.2	0.5
EG: Metals and Major Cations (QC Lot: 4473642)								
HK1717033-002	SPS-01-2 3.0MBGL	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EG: Metals and Major Cations (QC Lot: 4473643)								
HK1717033-002	SPS-01-2 3.0MBGL	EG020: Mercury	7439-97-6	0.05	mg/kg	0.05	0.06	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	23	20	11.8
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
HK1717229-001	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.06	0.06	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	17	17	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)								
HK1716272-001	Anonymous	Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)								
HK1717033-001	SPS-01-1 0.5MBGL	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)								
HK1717033-001	SPS-01-1 0.5MBGL	Phenol	108-95-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467761)								
HK1715629-001	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467775)								
HK1715629-001	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)								
HK1716189-008	Anonymous	Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642)											

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642) - Continued											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	97.0	----	92	122	----	----
EG: Metals and Major Cations (QC Lot: 4473643)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	88.1	----	75	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	92.9	----	80	108	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	88.4	----	74	114	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	101	----	74	106	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	123	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	74.2	----	64	104	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)											
Phenol	108-95-2	500	µg/kg	<500	500 µg/kg	54.4	----	46	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467761)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	100	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	96.8	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467775)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	95.8	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	91.5	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	92.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	95.8	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	96.5	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	96.2	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.4	----	77	134	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642)										
HK1717033-001	SPS-01-1 0.5MBGL	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	100	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4473643)										
HK1717033-001	SPS-01-1 0.5MBGL	**EG020: Arsenic**	7440-38-2	5 mg/kg	98.0	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	94.9	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	103	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	88.3	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)										
HK1716189-009	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	99.9	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)										
HK1717033-002	SPS-01-2 3.0MBGL	**Naphthalene**	91-20-3	500 µg/kg	91.0	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)										
HK1717033-002	SPS-01-2 3.0MBGL	**Phenol**	108-95-2	500 µg/kg	70.8	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467761)										
HK1715629-007	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.6	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	83.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4467775)										
HK1715629-007	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	97.1	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 7
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1717229
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Project	: 862	Quote number	: HK/5386/2016	Date Samples Received	: 26-APR-2017
Order number	: ----			Issue Date	: 09-MAY-2017
C-O-C number	: H031828			No. of samples received	: 4
Site	: QUEEN'S HILL			No. of samples analysed	: 4

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 26-APR-2017 to 08-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1717229

Project Name: Queen's Hill Development - Sewage Pumping Station Works.

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-01-1 3.0M BGL	SPS-01-3 0.5M BGL	SPS-01-3 1.5M BGL	SPS-01-3 3.0M BGL
				Client sampling date / time: 26-APR-2017 11:41	26-APR-2017 13:50	26-APR-2017 14:24	26-APR-2017 15:47
				HK1717229-001	HK1717229-002	HK1717229-003	HK1717229-004
EA/ED: Physical and Aggregate Properties							
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**20.0**	**14.0**	**15.2**	**21.2**
EG: Metals and Major Cations							
EG020: Arsenic	7440-38-2	1	mg/kg	**17**	**2**	**20**	**22**
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
EG020: Mercury	7439-97-6	0.05	mg/kg	**0.06**	<0.05	<0.05	**0.06**
EG020: Nickel	7440-02-0	1	mg/kg	**2**	<1	**3**	**2**
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**9**	**3**	**6**	**10**
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	<1	<1
EP-066: Polychlorinated Biphenyls							
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)							
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate							
Phenol	108-95-2	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)							
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5	<5
C9 - C16 Fraction	----	200	mg/kg	<200	<200	<200	<200
C17 - C35 Fraction	----	500	mg/kg	<500	<500	<500	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)							
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5
Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							
2-Fluorobiphenyl	321-60-8	0.1	%	**87.9**	**103**	**90.3**	**103**
4-Terphenyl-d14	1718-51-0	0.1	%	**105**	**101**	**101**	**104**
EP-066S: PCB Surrogate							
Tetrachlorometaxylene	877-09-8	0.1	%	**63.2**	**61.0**	**60.4**	**74.8**
Dibutylchlorendate	1770-80-5	0.1	%	**117**	**112**	**108**	**124**
EP-080_SRS: TPH(Volatile)/BTEX Surrogate							
Dibromofluoromethane	1868-53-7	0.1	%	**90.8**	**92.5**	**89.9**	**95.6**
Toluene-D8	2037-26-5	0.1	%	**101**	**103**	**105**	**106**
4-Bromofluorobenzene	460-00-4	0.1	%	**104**	**104**	**105**	**104**
EP-074_SR-S: VOC Surrogates							

Sub-Matrix: **SOIL**				Client sample ID	SPS-01-1 3.0M BGL	SPS-01-3 0.5M BGL	SPS-01-3 1.5M BGL	SPS-01-3 3.0M BGL	
				Client sampling date / time	26-APR-2017 11:41	26-APR-2017 13:50	26-APR-2017 14:24	26-APR-2017 15:47	
Compound	*CAS Number*	*LOR*	*Unit*		HK1717229-001	HK1717229-002	HK1717229-003	HK1717229-004	
EP-074_SR-S: VOC Surrogates - Continued									
Dibromofluoromethane	1868-53-7	0.1	%		**90.8**	**92.5**	**89.9**	**95.6**	
Toluene-D8	2037-26-5	0.1	%		**101**	**103**	**105**	**106**	
4-Bromofluorobenzene	460-00-4	0.1	%		**104**	**104**	**105**	**104**	

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4474943)								
HK1717181-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	21.0	20.9	0.6
HK1717237-005	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	18.5	18.1	1.9
EG: Metals and Major Cations (QC Lot: 4473642)								
HK1717033-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EG: Metals and Major Cations (QC Lot: 4473643)								
HK1717033-002	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.05	0.06	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	23	20	11.8
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
HK1717229-001	SPS-01-1 3.0M BGL	EG020: Mercury	7439-97-6	0.05	mg/kg	0.06	0.06	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	17	17	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)								
HK1716272-001	Anonymous	Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)								
HK1717033-001	Anonymous	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)								
HK1717033-001	Anonymous	Phenol	108-95-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472712)								
HK1717033-001	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472713)								
HK1717033-001	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)								
HK1716189-008	Anonymous	Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642)											

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642) - Continued											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	97.0	----	92	122	----	----
EG: Metals and Major Cations (QC Lot: 4473643)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	88.1	----	75	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	92.9	----	80	108	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	88.4	----	74	114	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	101	----	74	106	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	123	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	74.2	----	64	104	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)											
Phenol	108-95-2	500	µg/kg	<500	500 µg/kg	54.4	----	46	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472712)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	101	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	101	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472713)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	88.9	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	91.5	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	92.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	95.8	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	96.5	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	96.2	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.4	----	77	134	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642)										
HK1717033-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	100	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4473643)										
HK1717033-001	Anonymous	**EG020: Arsenic**	7440-38-2	5 mg/kg	98.0	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	94.9	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	103	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	88.3	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)										
HK1716189-009	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	99.9	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)										
HK1717033-002	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	91.0	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)										
HK1717033-002	Anonymous	**Phenol**	108-95-2	500 µg/kg	70.8	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472712)										
HK1717218-001	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	102	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	106	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472713)										
HK1717218-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	93.5	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 7
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1717227
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: 862	Quote number	: HK/5386/2016	Date Samples Received	: 26-APR-2017
Order number	: ----			Issue Date	: 09-MAY-2017
C-O-C number	: H031831			No. of samples received	: 1
Site	: QUEEN'S HILL			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 26-APR-2017 to 08-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1717227

Project Name: Queen's Hill Development - Sewage Pumping Station Works.

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: DUPLICATE SAMPLE 1				
				Client sampling date / time: 26-APR-2017 14:24				
				HK1717227-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**16.5**				
EG: Metals and Major Cations								
EG020: Arsenic	7440-38-2	1	mg/kg	**22**				
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2				
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05				
EG020: Nickel	7440-02-0	1	mg/kg	**14**				
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**6**				
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1				
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500				
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
Phenol	108-95-2	0.50	mg/kg	<0.50				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5				
C9 - C16 Fraction	----	200	mg/kg	<200				
C17 - C35 Fraction	----	500	mg/kg	<500				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	0.2	mg/kg	<0.2				
Toluene	108-88-3	0.5	mg/kg	<0.5				
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5				
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0				
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5				
Xylenes (Total)	----	2.0	mg/kg	<2.0				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**98.0**				
4-Terphenyl-d14	1718-51-0	0.1	%	**104**				
EP-066S: PCB Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	**54.2**				
Dibutylchlorendate	1770-80-5	0.1	%	**72.6**				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
Dibromofluoromethane	1868-53-7	0.1	%	**91.3**				
Toluene-D8	2037-26-5	0.1	%	**105**				
4-Bromofluorobenzene	460-00-4	0.1	%	**104**				
EP-074_SR-S: VOC Surrogates								

Sub-Matrix: **SOIL**				Client sample ID	DUPLICATE SAMPLE 1				
				Client sampling date / time	26-APR-2017 14:24				
Compound	*CAS Number*	*LOR*	*Unit*		**HK1717227-001**				
EP-074_SR-S: VOC Surrogates - Continued									
Dibromofluoromethane	1868-53-7	0.1	%		**91.3**				
Toluene-D8	2037-26-5	0.1	%		**105**				
4-Bromofluorobenzene	460-00-4	0.1	%		**104**				

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4474943)								
HK1717181-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	21.0	20.9	0.6
HK1717237-005	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	18.5	18.1	1.9
EG: Metals and Major Cations (QC Lot: 4473642)								
HK1717033-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EG: Metals and Major Cations (QC Lot: 4473643)								
HK1717033-002	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.05	0.06	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	23	20	11.8
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
HK1717229-001	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.06	0.06	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	17	17	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)								
HK1716272-001	Anonymous	Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)								
HK1717033-001	Anonymous	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)								
HK1717033-001	Anonymous	Phenol	108-95-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472712)								
HK1717033-001	Anonymous	C9 - C16 Fraction	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472713)								
HK1717033-001	Anonymous	C6 - C8 Fraction	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)								
HK1716189-008	Anonymous	Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642)											

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642) - Continued											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	97.0	----	92	122	----	----
EG: Metals and Major Cations (QC Lot: 4473643)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	88.1	----	75	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	92.9	----	80	108	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	88.4	----	74	114	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	101	----	74	106	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	123	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	74.2	----	64	104	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)											
Phenol	108-95-2	500	µg/kg	<500	500 µg/kg	54.4	----	46	115	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472712)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	101	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	101	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472713)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	88.9	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4468968)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	91.5	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	92.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	95.8	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	96.5	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	96.2	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.4	----	77	134	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4473642)										
HK1717033-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	100	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4473643)										
HK1717033-001	Anonymous	**EG020: Arsenic**	7440-38-2	5 mg/kg	98.0	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	94.9	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	103	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	88.3	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4468964)										
HK1716189-009	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	99.9	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4472711)										
HK1717033-002	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	91.0	----	50	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4472711)										
HK1717033-002	Anonymous	**Phenol**	108-95-2	500 µg/kg	70.8	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472712)										
HK1717218-001	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	102	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	106	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4472713)										
HK1717218-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	93.5	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1716831
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: 862	Quote number	: HK/5386/2016	Date Samples Received	: 24-APR-2017
Order number	: ----			Issue Date	: 05-MAY-2017
C-O-C number	: H031825			No. of samples received	: 1
Site	: QUEEN'S HILL			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 24-APR-2017 to 05-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1716831

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: [24-APR-2017] HK1716831-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**95.7**				
Toluene-D8	2037-26-5	0.1	%	**96.6**				
4-Bromofluorobenzene	460-00-4	0.1	%	**102**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4470097)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	91.0	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	87.2	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	92.6	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	91.3	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	97.6	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	93.4	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4470097)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	108	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4470097)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	87.3	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4470097)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	88.5	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1717030
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: 862	Quote number	: HK/5386/2016	Date Samples Received	: 25-APR-2017
Order number	: ----			Issue Date	: 08-MAY-2017
C-O-C number	: H031827			No. of samples received	: 1
Site	: QUEEN'S HILL			No. of samples analysed	: 1

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This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 25-APR-2017 to 06-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1717030

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: [25-APR-2017] HK1717030-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**92.4**				
Toluene-D8	2037-26-5	0.1	%	**99.0**				
4-Bromofluorobenzene	460-00-4	0.1	%	**101**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4470097)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	91.0	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	87.2	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	92.6	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	91.3	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	97.6	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	93.4	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4470097)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	108	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4470097)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	87.3	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4470097)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	88.5	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1717215
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: 862	Quote number	: HK/5386/2016	Date Samples Received	: 26-APR-2017
Order number	: ----			Issue Date	: 08-MAY-2017
C-O-C number	: H031830			No. of samples received	: 1
Site	: QUEEN'S HILL			No. of samples analysed	: 1

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This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 26-APR-2017 to 06-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1717215

Project Name: Queen's Hill Development - Sewage Pumping Station Works.

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: [26-APR-2017] HK1717215-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**90.9**				
Toluene-D8	2037-26-5	0.1	%	**99.1**				
4-Bromofluorobenzene	460-00-4	0.1	%	**98.7**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4470097)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	91.0	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	87.2	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	92.6	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	91.3	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	97.6	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	93.4	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4470097)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	108	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4470097)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	87.3	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4470097)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	88.5	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

CHAIN OF CUSTODY DOCUMENTATION

H 031824

ALS Laboratory Group

CLIENT: AECOM	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): TAM TAK WING	PHONE
PROJECT ID: ~~Queen's Hill~~ 862	EMAIL REPORT TO:
SITE: Queen's Hill P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	ANALYSIS REQUIRED Including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate)

Intact: Yes No (N/A)

SAMPLE TEMPERATURE

CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

Notes: e.g. Highly contaminated samples

e.g. "High PAHs expected"

Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		Metals – Arsenic, Cadmium, Chromium, Nickel	Metals – Mercury and Nickel	TPH (C6-C8), PCB (C6-C8),	DCB (C9-C16),	PCB (C17-C35)	VOCs – Benzene / Toluene	VOCs – Ethylbenzene and Xylenes (total)	SVOCs – Phenol and Naphthalene	PCBs				
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
1	SDS-01-2 0.5mbgl	Soil	24 Apr 17	15:57	1x gar	1	/	/	/	/	/	/	/	/	/				
2	SDS-01-2 1.5mbgl	soil	24 Apr 17	17:10	1x gar	1	/	/	/	/	/	/	/	/	/				

ALS Technichem (HK) Pty Ltd

Work Order

HK1716832

Telephone : +852 2610 1044

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Ivan Ip	Date: 24 Apr 17	Name:	Date: 25/4/2017	Con' Note No:
Of:	Time:	Of: ALS	Time: 19:20	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION

H 031829

ALS Laboratory Group

CLIENT: Aus	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): TAM TAK WANG	PHONE
PROJECT ID: 862	EMAIL REPORT TO:
SITE: Queen's Hills P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	**ANALYSIS REQUIRED including SUITES** (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

SAMPLE INFORMATION (note: S = Soil, W=Water) | CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	Metals — Arsenic	Cadmium, Chromium III, IV	Mercury and Nickel	PCB C6-C8 C9-C16 C17-C35	VOCs — Benzene Toluene Ethylbenzene	Xylenes (totals)	SVOCs — Phenol Naphthalene	PCBs
1.	SDS-01-1 1.5m Dgl	Soil	25 Apr		1 ~~Clear~~ jar Gr	1	/	/	/	/	/	/	/	/
							/	/	/	/	/	/	/	/

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Iran Ip	Date: 26 Apr 2017	Name:	Date: 26/4/2017	Con' Note No:
Of:	Time:	Of: ALS	Time: 17:40	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION

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ALS Laboratory Group

CLIENT: Aues	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): TAM TAK WING	PHONE
PROJECT ID: ~~682~~ 862	EMAIL REPORT TO:
SITE: Queen's Hills P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	**ANALYSIS REQUIRED including SUITES** (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A (circled)
SAMPLE TEMPERATURE
CHILLED: Yes (circled) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	Metals – Arsenic, Cadmium,	Metals – Chromium, III/IV, Mercury and Nickel	PCR – (C6-C8),	PCR – (C9-C16),	PCR – (C17-C35)	VOCs – Benzene, Toluene, Ethylbenzene and Xylenes (total)	SVOCs – Phenol and Naphthalene,	PCBs,					
1.	SPS-01-1 0.5mbgl	Soil	25Apr2017	1410	1x Gar	1	✓	✓	✓	✓	✓	✓	✓	✓					
2.	SPS-01-2 3.0mbgl	Soil	25Apr2017	1347	1x Gar	1	✓	✓	✓	✓	✓	✓	✓	✓					

SAMPLE INFORMATION (note: S = Soil, W=Water) — CONTAINER INFORMATION

ALS Technichem (HK) Pty Ltd
Work Order
HK1717033
Telephone : +852 2610 1044

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Ivan Ip	Date: 25 Apr 2017	Name:	Date:	Con' Note No:
Of:	Time: 18:00	Of:	Time:	
Name:	Date:	Name: Kotsu Lau	Date: 25-Apr-2017	Transport Co:
Of:	Time:	Of: ALS HK	Time: 18:25	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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ALS Laboratory Group

CLIENT: Aues	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): TAM TAK WING	PHONE
PROJECT ID: 862	EMAIL REPORT TO:
SITE: Queen's Hills P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	**ANALYSIS REQUIRED including SUITES**(note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		Metals – Arsenic, Cadmium	Chromium VI, IV	Mercury and Nickel	PCB – C6 – C8 C9 – C16 C17 – C35	VOCs – Benzene, Toluene, Ethylbenzene	Xylenes (total)	SVOCs – Phenol	Naphthalene	PCBs						Notes: e.g. Highly contaminated samples e.g. "High PAHs expected" Extra volume for QC or trace LORs etc.
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles															
1	SPS-01-1 3.0m bgl	Soil	26-Apr	1141	1 jar	1	/	/	/	/	/	/	/	/							
2	SPS-01-3 0.5m bgl	Soil	26Apr	1350	1 jar	1	/	/	/	/	/	/	/	/							
3	SPS-01-3 1.5m bgl	Soil	26Apr	1424	1 jar	1	/	/	/	/	/	/	/	/							
4	SPS-01-3 3.0m bgl	Soil	26Apr	1547	1 jar	1	/	/	/	/	/	/	/	/							

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Ivan Yp	Date: 26 Apr 2017	Name:	Date: 26/4/2017	Con' Note No:
Of:	Time:	Of: ALS	Time: 17:40	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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ALS Laboratory Group

CLIENT: Aues	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): TAM TAK WING	PHONE
PROJECT ID: 862	EMAIL REPORT TO:
SITE: Queen's Hills P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		Metals — Arsenic	Cadmium	Chromium III IV	Mercury	Nickel	PCB C6-C8, C9-C16	PCB C17 - 35	VOCs - Benzene, Toluene, Ethylbenzene and Xylenes (BTEX)	SVOCs. Phenol, Naphthalene, PCBs							Notes: e.g. Highly contaminated samples e.g. "High PAHs expected" Extra volume for QC or trace LORs etc.
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles																
1.	Duplicate sample 1	Soil	26 Apr 17	14:34	1 [redacted] jar	1	1	1	1	1	1	1	1	1	1	1						

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Ivan Ip	Date: 26 Apr 17	Name:	Date: 26/4/2017	Con' Note No:
Of:	Time:	Of: ALS	Time: 17:40	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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H 031825

ALS Laboratory Group

CLIENT: AWS	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): TAM TAK WING	PHONE
PROJECT ID: 862	EMAIL REPORT TO:
SITE: Queen's Hill P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate)

Intact: Yes No (N/A)

SAMPLE TEMPERATURE

CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		VOCs – Acetone	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Methyl tert Butyl Ether	Trichloroethene						
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
1	Trip Blank	Water	24Apr17		2x40ml glass	2	/	/	/	/	/	/	/						

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Work Order

HK1716831

Telephone : +852 2610 1044

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Ivan Ip	Date: 24 Apr 17	Name:	Date: 24/4/2017	Con' Note No:
Of:	Time:	Of: ALS	Time: 19:50	
Name:	Date:	Name:	Date:	Transport Co:
Of:	Time:	Of:	Time:	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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ALS Laboratory Group

CLIENT: Aues	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): TAM TAK WING	PHONE
PROJECT ID: ~~EQ~~ 862	EMAIL REPORT TO:
SITE: Queen's Hills P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate)

Intact: Yes No N/A

SAMPLE TEMPERATURE

CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected"
Extra volume for QC or trace LORs etc.

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		VOCs - Acetone,	Benzene	Toluene	Ethylbenzene	Xylenes (total)	Methyl tert-Butyl Ether	Trichloroethene						
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles													
1.	Trip Blank	Water	25Apr		2x40ml glasses	2	✓	✓	✓	✓	✓	✓	✓						

ALS Technichem (HK) Pty Ltd

Work Order

HK1717030

Telephone : +852 2610 1044

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Evan Ip	Date: 25 Apr 2017	Name:	Date:	Con' Note No:
Of:	Time: 1803	Of:	Time:	
Name:	Date:	Name:	Date: 26-Apr-2017	Transport Co:
Of:	Time:	Of:	Time: 18:25	

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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ALS Laboratory Group

CLIENT: Aues	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): TAM TAK WING	PHONE
PROJECT ID: 862	EMAIL REPORT TO:
SITE: Queen's Hills P.O. NO.:	EMAIL INVOICE TO: (if different to report)
RESULTS REQUIRED (Date): QUOTE NO.:	**ANALYSIS REQUIRED Including SUITES**(note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No (N/A)
SAMPLE TEMPERATURE
CHILLED: (Yes) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DIPOSAL:

SAMPLE INFORMATION (note: S = Soil, W=Water) | CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	VOCs — Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (total), Methyl tert-Butyl Ether, Trichloroethene,											Notes: e.g. Highly contaminated samples e.g. "High PAHs expected" Extra volume for QC or trace LORs etc.
1.	Trip Blank		26 Apr		1x40ml Glass	1	✓	✓	✓	✓								

RELINQUISHED BY:

Name: Ivan Ip	Date: 26 Apr 17	Name:	Date: 26/4/2017
Of:	Time:	Of: ALS	Time: 17:50
Name:	Date:	Name:	Date:
Of:	Time:	Of:	Time:

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Con' Note No:

Transport Co:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulfuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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Soil Sample
(Suspected Carpark/Workshop)

Chemical Results Summay of Soil Sample at Carpark/Work shop with QA/QC

Chemicals of Concern		Industrial of RBRGs	Soil Satur. Limit C_{sat}	Reporting Limit	Unit	Soil Sample																QA/QC										
						SPS-02-1			SPS-02-2			SPS-02-3			SPS-02-4			SPS-02-5			Duplicate Sample 2	Equipment Blank				Field Blank		Trip Blank				
						0.50m bgl	1.50m bgl	4.50m bgl	0.50m bgl	1.50m bgl	4.50m bgl	0.50m bgl	1.50m bgl	4.50m bgl	0.50m bgl	1.50m bgl	4.50m bgl	0.50m bgl	1.50m bgl	4.50m bgl		Reporting Limit	Unit	Equipment Blank 1 (µg/L)	Equipment Blank 2 (µg/L)	9-May-17	16-May-17	29-Apr-17	9-May-17	10-May-17	11-May-17	16-May-17
Physical and Aggregate Properties	Moisture Content (dried @103°C)			0.1	%	17.9	25.0	31.7	14.5	20.5	28.1	18.6	20.8	28.8	23.7	27.9	20.3	24.1	20.4	25.4	15.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Metals	Antimony	2.61E+02	N/A	1	mg/kg	<1	<1	<1	<1	<1	<1	1	1	1	<1	<1	<1	1	<1	<1	<1	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Arsenic	1.96E+02	N/A	1	mg/kg	4	21	22	8	18	11	9	21	45	22	12	13	6	6	12	11	10	ug/L	<10	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Barium	1.00E+04*	N/A	1	mg/kg	86	70	52	80	82	51	86	128	41	144	76	52	83	49	59	84	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Cadmium	6.53E+02	N/A	0.2	mg/kg	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2	ug/L	<0.2	<0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Cobalt	1.00E+04*	N/A	1	mg/kg	3	4	3	2	4	3	5	6	3	6	4	4	2	2	2	2	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Copper	1.00E+04*	N/A	1	mg/kg	12	3	5	20	11	6	39	24	5	11	3	10	13	2	7	25	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lead	2.29E+03	N/A	1	mg/kg	92	29	46	93	49	50	84	119	49	152	31	58	70	26	45	71	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Manganese	1.00E+04	N/A	1	mg/kg	49	64	35	118	91	32	201	342	83	103	57	72	216	42	89	138	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Mercury	3.84E+01	N/A	0.05#	mg/kg	<0.05	<0.05	0.1	0.09	<0.05	<0.05	0.06	0.08	<0.05	<0.05	<0.05	0.08	0.13	<0.05	0.06	0.17	0.5	ug/L	<0.5	<0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Molybdenum	3.26E+03	N/A	1	mg/kg	<1	<1	1	1	2	1	1	3	4	1	<1	1	1	<1	1	2	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Nickel	1.00E+04*	N/A	1	mg/kg	2	8	3	5	8	3	7	9	3	6	8	4	5	2	4	5	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Tin	1.00E+04*	N/A	1	mg/kg	2	3	1	3	2	1	3	4	1	2	3	2	4	2	2	4	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Zinc	1.00E+04*	N/A	1	mg/kg	68	27	93	218	183	57	242	343	77	56	29	92	166	24	96	225	10	ug/L	26	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Trivalent Chromium	1.00E+04*	N/A	1	mg/kg	10	21	9	20	18	8	18	20	11	18	18	8	13	7	10	15	20	ug/L	<20	<20	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Hexavalent Chromium	1.96E+03	N/A	1	mg/kg	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	20	ug/L	<20	<20	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Polychlorinated Biphenyls (PCBs)	Total Polychlorinated biphenyls	7.48E-01	N/A	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Semi-Volatile Organic Compounds (SVOCs)	Naphthalene	4.53E+02	1.25E+02	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Acenaphthylene	1.00E+04*	1.98E+01	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Acenaphthene	1.00E+04*	6.02E+01	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Fluorene	1.00E+04*	5.47E+01	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Phenanthrene	1.00E+04*	2.80E+01	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Anthracene	1.00E+04*	2.56E+00	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Fluoranthene	1.00E+04*	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Pyrene	1.00E+04*	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Benz(a)anthracene	9.18E+01	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Chrysene	1.14E+03	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Benzo(b)fluoranthene	1.78E+01	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	ug/L	<1	<1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Benzo(k)fluoranthene	9.18E+02	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Benzo(a)pyrene	9.18E+00	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Indeno(1.2.3.cd)pyrene	9.18E+01	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Dibenz(a.h)anthracene	9.18E+00	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Benzo(g.h.i)perylene	1.00E+04*	NA	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2	ug/L	<2	<2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Petroleum Carbon Ranges	C6 – C8 Fraction	1.00E+04*	1.00E+03	5	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	2	ug/L	<20	<20	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C9 – C16 Fraction	1.00E+04*	3.00E+03	200	mg/kg	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	20	ug/L	<500	<500	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	C17 – C35 Fraction	1.00E+04*	5.00E+03	500	mg/kg	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	500	ug/L	<500	<500	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volatile Organic Compounds (VOCs)	Benzene	9.21E+00	3.36E+02	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	5	ug/L	<5	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Toluene	1.00E+04*	2.35E+02	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5	ug/L	<5	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Ethylbenzene	8.24E+03	1.38E+02	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5	ug/L	<5	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Xylenes (Total)	1.23E+03	1.50E+02	2	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	20	ug/L	<20	<20	<20	<20	<20	<20	<20	<20	<20
	2-Propanone (Acetone)	1.00E+04*	***	50	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	500	ug/L	<500	<500	<500	<500	<500	<500	<500	<500	<500
	Trichloroethene	5.68E+00	4.88E+02	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5	ug/L	<5	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Methyl tert-Butyl Ether (MTBE)	7.01E+01	2.38E+03	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5	ug/L	<5	<5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

(#) Reporting Limit of Mercury was smaller than the one stated in the agreed CAP (was 0.2 mg/kg).

(*) Indicates a 'ceiling limit' concentration.

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

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 10
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1717830
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Project	: QUEEN S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS	Quote number	: HK/5386/2016	Date Samples Received	: 02-MAY-2017
Order number	: ----			Issue Date	: 17-MAY-2017
C-O-C number	: ----			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 02-MAY-2017 to 12-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1717830

Project Name: Queen's Hill Development - Sewage Pumping Station Works.

Sample(s) were picked up from client by ALS Technichem (HK) staff in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-02-1 0.5M BGL Client sampling date / time: [29-APR-2017] HK1717830-001	SPS-02-4 0.5M BGL [29-APR-2017] HK1717830-002	SPS-02-1 1.5M BGL [29-APR-2017] HK1717830-003	SPS-02-4 1.5M BGL [29-APR-2017] HK1717830-004
EA/ED: Physical and Aggregate Properties							
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**17.9**	**23.7**	**25.0**	**27.9**
EG: Metals and Major Cations							
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	<1	<1
EG020: Arsenic	7440-38-2	1	mg/kg	**4**	**22**	**21**	**12**
EG020: Barium	7440-39-3	1	mg/kg	**86**	**144**	**70**	**76**
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
EG020: Cobalt	7440-48-4	1	mg/kg	**3**	**6**	**4**	**4**
EG020: Copper	7440-50-8	1	mg/kg	**12**	**11**	**3**	**3**
EG020: Lead	7439-92-1	1	mg/kg	**92**	**152**	**29**	**31**
EG020: Manganese	7439-96-5	1	mg/kg	**49**	**103**	**64**	**57**
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	**1**	<1	<1
EG020: Nickel	7440-02-0	1	mg/kg	**2**	**6**	**8**	**8**
EG020: Tin	7440-31-5	1	mg/kg	**2**	**2**	**3**	**3**
EG020: Zinc	7440-66-6	1	mg/kg	**68**	**56**	**27**	**29**
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**10**	**18**	**21**	**18**
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	<1	<1
EP-066: Polychlorinated Biphenyls							
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)							
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500	<0.500
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)							

Sub-Matrix: SOIL				Client sample ID	SPS-02-1 0.5M BGL	SPS-02-4 0.5M BGL	SPS-02-1 1.5M BGL	SPS-02-4 1.5M BGL	
				Client sampling date / time	[29-APR-2017]	[29-APR-2017]	[29-APR-2017]	[29-APR-2017]	
Compound	CAS Number	LOR	Unit		HK1717830-001	HK1717830-002	HK1717830-003	HK1717830-004	
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) - Continued									
C6 - C8 Fraction	----	5	mg/kg		<5	<5	<5	<5	
C9 - C16 Fraction	----	200	mg/kg		<200	<200	<200	<200	
C17 - C35 Fraction	----	500	mg/kg		<500	<500	<500	<500	
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0	<1.0	<1.0	<1.0	
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	
Xylenes (Total)	----	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	
EP-074_SR-B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	mg/kg		<50	<50	<50	<50	
EP-074_SR-E: Halogenated Aliphatics									
Trichloroethene	79-01-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	
EP-074_SR-I: Methyl-tert-butyl Ether									
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**106**	**94.1**	**101**	**106**	
4-Terphenyl-d14	1718-51-0	0.1	%		**107**	**94.5**	**102**	**105**	
EP-066S: PCB Surrogate									
Tetrachlorometaxylene	877-09-8	0.1	%		**66.2**	**60.8**	**68.4**	**60.8**	
Dibutylchlorendate	1770-80-5	0.1	%		**105**	**102**	**114**	**81.0**	
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
Dibromofluoromethane	1868-53-7	0.1	%		**92.8**	**92.9**	**92.2**	**94.0**	
Toluene-D8	2037-26-5	0.1	%		**106**	**108**	**102**	**103**	
4-Bromofluorobenzene	460-00-4	0.1	%		**96.2**	**99.4**	**99.0**	**97.2**	
EP-074_SR-S: VOC Surrogates									
Dibromofluoromethane	1868-53-7	0.1	%		**92.8**	**92.9**	**92.2**	**94.0**	
Toluene-D8	2037-26-5	0.1	%		**106**	**108**	**102**	**103**	
4-Bromofluorobenzene	460-00-4	0.1	%		**96.2**	**99.4**	**99.0**	**97.2**	

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4478795)								
HK1717830-001	SPS-02-1 0.5M BGL	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	17.9	17.7	0.8
HK1717884-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	16.3	16.8	3.5
EG: Metals and Major Cations (QC Lot: 4479571)								
HK1717830-002	SPS-02-4 0.5M BGL	**EG3060: Hexavalent Chromium**	18540-29-9	1	mg/kg	<1	<1	0.0
EG: Metals and Major Cations (QC Lot: 4479925)								
HK1717830-002	SPS-02-4 0.5M BGL	**EG020: Mercury**	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	22	22	0.0
		EG020: Barium	7440-39-3	1	mg/kg	144	146	1.4
		EG020: Cobalt	7440-48-4	1	mg/kg	6	6	0.0
		EG020: Copper	7440-50-8	1	mg/kg	11	12	0.0
		EG020: Lead	7439-92-1	1	mg/kg	152	138	9.3
		EG020: Manganese	7439-96-5	1	mg/kg	103	92	11.4
		EG020: Molybdenum	7439-98-7	1	mg/kg	1	1	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	6	6	0.0
		EG020: Tin	7440-31-5	1	mg/kg	2	2	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	56	60	5.9
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)								
HK1718100-001	Anonymous	**Total Polychlorinated biphenyls**	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4478078)								
HK1718612-003	Anonymous	**Fluoranthene**	206-44-0	150	µg/kg	<150	<150	0.0
		Pyrene	129-00-0	150	µg/kg	<150	<150	0.0
		Benz(a)anthracene	56-55-3	150	µg/kg	<150	<150	0.0
		Chrysene	218-01-9	150	µg/kg	<150	<150	0.0
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	0.0
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	0.0
		Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	150	µg/kg	<150	<150	0.0
		Dibenz(a.h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g.h.i)perylene	191-24-2	150	µg/kg	<150	<150	0.0
		Naphthalene	91-20-3	50	µg/kg	<50	<50	0.0
		Acenaphthylene	208-96-8	50	µg/kg	<50	<50	0.0
		Acenaphthene	83-32-9	50	µg/kg	<50	<50	0.0
		Fluorene	86-73-7	50	µg/kg	<50	<50	0.0
		Phenanthrene	85-01-8	50	µg/kg	<50	<50	0.0
		Anthracene	120-12-7	50	µg/kg	<50	<50	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)								
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077) - Continued								
HK1717969-001	Anonymous	**C17 - C35 Fraction**	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)								
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4477384)								
HK1718100-001	Anonymous	**Benzene**	71-43-2	0.1	mg/kg	<0.1	<0.1	0.0
		Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	0.0
		Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.0
		ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.0
		meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	<0.4	0.0
		Xylenes (Total)	----	1.0	mg/kg	<1.0	<1.0	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)								
HK1717830-004	SPS-02-4 1.5M BGL	**Benzene**	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4477384)								
HK1718100-001	Anonymous	**2-Propanone (Acetone)**	67-64-1	2	mg/kg	<2	<2	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)								
HK1717830-004	SPS-02-4 1.5M BGL	**2-Propanone (Acetone)**	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4477384)								
HK1718100-001	Anonymous	**Trichloroethene**	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)								
HK1717830-004	SPS-02-4 1.5M BGL	**Trichloroethene**	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4477384)								
HK1718100-001	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.2	mg/kg	<0.2	<0.2	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)								
HK1717830-004	SPS-02-4 1.5M BGL	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4479571)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	101	----	92	122	----	----
EG: Metals and Major Cations (QC Lot: 4479925)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	91.0	----	75	111	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4479925) - Continued											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	81.4	----	75	111	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	95.8	----	79	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	98.0	----	80	108	----	----
EG020: Cobalt	7440-48-4	1	mg/kg	<1	5 mg/kg	95.0	----	74	108	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	95.0	----	79	109	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	100	----	81	107	----	----
EG020: Manganese	7439-96-5	1	mg/kg	<1	5 mg/kg	96.0	----	74	116	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	100	----	74	114	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	91.0	----	78	104	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	96.5	----	74	106	----	----
EG020: Tin	7440-31-5	1	mg/kg	<1	5 mg/kg	105	----	79	109	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	102	----	76	118	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	116	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4478078)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	102	----	54	104	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	500 µg/kg	89.9	----	58	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	500 µg/kg	102	----	57	103	----	----
Fluorene	86-73-7	50	µg/kg	<50	500 µg/kg	105	----	71	114	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	500 µg/kg	105	----	57	113	----	----
Anthracene	120-12-7	50	µg/kg	<50	500 µg/kg	94.6	----	51	98	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	500 µg/kg	104	----	69	119	----	----
Pyrene	129-00-0	50	µg/kg	<50	500 µg/kg	105	----	65	120	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	500 µg/kg	102	----	70	115	----	----
Chrysene	218-01-9	50	µg/kg	<50	500 µg/kg	97.2	----	66	118	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	500 µg/kg	103	----	68	123	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	500 µg/kg	101	----	68	117	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	500 µg/kg	94.1	----	43	125	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	500 µg/kg	104	----	64	118	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	500 µg/kg	105	----	38	131	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	500 µg/kg	106	----	36	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	106	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	97.8	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	93.0	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4477384)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	93.7	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	90.4	----	77	130	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4477384) - Continued											
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	99.3	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	101	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	98.1	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	100	----	77	134	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	93.1	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	96.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	96.0	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	95.1	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	98.4	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.2	----	77	134	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4477384)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	105	----	79	131	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	99.4	----	79	131	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4477384)											
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	92.2	----	79	109	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)											
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	88.6	----	79	109	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4477384)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	90.8	----	77	114	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	98.9	----	77	114	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4479571)										
HK1717830-001	SPS-02-1 0.5M BGL	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	99.0	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4479925)										
HK1717830-001	SPS-02-1 0.5M BGL	**EG020: Antimony**	7440-36-0	5 mg/kg	87.0	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	90.0	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	103	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	104	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	86.0	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	88.8	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	98.0	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	98.8	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	94.0	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)										
HK1718100-003	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	111	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4478078)										
HK1718612-004	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	92.7	----	50	130	----	----
		Acenaphthylene	208-96-8	500 µg/kg	94.8	----	50	130	----	----
		Acenaphthene	83-32-9	500 µg/kg	95.6	----	50	130	----	----
		Fluorene	86-73-7	500 µg/kg	98.5	----	50	130	----	----
		Phenanthrene	85-01-8	500 µg/kg	97.4	----	50	130	----	----
		Anthracene	120-12-7	500 µg/kg	92.6	----	50	130	----	----
		Fluoranthene	206-44-0	500 µg/kg	94.6	----	50	130	----	----
		Pyrene	129-00-0	500 µg/kg	92.8	----	50	130	----	----
		Benz(a)anthracene	56-55-3	500 µg/kg	94.5	----	50	130	----	----
		Chrysene	218-01-9	500 µg/kg	85.2	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	500 µg/kg	93.2	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	500 µg/kg	94.5	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	500 µg/kg	93.8	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	500 µg/kg	92.4	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	500 µg/kg	87.6	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	500 µg/kg	102	----	50	130	----	----

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPD (%): Value	RPD (%): Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4478078) - Continued										
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)										
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.8	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	74.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)										
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	90.3	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 10
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719380
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: QUEEN S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS	Quote number	: HK/5386/2016	Date Samples Received	: 09-MAY-2017
Order number	: ----			Issue Date	: 23-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 09-MAY-2017 to 18-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719380

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: SOIL

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-02-1-4.5M BGL				
				Client sampling date / time: [09-MAY-2017]				
				HK1719380-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	31.7				
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1				
EG020: Arsenic	7440-38-2	1	mg/kg	22				
EG020: Barium	7440-39-3	1	mg/kg	52				
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2				
EG020: Cobalt	7440-48-4	1	mg/kg	3				
EG020: Copper	7440-50-8	1	mg/kg	5				
EG020: Lead	7439-92-1	1	mg/kg	46				
EG020: Manganese	7439-96-5	1	mg/kg	35				
EG020: Mercury	7439-97-6	0.05	mg/kg	0.10				
EG020: Molybdenum	7439-98-7	1	mg/kg	1				
EG020: Nickel	7440-02-0	1	mg/kg	3				
EG020: Tin	7440-31-5	1	mg/kg	1				
EG020: Zinc	7440-66-6	1	mg/kg	93				
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	9				
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1				
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500				
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500				
Acenaphthene	83-32-9	0.500	mg/kg	<0.500				
Fluorene	86-73-7	0.500	mg/kg	<0.500				
Phenanthrene	85-01-8	0.500	mg/kg	<0.500				
Anthracene	120-12-7	0.500	mg/kg	<0.500				
Fluoranthene	206-44-0	0.500	mg/kg	<0.500				
Pyrene	129-00-0	0.500	mg/kg	<0.500				
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500				
Chrysene	218-01-9	0.500	mg/kg	<0.500				
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500				
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500				
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500				
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500				
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500				
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5				

Sub-Matrix: **SOIL**			*Client sample ID*	**SPS-02-1-4.5M BGL**				
			Client sampling date / time	[09-MAY-2017]				
Compound	*CAS Number*	*LOR*	*Unit*	**HK1719380-001**				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) - Continued								
C9 - C16 Fraction	----	200	mg/kg	<200				
C17 - C35 Fraction	----	500	mg/kg	<500				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	0.2	mg/kg	<0.2				
Toluene	108-88-3	0.5	mg/kg	<0.5				
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5				
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0				
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5				
Xylenes (Total)	----	2.0	mg/kg	<2.0				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	50	mg/kg	<50				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	0.1	mg/kg	<0.1				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**92.4**				
4-Terphenyl-d14	1718-51-0	0.1	%	**90.9**				
EP-066S: PCB Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	**66.8**				
Dibutylchlorendate	1770-80-5	0.1	%	**90.4**				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
Dibromofluoromethane	1868-53-7	0.1	%	**93.9**				
Toluene-D8	2037-26-5	0.1	%	**97.8**				
4-Bromofluorobenzene	460-00-4	0.1	%	**96.5**				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**93.9**				
Toluene-D8	2037-26-5	0.1	%	**97.8**				
4-Bromofluorobenzene	460-00-4	0.1	%	**96.5**				

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4481761)								
HK1719230-006	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	13.7	13.8	0.8
HK1719363-003	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	23.0	23.2	0.8
EG: Metals and Major Cations (QC Lot: 4479565)								
HK1719315-019	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.13	0.13	0.0
		EG020: Cadmium	7440-43-9	0.1	mg/kg	0.2	0.2	0.0
		EG020: Barium	7440-39-3	0.5	mg/kg	55.0	56.4	2.6
		EG020: Cobalt	7440-48-4	0.5	mg/kg	3.3	3.3	0.0
		EG020: Manganese	7439-96-5	0.5	mg/kg	582	568	2.4
		EG020: Tin	7440-31-5	0.5	mg/kg	3.6	3.0	18.0
		EG020: Antimony	7440-36-0	1	mg/kg	2	1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	8	7	0.0
		EG020: Copper	7440-50-8	1	mg/kg	32	30	6.6
		EG020: Lead	7439-92-1	1	mg/kg	44	44	0.0
		EG020: Molybdenum	7439-98-7	1	mg/kg	2	2	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	3	3	0.0
		EG020: Zinc	7440-66-6	10	mg/kg	79	81	3.1
HK1719321-008	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0
		EG020: Barium	7440-39-3	0.5	mg/kg	4.0	3.8	6.2
		EG020: Cobalt	7440-48-4	0.5	mg/kg	2.3	2.5	6.8
		EG020: Manganese	7439-96-5	0.5	mg/kg	88.8	102	14.3
		EG020: Tin	7440-31-5	0.5	mg/kg	0.5	<0.5	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	4	4	0.0
		EG020: Copper	7440-50-8	1	mg/kg	2	1	0.0
		EG020: Lead	7439-92-1	1	mg/kg	6	5	0.0
		EG020: Molybdenum	7439-98-7	1	mg/kg	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	5	4	0.0
		EG020: Zinc	7440-66-6	10	mg/kg	15	15	0.0
EG: Metals and Major Cations (QC Lot: 4479571)								
HK1717830-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)								
HK1718100-001	Anonymous	Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569)								
HK1719380-001	SPS-02-1-4.5M BGL	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569) - Continued								
HK1719380-001	SPS-02-1-4.5M BGL	**Anthracene**	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)								
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)								
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Benzene**	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)								
HK1717830-004	Anonymous	**2-Propanone (Acetone)**	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Trichloroethene**	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4479565)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	90.1	----	75	111	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	104	----	75	111	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	95.8	----	79	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	96.1	----	80	108	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4479565) - Continued											
EG020: Cobalt	7440-48-4	1	mg/kg	<1	5 mg/kg	101	----	74	108	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	101	----	79	109	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	95.7	----	81	107	----	----
EG020: Manganese	7439-96-5	1	mg/kg	<1	5 mg/kg	100	----	74	116	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	103	----	74	114	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	89.6	----	78	104	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	100	----	74	106	----	----
EG020: Tin	7440-31-5	1	mg/kg	<1	5 mg/kg	92.0	----	79	109	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	107	----	76	118	----	----
EG: Metals and Major Cations (QC Lot: 4479571)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	101	----	92	122	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	116	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	102	----	54	104	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	500 µg/kg	91.1	----	58	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	500 µg/kg	101	----	57	103	----	----
Fluorene	86-73-7	50	µg/kg	<50	500 µg/kg	103	----	71	114	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	500 µg/kg	101	----	57	113	----	----
Anthracene	120-12-7	50	µg/kg	<50	500 µg/kg	92.2	----	51	98	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	500 µg/kg	104	----	69	119	----	----
Pyrene	129-00-0	50	µg/kg	<50	500 µg/kg	103	----	65	120	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	500 µg/kg	101	----	70	115	----	----
Chrysene	218-01-9	50	µg/kg	<50	500 µg/kg	93.6	----	66	118	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	500 µg/kg	96.3	----	68	123	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	500 µg/kg	95.3	----	68	117	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	500 µg/kg	90.8	----	43	125	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	500 µg/kg	102	----	64	118	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	500 µg/kg	101	----	38	131	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	500 µg/kg	105	----	36	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	106	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	97.8	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	93.0	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	93.1	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	96.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	96.0	----	77	128	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769) - Continued											
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	95.1	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	98.4	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.2	----	77	134	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	99.4	----	79	131	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)											
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	88.6	----	79	109	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	98.9	----	77	114	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4479565)										
HK1719315-018	Anonymous	**EG020: Antimony**	7440-36-0	5 mg/kg	91.3	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	101	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	89.2	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	111	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	96.0	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	86.2	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	115	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	83.6	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4479571)										
HK1717830-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	99.0	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)										
HK1718100-003	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	111	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569)										
HK1719410-001	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	99.9	----	50	130	----	----
		Acenaphthylene	208-96-8	500 µg/kg	100	----	50	130	----	----
		Acenaphthene	83-32-9	500 µg/kg	96.3	----	50	130	----	----
		Fluorene	86-73-7	500 µg/kg	95.9	----	50	130	----	----
		Phenanthrene	85-01-8	500 µg/kg	108	----	50	130	----	----
		Anthracene	120-12-7	500 µg/kg	95.4	----	50	130	----	----
		Fluoranthene	206-44-0	500 µg/kg	104	----	50	130	----	----
		Pyrene	129-00-0	500 µg/kg	106	----	50	130	----	----
		Benz(a)anthracene	56-55-3	500 µg/kg	104	----	50	130	----	----
		Chrysene	218-01-9	500 µg/kg	103	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	500 µg/kg	104	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	500 µg/kg	88.2	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	500 µg/kg	103	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	500 µg/kg	86.2	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	500 µg/kg	77.5	----	50	130	----	----

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPD (%): Value	RPD (%): Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569) - Continued										
HK1719410-001	Anonymous	**Benzo(g.h.i)perylene**	191-24-2	500 µg/kg	80.1	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)										
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.8	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	74.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)										
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	90.3	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 10
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719410
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: QUEEN S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS	Quote number	: HK/5386/2016	Date Samples Received	: 10-MAY-2017
Order number	: ----			Issue Date	: 23-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 10-MAY-2017 to 18-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719410

Sample(s) were received in ambient condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: SOIL

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-02-4 4.5M BGL				
				Client sampling date / time: [10-MAY-2017]				
				HK1719410-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**20.3**				
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1				
EG020: Arsenic	7440-38-2	1	mg/kg	**13**				
EG020: Barium	7440-39-3	1	mg/kg	**52**				
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2				
EG020: Cobalt	7440-48-4	1	mg/kg	**4**				
EG020: Copper	7440-50-8	1	mg/kg	**10**				
EG020: Lead	7439-92-1	1	mg/kg	**58**				
EG020: Manganese	7439-96-5	1	mg/kg	**72**				
EG020: Mercury	7439-97-6	0.05	mg/kg	**0.08**				
EG020: Molybdenum	7439-98-7	1	mg/kg	**1**				
EG020: Nickel	7440-02-0	1	mg/kg	**4**				
EG020: Tin	7440-31-5	1	mg/kg	**2**				
EG020: Zinc	7440-66-6	1	mg/kg	**92**				
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**8**				
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1				
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500				
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500				
Acenaphthene	83-32-9	0.500	mg/kg	<0.500				
Fluorene	86-73-7	0.500	mg/kg	<0.500				
Phenanthrene	85-01-8	0.500	mg/kg	<0.500				
Anthracene	120-12-7	0.500	mg/kg	<0.500				
Fluoranthene	206-44-0	0.500	mg/kg	<0.500				
Pyrene	129-00-0	0.500	mg/kg	<0.500				
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500				
Chrysene	218-01-9	0.500	mg/kg	<0.500				
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500				
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500				
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500				
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500				
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500				
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5				

Sub-Matrix: **SOIL**				*Client sample ID*	**SPS-02-4 4.5M BGL**				
				Client sampling date / time	[10-MAY-2017]				
Compound	*CAS Number*	*LOR*	*Unit*		**HK1719410-001**				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) - Continued									
C9 - C16 Fraction	----	200	mg/kg		<200				
C17 - C35 Fraction	----	500	mg/kg		<500				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	0.2	mg/kg		<0.2				
Toluene	108-88-3	0.5	mg/kg		<0.5				
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5				
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0				
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5				
Xylenes (Total)	----	2.0	mg/kg		<2.0				
EP-074_SR-B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	mg/kg		<50				
EP-074_SR-E: Halogenated Aliphatics									
Trichloroethene	79-01-6	0.1	mg/kg		<0.1				
EP-074_SR-I: Methyl-tert-butyl Ether									
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg		<0.5				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**104**				
4-Terphenyl-d14	1718-51-0	0.1	%		**98.6**				
EP-066S: PCB Surrogate									
Tetrachlorometaxylene	877-09-8	0.1	%		**84.6**				
Dibutylchlorendate	1770-80-5	0.1	%		**123**				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
Dibromofluoromethane	1868-53-7	0.1	%		**90.6**				
Toluene-D8	2037-26-5	0.1	%		**106**				
4-Bromofluorobenzene	460-00-4	0.1	%		**98.4**				
EP-074_SR-S: VOC Surrogates									
Dibromofluoromethane	1868-53-7	0.1	%		**90.6**				
Toluene-D8	2037-26-5	0.1	%		**106**				
4-Bromofluorobenzene	460-00-4	0.1	%		**98.4**				

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4481761)								
HK1719230-006	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	13.7	13.8	0.8
HK1719363-003	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	23.0	23.2	0.8
EG: Metals and Major Cations (QC Lot: 4479565)								
HK1719315-019	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.13	0.13	0.0
		EG020: Cadmium	7440-43-9	0.1	mg/kg	0.2	0.2	0.0
		EG020: Barium	7440-39-3	0.5	mg/kg	55.0	56.4	2.6
		EG020: Cobalt	7440-48-4	0.5	mg/kg	3.3	3.3	0.0
		EG020: Manganese	7439-96-5	0.5	mg/kg	582	568	2.4
		EG020: Tin	7440-31-5	0.5	mg/kg	3.6	3.0	18.0
		EG020: Antimony	7440-36-0	1	mg/kg	2	1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	8	7	0.0
		EG020: Copper	7440-50-8	1	mg/kg	32	30	6.6
		EG020: Lead	7439-92-1	1	mg/kg	44	44	0.0
		EG020: Molybdenum	7439-98-7	1	mg/kg	2	2	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	3	3	0.0
		EG020: Zinc	7440-66-6	10	mg/kg	79	81	3.1
HK1719321-008	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.1	mg/kg	<0.1	<0.1	0.0
		EG020: Barium	7440-39-3	0.5	mg/kg	4.0	3.8	6.2
		EG020: Cobalt	7440-48-4	0.5	mg/kg	2.3	2.5	6.8
		EG020: Manganese	7439-96-5	0.5	mg/kg	88.8	102	14.3
		EG020: Tin	7440-31-5	0.5	mg/kg	0.5	<0.5	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	4	4	0.0
		EG020: Copper	7440-50-8	1	mg/kg	2	1	0.0
		EG020: Lead	7439-92-1	1	mg/kg	6	5	0.0
		EG020: Molybdenum	7439-98-7	1	mg/kg	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	5	4	0.0
		EG020: Zinc	7440-66-6	10	mg/kg	15	15	0.0
EG: Metals and Major Cations (QC Lot: 4479571)								
HK1717830-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)								
HK1718100-001	Anonymous	Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569)								
HK1719380-001	Anonymous	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569) - Continued								
HK1719380-001	Anonymous	**Anthracene**	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)								
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)								
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Benzene**	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)								
HK1717830-004	Anonymous	**2-Propanone (Acetone)**	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Trichloroethene**	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4479565)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	90.1	----	75	111	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	104	----	75	111	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	95.8	----	79	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	96.1	----	80	108	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4479565) - Continued											
EG020: Cobalt	7440-48-4	1	mg/kg	<1	5 mg/kg	101	----	74	108	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	101	----	79	109	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	95.7	----	81	107	----	----
EG020: Manganese	7439-96-5	1	mg/kg	<1	5 mg/kg	100	----	74	116	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	103	----	74	114	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	89.6	----	78	104	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	100	----	74	106	----	----
EG020: Tin	7440-31-5	1	mg/kg	<1	5 mg/kg	92.0	----	79	109	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	107	----	76	118	----	----
EG: Metals and Major Cations (QC Lot: 4479571)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	101	----	92	122	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	116	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	102	----	54	104	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	500 µg/kg	91.1	----	58	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	500 µg/kg	101	----	57	103	----	----
Fluorene	86-73-7	50	µg/kg	<50	500 µg/kg	103	----	71	114	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	500 µg/kg	101	----	57	113	----	----
Anthracene	120-12-7	50	µg/kg	<50	500 µg/kg	92.2	----	51	98	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	500 µg/kg	104	----	69	119	----	----
Pyrene	129-00-0	50	µg/kg	<50	500 µg/kg	103	----	65	120	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	500 µg/kg	101	----	70	115	----	----
Chrysene	218-01-9	50	µg/kg	<50	500 µg/kg	93.6	----	66	118	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	500 µg/kg	96.3	----	68	123	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	500 µg/kg	95.3	----	68	117	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	500 µg/kg	90.8	----	43	125	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	500 µg/kg	102	----	64	118	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	500 µg/kg	101	----	38	131	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	500 µg/kg	105	----	36	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	106	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	97.8	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	93.0	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	93.1	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	96.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	96.0	----	77	128	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769) - Continued											
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	95.1	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	98.4	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.2	----	77	134	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	99.4	----	79	131	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)											
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	88.6	----	79	109	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	98.9	----	77	114	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4479565)										
HK1719315-018	Anonymous	**EG020: Antimony**	7440-36-0	5 mg/kg	91.3	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	101	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	89.2	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	111	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	96.0	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	86.2	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	115	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	83.6	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4479571)										
HK1717830-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	99.0	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)										
HK1718100-003	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	111	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569)										
HK1719410-001	SPS-02-4 4.5M BGL	**Naphthalene**	91-20-3	500 µg/kg	99.9	----	50	130	----	----
		Acenaphthylene	208-96-8	500 µg/kg	100	----	50	130	----	----
		Acenaphthene	83-32-9	500 µg/kg	96.3	----	50	130	----	----
		Fluorene	86-73-7	500 µg/kg	95.9	----	50	130	----	----
		Phenanthrene	85-01-8	500 µg/kg	108	----	50	130	----	----
		Anthracene	120-12-7	500 µg/kg	95.4	----	50	130	----	----
		Fluoranthene	206-44-0	500 µg/kg	104	----	50	130	----	----
		Pyrene	129-00-0	500 µg/kg	106	----	50	130	----	----
		Benz(a)anthracene	56-55-3	500 µg/kg	104	----	50	130	----	----
		Chrysene	218-01-9	500 µg/kg	103	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	500 µg/kg	104	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	500 µg/kg	88.2	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	500 µg/kg	103	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	500 µg/kg	86.2	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	500 µg/kg	77.5	----	50	130	----	----

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPD (%): Value	RPD (%): Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4479569) - Continued										
HK1719410-001	SPS-02-4 4.5M BGL	**Benzo(g.h.i)perylene**	191-24-2	500 µg/kg	80.1	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)										
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.8	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	74.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)										
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	90.3	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 11
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719575
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORK	Quote number	: HK/5386/2016	Date Samples Received	: 11-MAY-2017
Order number	: ----			Issue Date	: 23-MAY-2017
C-O-C number	: ----			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 3

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 11-MAY-2017 to 22-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719575

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-02-2 0.5M BGL Client sampling date / time: [11-MAY-2017] HK1719575-001	SPS-02-2 1.5M BGL [11-MAY-2017] HK1719575-002	SPS-02-2 4.5M BGL [11-MAY-2017] HK1719575-004		
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**14.5**	**20.5**	**28.1**		
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	<1		
EG020: Arsenic	7440-38-2	1	mg/kg	**8**	**18**	**11**		
EG020: Barium	7440-39-3	1	mg/kg	**80**	**82**	**51**		
EG020: Cadmium	7440-43-9	0.2	mg/kg	**0.2**	<0.2	<0.2		
EG020: Cobalt	7440-48-4	1	mg/kg	**2**	**4**	**3**		
EG020: Copper	7440-50-8	1	mg/kg	**20**	**11**	**6**		
EG020: Lead	7439-92-1	1	mg/kg	**93**	**49**	**50**		
EG020: Manganese	7439-96-5	1	mg/kg	**118**	**91**	**32**		
EG020: Mercury	7439-97-6	0.05	mg/kg	**0.09**	<0.05	<0.05		
EG020: Molybdenum	7439-98-7	1	mg/kg	**1**	**2**	**1**		
EG020: Nickel	7440-02-0	1	mg/kg	**5**	**8**	**3**		
EG020: Tin	7440-31-5	1	mg/kg	**3**	**2**	**1**		
EG020: Zinc	7440-66-6	1	mg/kg	**218**	**183**	**57**		
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**20**	**18**	**8**		
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	<1		
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1		
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500		
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500		
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500		
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500		
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500		
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500		
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5		

Sub-Matrix: **SOIL**				*Client sample ID*	**SPS-02-2 0.5M BGL**	**SPS-02-2 1.5M BGL**	**SPS-02-2 4.5M BGL**		
				Client sampling date / time	[11-MAY-2017]	[11-MAY-2017]	[11-MAY-2017]		
Compound	*CAS Number*	*LOR*	*Unit*		**HK1719575-001**	**HK1719575-002**	**HK1719575-004**		
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) - Continued									
C9 - C16 Fraction	----	200	mg/kg		<200	<200	<200		
C17 - C35 Fraction	----	500	mg/kg		<500	<500	<500		
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2		
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5		
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5		
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0	<1.0	<1.0		
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5		
Xylenes (Total)	----	2.0	mg/kg		<2.0	<2.0	<2.0		
EP-074_SR-B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	mg/kg		<50	<50	<50		
EP-074_SR-E: Halogenated Aliphatics									
Trichloroethene	79-01-6	0.1	mg/kg		<0.1	<0.1	<0.1		
EP-074_SR-I: Methyl-tert-butyl Ether									
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg		<0.5	<0.5	<0.5		
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**103**	**97.9**	**99.4**		
4-Terphenyl-d14	1718-51-0	0.1	%		**105**	**99.2**	**100**		
EP-066S: PCB Surrogate									
Tetrachlorometaxylene	877-09-8	0.1	%		**55.0**	**54.8**	**56.2**		
Dibutylchlorendate	1770-80-5	0.1	%		**118**	**121**	**120**		
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
Dibromofluoromethane	1868-53-7	0.1	%		**91.0**	**89.8**	**93.3**		
Toluene-D8	2037-26-5	0.1	%		**106**	**110**	**112**		
4-Bromofluorobenzene	460-00-4	0.1	%		**101**	**100**	**101**		
EP-074_SR-S: VOC Surrogates									
Dibromofluoromethane	1868-53-7	0.1	%		**91.0**	**89.8**	**93.3**		
Toluene-D8	2037-26-5	0.1	%		**106**	**110**	**112**		
4-Bromofluorobenzene	460-00-4	0.1	%		**101**	**100**	**101**		

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4484095)								
HK1719573-004	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	28.8	28.6	0.8
HK1719597-002	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.1	17.3	7.0
EG: Metals and Major Cations (QC Lot: 4481319)								
HK1719573-002	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.08	0.09	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.4	0.3	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	1	1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	21	19	9.1
		EG020: Barium	7440-39-3	1	mg/kg	128	126	2.3
		EG020: Cobalt	7440-48-4	1	mg/kg	6	5	0.0
		EG020: Copper	7440-50-8	1	mg/kg	24	27	9.4
		EG020: Lead	7439-92-1	1	mg/kg	119	120	1.2
		EG020: Manganese	7439-96-5	1	mg/kg	342	342	0.0
		EG020: Molybdenum	7439-98-7	1	mg/kg	3	2	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	9	8	0.0
		EG020: Tin	7440-31-5	1	mg/kg	4	4	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	343	350	2.0
EG: Metals and Major Cations (QC Lot: 4483474)								
HK1719502-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
HK1720014-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4481488)								
HK1717969-001	Anonymous	Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566)								
HK1719502-001	Anonymous	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4481498)								

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4481498) - Continued								
HK1719575-001	SPS-02-2 0.5M BGL	**Naphthalene**	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)								
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)								
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481497)								
HK1719575-001	SPS-02-2 0.5M BGL	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481502)								
HK1719575-001	SPS-02-2 0.5M BGL	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Benzene**	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)								
HK1717830-004	Anonymous	**2-Propanone (Acetone)**	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Trichloroethene**	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4481319)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	86.8	----	75	111	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	99.3	----	75	111	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	90.0	----	79	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	92.8	----	80	108	----	----
EG020: Cobalt	7440-48-4	1	mg/kg	<1	5 mg/kg	101	----	74	108	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	107	----	79	109	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	96.3	----	81	107	----	----
EG020: Manganese	7439-96-5	1	mg/kg	<1	5 mg/kg	104	----	74	116	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	90.6	----	74	114	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	88.0	----	78	104	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	103	----	74	106	----	----
EG020: Tin	7440-31-5	1	mg/kg	<1	5 mg/kg	89.2	----	79	109	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	101	----	76	118	----	----
EG: Metals and Major Cations (QC Lot: 4483474)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	92.0	----	92	122	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4481488)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	109	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	102	----	54	104	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	500 µg/kg	94.3	----	58	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	500 µg/kg	100	----	57	103	----	----
Fluorene	86-73-7	50	µg/kg	<50	500 µg/kg	104	----	71	114	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	500 µg/kg	104	----	57	113	----	----
Anthracene	120-12-7	50	µg/kg	<50	500 µg/kg	94.1	----	51	98	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	500 µg/kg	101	----	69	119	----	----
Pyrene	129-00-0	50	µg/kg	<50	500 µg/kg	100	----	65	120	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	500 µg/kg	104	----	70	115	----	----
Chrysene	218-01-9	50	µg/kg	<50	500 µg/kg	99.5	----	66	118	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	500 µg/kg	100	----	68	123	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	500 µg/kg	100	----	68	117	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	500 µg/kg	90.4	----	43	125	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	500 µg/kg	96.8	----	64	118	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	500 µg/kg	95.0	----	38	131	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	500 µg/kg	95.1	----	36	131	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4481498)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	89.3	----	54	104	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	500 µg/kg	78.7	----	58	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	500 µg/kg	95.8	----	57	103	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4481498) - Continued											
Fluorene	86-73-7	50	µg/kg	<50	500 µg/kg	102	----	71	114	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	500 µg/kg	108	----	57	113	----	----
Anthracene	120-12-7	50	µg/kg	<50	500 µg/kg	81.2	----	51	98	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	500 µg/kg	105	----	69	119	----	----
Pyrene	129-00-0	50	µg/kg	<50	500 µg/kg	104	----	65	120	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	500 µg/kg	104	----	70	115	----	----
Chrysene	218-01-9	50	µg/kg	<50	500 µg/kg	94.7	----	66	118	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	500 µg/kg	100	----	68	123	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	500 µg/kg	102	----	68	117	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	500 µg/kg	79.4	----	43	125	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	500 µg/kg	90.6	----	64	118	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	500 µg/kg	87.2	----	38	131	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	500 µg/kg	81.3	----	36	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	106	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	97.8	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	93.0	----	77	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481497)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	84.8	----	69	117	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	77.7	----	51	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481502)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	91.6	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	93.1	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	96.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	96.0	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	95.1	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	98.4	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.2	----	77	134	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	99.4	----	79	131	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)											
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	88.6	----	79	109	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	98.9	----	77	114	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4481319)										
HK1719573-001	Anonymous	**EG020: Antimony**	7440-36-0	5 mg/kg	85.7	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	98.4	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	101	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	101	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	90.8	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	92.7	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	95.8	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	90.6	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4483474)										
HK1719502-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	86.0	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4481488)										
HK1717969-001	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	111	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566)										
HK1719502-002	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	92.6	----	50	130	----	----
		Acenaphthylene	208-96-8	500 µg/kg	102	----	50	130	----	----
		Acenaphthene	83-32-9	500 µg/kg	100	----	50	130	----	----
		Fluorene	86-73-7	500 µg/kg	102	----	50	130	----	----
		Phenanthrene	85-01-8	500 µg/kg	103	----	50	130	----	----
		Anthracene	120-12-7	500 µg/kg	100	----	50	130	----	----
		Fluoranthene	206-44-0	500 µg/kg	98.7	----	50	130	----	----
		Pyrene	129-00-0	500 µg/kg	98.3	----	50	130	----	----
		Benz(a)anthracene	56-55-3	500 µg/kg	101	----	50	130	----	----
		Chrysene	218-01-9	500 µg/kg	94.0	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	500 µg/kg	92.9	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	500 µg/kg	97.8	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	500 µg/kg	101	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	500 µg/kg	89.5	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	500 µg/kg	88.4	----	50	130	----	----

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPD (%): Value	RPD (%): Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566) - Continued										
HK1719502-002	Anonymous	**Benzo(g.h.i)perylene**	191-24-2	500 µg/kg	97.8	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4481498)										
HK1719575-004	SPS-02-2 4.5M BGL	**Naphthalene**	91-20-3	500 µg/kg	101	----	50	130	----	----
		Acenaphthylene	208-96-8	500 µg/kg	101	----	50	130	----	----
		Acenaphthene	83-32-9	500 µg/kg	102	----	50	130	----	----
		Fluorene	86-73-7	500 µg/kg	102	----	50	130	----	----
		Phenanthrene	85-01-8	500 µg/kg	104	----	50	130	----	----
		Anthracene	120-12-7	500 µg/kg	79.8	----	50	130	----	----
		Fluoranthene	206-44-0	500 µg/kg	99.9	----	50	130	----	----
		Pyrene	129-00-0	500 µg/kg	99.8	----	50	130	----	----
		Benz(a)anthracene	56-55-3	500 µg/kg	99.8	----	50	130	----	----
		Chrysene	218-01-9	500 µg/kg	92.0	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	500 µg/kg	102	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	500 µg/kg	98.0	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	500 µg/kg	73.6	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	500 µg/kg	84.2	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	500 µg/kg	81.1	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	500 µg/kg	75.1	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)										
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.8	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	74.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)										
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	90.3	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481497)										
HK1719575-002	SPS-02-2 1.5M BGL	**C9 - C16 Fraction**	----	31.5 mg/kg	71.3	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	60.0	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481502)										
HK1719575-002	SPS-02-2 1.5M BGL	**C6 - C8 Fraction**	----	4.5 mg/kg	92.6	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130

Sub-Matrix: **SOIL**

Compound	*CAS Number*	*Recovery Limits (%)* *Low*	*High*
EP-066S: PCB Surrogate - Continued			
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 10
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719573
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Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORK	Quote number	: HK/5386/2016	Date Samples Received	: 11-MAY-2017
Order number	: ----			Issue Date	: 22-MAY-2017
C-O-C number	: ----			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 3

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 11-MAY-2017 to 22-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719573

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-02-3 0.5M BGL Client sampling date / time: [11-MAY-2017] HK1719573-001	SPS-02-3 1.5M BGL [11-MAY-2017] HK1719573-002	SPS-02-3 4.5M BGL [11-MAY-2017] HK1719573-004		
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**18.6**	**20.8**	**28.8**		
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	**1**	**1**	**1**		
EG020: Arsenic	7440-38-2	1	mg/kg	**9**	**21**	**45**		
EG020: Barium	7440-39-3	1	mg/kg	**86**	**128**	**41**		
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	**0.4**	<0.2		
EG020: Cobalt	7440-48-4	1	mg/kg	**5**	**6**	**3**		
EG020: Copper	7440-50-8	1	mg/kg	**39**	**24**	**5**		
EG020: Lead	7439-92-1	1	mg/kg	**84**	**119**	**49**		
EG020: Manganese	7439-96-5	1	mg/kg	**201**	**342**	**83**		
EG020: Mercury	7439-97-6	0.05	mg/kg	**0.06**	**0.08**	<0.05		
EG020: Molybdenum	7439-98-7	1	mg/kg	**1**	**3**	**4**		
EG020: Nickel	7440-02-0	1	mg/kg	**7**	**9**	**3**		
EG020: Tin	7440-31-5	1	mg/kg	**3**	**4**	**1**		
EG020: Zinc	7440-66-6	1	mg/kg	**242**	**343**	**77**		
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**18**	**20**	**11**		
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	<1		
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	**0.2**	<0.1	<0.1		
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500		
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500		
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500		
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500		
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500		
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500		
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5		

Sub-Matrix: **SOIL**				*Client sample ID*	**SPS-02-3 0.5M BGL**	**SPS-02-3 1.5M BGL**	**SPS-02-3 4.5M BGL**		
				Client sampling date / time	[11-MAY-2017]	[11-MAY-2017]	[11-MAY-2017]		
Compound	*CAS Number*	*LOR*	*Unit*		**HK1719573-001**	**HK1719573-002**	**HK1719573-004**		
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) - Continued									
C9 - C16 Fraction	----	200	mg/kg		<200	<200	<200		
C17 - C35 Fraction	----	500	mg/kg		<500	<500	<500		
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2		
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5		
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5		
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0	<1.0	<1.0		
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5		
Xylenes (Total)	----	2.0	mg/kg		<2.0	<2.0	<2.0		
EP-074_SR-B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	mg/kg		<50	<50	<50		
EP-074_SR-E: Halogenated Aliphatics									
Trichloroethene	79-01-6	0.1	mg/kg		<0.1	<0.1	<0.1		
EP-074_SR-I: Methyl-tert-butyl Ether									
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg		<0.5	<0.5	<0.5		
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**105**	**102**	**105**		
4-Terphenyl-d14	1718-51-0	0.1	%		**101**	**102**	**98.8**		
EP-066S: PCB Surrogate									
Tetrachlorometaxylene	877-09-8	0.1	%		**54.6**	**54.2**	**58.8**		
Dibutylchlorendate	1770-80-5	0.1	%		**116**	**110**	**121**		
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
Dibromofluoromethane	1868-53-7	0.1	%		**90.3**	**93.8**	**90.3**		
Toluene-D8	2037-26-5	0.1	%		**96.3**	**109**	**104**		
4-Bromofluorobenzene	460-00-4	0.1	%		**98.0**	**99.5**	**99.6**		
EP-074_SR-S: VOC Surrogates									
Dibromofluoromethane	1868-53-7	0.1	%		**90.3**	**93.8**	**90.3**		
Toluene-D8	2037-26-5	0.1	%		**96.3**	**109**	**104**		
4-Bromofluorobenzene	460-00-4	0.1	%		**98.0**	**99.5**	**99.6**		

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4484094)								
HK1719248-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	15.7	15.8	1.0
HK1719448-001	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	10.8	11.2	4.0
EA/ED: Physical and Aggregate Properties (QC Lot: 4484095)								
HK1719573-004	SPS-02-3 4.5M BGL	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	28.8	28.6	0.8
HK1719597-002	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	16.1	17.3	7.0
EG: Metals and Major Cations (QC Lot: 4481319)								
HK1719573-002	SPS-02-3 1.5M BGL	**EG020: Mercury**	7439-97-6	0.05	mg/kg	0.08	0.09	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.4	0.3	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	1	1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	21	19	9.1
		EG020: Barium	7440-39-3	1	mg/kg	128	126	2.3
		EG020: Cobalt	7440-48-4	1	mg/kg	6	5	0.0
		EG020: Copper	7440-50-8	1	mg/kg	24	27	9.4
		EG020: Lead	7439-92-1	1	mg/kg	119	120	1.2
		EG020: Manganese	7439-96-5	1	mg/kg	342	342	0.0
		EG020: Molybdenum	7439-98-7	1	mg/kg	3	2	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	9	8	0.0
		EG020: Tin	7440-31-5	1	mg/kg	4	4	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	343	350	2.0
EG: Metals and Major Cations (QC Lot: 4483474)								
HK1719502-002	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	1	mg/kg	<1	<1	0.0
HK1720014-002	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	1	mg/kg	<1	<1	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4481488)								
HK1717969-001	Anonymous	**Total Polychlorinated biphenyls**	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566)								
HK1719502-001	Anonymous	**Naphthalene**	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566) - Continued								
HK1719502-001	Anonymous	**Dibenz(a.h)anthracene**	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)								
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)								
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Benzene**	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)								
HK1717830-004	Anonymous	**2-Propanone (Acetone)**	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Trichloroethene**	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4481319)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	86.8	----	75	111	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	99.3	----	75	111	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	90.0	----	79	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	92.8	----	80	108	----	----
EG020: Cobalt	7440-48-4	1	mg/kg	<1	5 mg/kg	101	----	74	108	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	107	----	79	109	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	96.3	----	81	107	----	----
EG020: Manganese	7439-96-5	1	mg/kg	<1	5 mg/kg	104	----	74	116	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	90.6	----	74	114	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	88.0	----	78	104	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	103	----	74	106	----	----
EG020: Tin	7440-31-5	1	mg/kg	<1	5 mg/kg	89.2	----	79	109	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	101	----	76	118	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4483474)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	92.0	----	92	122	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4481488)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	109	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	102	----	54	104	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	500 µg/kg	94.3	----	58	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	500 µg/kg	100	----	57	103	----	----
Fluorene	86-73-7	50	µg/kg	<50	500 µg/kg	104	----	71	114	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	500 µg/kg	104	----	57	113	----	----
Anthracene	120-12-7	50	µg/kg	<50	500 µg/kg	94.1	----	51	98	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	500 µg/kg	101	----	69	119	----	----
Pyrene	129-00-0	50	µg/kg	<50	500 µg/kg	100	----	65	120	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	500 µg/kg	104	----	70	115	----	----
Chrysene	218-01-9	50	µg/kg	<50	500 µg/kg	99.5	----	66	118	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	500 µg/kg	100	----	68	123	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	500 µg/kg	100	----	68	117	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	500 µg/kg	90.4	----	43	125	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	500 µg/kg	96.8	----	64	118	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	500 µg/kg	95.0	----	38	131	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	500 µg/kg	95.1	----	36	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	106	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	97.8	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	93.0	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	93.1	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	96.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	96.0	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	95.1	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	98.4	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.2	----	77	134	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	99.4	----	79	131	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)											
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	88.6	----	79	109	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	98.9	----	77	114	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4481319)										
HK1719573-001	SPS-02-3 0.5M BGL	**EG020: Antimony**	7440-36-0	5 mg/kg	85.7	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	98.4	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	101	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	101	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	90.8	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	92.7	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	95.8	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	90.6	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4483474)										
HK1719502-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	86.0	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4481488)										
HK1717969-001	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	111	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566)										
HK1719502-002	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	92.6	----	50	130	----	----
		Acenaphthylene	208-96-8	500 µg/kg	102	----	50	130	----	----
		Acenaphthene	83-32-9	500 µg/kg	100	----	50	130	----	----
		Fluorene	86-73-7	500 µg/kg	102	----	50	130	----	----
		Phenanthrene	85-01-8	500 µg/kg	103	----	50	130	----	----
		Anthracene	120-12-7	500 µg/kg	100	----	50	130	----	----
		Fluoranthene	206-44-0	500 µg/kg	98.7	----	50	130	----	----
		Pyrene	129-00-0	500 µg/kg	98.3	----	50	130	----	----
		Benz(a)anthracene	56-55-3	500 µg/kg	101	----	50	130	----	----
		Chrysene	218-01-9	500 µg/kg	94.0	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	500 µg/kg	92.9	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	500 µg/kg	97.8	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	500 µg/kg	101	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	500 µg/kg	89.5	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	500 µg/kg	88.4	----	50	130	----	----

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPD (%): Value	RPD (%): Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566) - Continued										
HK1719502-002	Anonymous	**Benzo(g.h.i)perylene**	191-24-2	500 µg/kg	97.8	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)										
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.8	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	74.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)										
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	90.3	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 9
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719576
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Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORK	Quote number	: HK/5386/2016	Date Samples Received	: 11-MAY-2017
Order number	: ----			Issue Date	: 22-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 11-MAY-2017 to 22-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719576

Site Name: Queen's Hill Development - Sewage Pumping Station Works.

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: DUPLICATE SAMPLE 2				
				Client sampling date / time: [11-MAY-2017]				
				HK1719576-001				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**15.6**				
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	<1				
EG020: Arsenic	7440-38-2	1	mg/kg	**11**				
EG020: Barium	7440-39-3	1	mg/kg	**84**				
EG020: Cadmium	7440-43-9	0.2	mg/kg	**0.2**				
EG020: Cobalt	7440-48-4	1	mg/kg	**2**				
EG020: Copper	7440-50-8	1	mg/kg	**25**				
EG020: Lead	7439-92-1	1	mg/kg	**71**				
EG020: Manganese	7439-96-5	1	mg/kg	**138**				
EG020: Mercury	7439-97-6	0.05	mg/kg	**0.17**				
EG020: Molybdenum	7439-98-7	1	mg/kg	**2**				
EG020: Nickel	7440-02-0	1	mg/kg	**5**				
EG020: Tin	7440-31-5	1	mg/kg	**4**				
EG020: Zinc	7440-66-6	1	mg/kg	**225**				
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**15**				
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1				
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500				
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500				
Acenaphthene	83-32-9	0.500	mg/kg	<0.500				
Fluorene	86-73-7	0.500	mg/kg	<0.500				
Phenanthrene	85-01-8	0.500	mg/kg	<0.500				
Anthracene	120-12-7	0.500	mg/kg	<0.500				
Fluoranthene	206-44-0	0.500	mg/kg	<0.500				
Pyrene	129-00-0	0.500	mg/kg	<0.500				
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500				
Chrysene	218-01-9	0.500	mg/kg	<0.500				
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500				
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500				
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500				
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500				
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500				
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5				

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: DUPLICATE SAMPLE 2 Client sampling date / time: [11-MAY-2017] HK1719576-001
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) - Continued				
C9 - C16 Fraction	----	200	mg/kg	<200
C17 - C35 Fraction	----	500	mg/kg	<500
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)				
Benzene	71-43-2	0.2	mg/kg	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5
Xylenes (Total)	----	2.0	mg/kg	<2.0
EP-074_SR-B: Oxygenated Compounds				
2-Propanone (Acetone)	67-64-1	50	mg/kg	<50
EP-074_SR-E: Halogenated Aliphatics				
Trichloroethene	79-01-6	0.1	mg/kg	<0.1
EP-074_SR-I: Methyl-tert-butyl Ether				
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg	<0.5
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates				
2-Fluorobiphenyl	321-60-8	0.1	%	**103**
4-Terphenyl-d14	1718-51-0	0.1	%	**104**
EP-066S: PCB Surrogate				
Tetrachlorometaxylene	877-09-8	0.1	%	**61.6**
Dibutylchlorendate	1770-80-5	0.1	%	**121**
EP-080_SRS: TPH(Volatile)/BTEX Surrogate				
Dibromofluoromethane	1868-53-7	0.1	%	**91.3**
Toluene-D8	2037-26-5	0.1	%	**107**
4-Bromofluorobenzene	460-00-4	0.1	%	**98.5**
EP-074_SR-S: VOC Surrogates				
Dibromofluoromethane	1868-53-7	0.1	%	**91.3**
Toluene-D8	2037-26-5	0.1	%	**107**
4-Bromofluorobenzene	460-00-4	0.1	%	**98.5**

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4484095)								
HK1719573-004	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	28.8	28.6	0.8
HK1719597-002	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	16.1	17.3	7.0
EG: Metals and Major Cations (QC Lot: 4480794)								
HK1719502-002	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.3	0.3	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	4	4	0.0
		EG020: Barium	7440-39-3	1	mg/kg	68	69	0.0
		EG020: Cobalt	7440-48-4	1	mg/kg	11	14	16.4
		EG020: Copper	7440-50-8	1	mg/kg	30	31	4.4
		EG020: Lead	7439-92-1	1	mg/kg	34	38	11.0
		EG020: Manganese	7439-96-5	1	mg/kg	943	922	2.2
		EG020: Molybdenum	7439-98-7	1	mg/kg	3	3	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	8	9	0.0
		EG020: Tin	7440-31-5	1	mg/kg	8	9	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	107	113	5.4
EG: Metals and Major Cations (QC Lot: 4483474)								
HK1719502-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
HK1720014-002	Anonymous	EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)								
HK1718100-001	Anonymous	Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566)								
HK1719502-001	Anonymous	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)								

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077) - Continued								
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)								
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Benzene**	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)								
HK1717830-004	Anonymous	**2-Propanone (Acetone)**	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Trichloroethene**	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)								
HK1717830-004	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4480794)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	89.3	----	75	111	----	----
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	102	----	75	111	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	89.9	----	79	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	96.3	----	80	108	----	----
EG020: Cobalt	7440-48-4	1	mg/kg	<1	5 mg/kg	101	----	74	108	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	105	----	79	109	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	97.1	----	81	107	----	----
EG020: Manganese	7439-96-5	1	mg/kg	<1	5 mg/kg	103	----	74	116	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	109	----	74	114	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	89.5	----	78	104	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	100	----	74	106	----	----
EG020: Tin	7440-31-5	1	mg/kg	<1	5 mg/kg	91.0	----	79	109	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	104	----	76	118	----	----
EG: Metals and Major Cations (QC Lot: 4483474)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	92.0	----	92	122	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)											

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
		LOR	Unit	Result	Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
						LCS	DCS	Low	High	Value	Control Limit
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380) - Continued											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	116	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	102	----	54	104	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	500 µg/kg	94.3	----	58	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	500 µg/kg	100	----	57	103	----	----
Fluorene	86-73-7	50	µg/kg	<50	500 µg/kg	104	----	71	114	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	500 µg/kg	104	----	57	113	----	----
Anthracene	120-12-7	50	µg/kg	<50	500 µg/kg	94.1	----	51	98	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	500 µg/kg	101	----	69	119	----	----
Pyrene	129-00-0	50	µg/kg	<50	500 µg/kg	100	----	65	120	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	500 µg/kg	104	----	70	115	----	----
Chrysene	218-01-9	50	µg/kg	<50	500 µg/kg	99.5	----	66	118	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	500 µg/kg	100	----	68	123	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	500 µg/kg	100	----	68	117	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	500 µg/kg	90.4	----	43	125	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	500 µg/kg	96.8	----	64	118	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	500 µg/kg	95.0	----	38	131	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	500 µg/kg	95.1	----	36	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	106	----	69	119	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	97.8	----	58	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	93.0	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4478769)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	93.1	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	96.3	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	96.0	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	95.1	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	98.4	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	96.2	----	77	134	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4478769)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	99.4	----	79	131	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4478769)											
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	88.6	----	79	109	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4478769)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	98.9	----	77	114	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4480794)										
HK1719502-001	Anonymous	**EG020: Antimony**	7440-36-0	5 mg/kg	86.2	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	92.1	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	100	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	102	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	88.7	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	86.9	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	85.8	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	94.1	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	84.4	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4483474)										
HK1719502-001	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	86.0	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4477380)										
HK1718100-003	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	111	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566)										
HK1719502-002	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	92.6	----	50	130	----	----
		Acenaphthylene	208-96-8	500 µg/kg	102	----	50	130	----	----
		Acenaphthene	83-32-9	500 µg/kg	100	----	50	130	----	----
		Fluorene	86-73-7	500 µg/kg	102	----	50	130	----	----
		Phenanthrene	85-01-8	500 µg/kg	103	----	50	130	----	----
		Anthracene	120-12-7	500 µg/kg	100	----	50	130	----	----
		Fluoranthene	206-44-0	500 µg/kg	98.7	----	50	130	----	----
		Pyrene	129-00-0	500 µg/kg	98.3	----	50	130	----	----
		Benz(a)anthracene	56-55-3	500 µg/kg	101	----	50	130	----	----
		Chrysene	218-01-9	500 µg/kg	94.0	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	500 µg/kg	92.9	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	500 µg/kg	97.8	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	500 µg/kg	101	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	500 µg/kg	89.5	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	500 µg/kg	88.4	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	500 µg/kg	97.8	----	50	130	----	----

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPD (%): Value	RPD (%): Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480566) - Continued										
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478077)										
HK1717969-001	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	88.8	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	74.9	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4478079)										
HK1717969-001	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	90.3	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 11
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1720400
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORK	Quote number	: HK/5386/2016	Date Samples Received	: 16-MAY-2017
Order number	: ----			Issue Date	: 25-MAY-2017
C-O-C number	: ----			No. of samples received	: 3
Site	: ----			No. of samples analysed	: 3

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 16-MAY-2017 to 25-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1720400

Sample(s) were received in chilled condition.

Soil sample(s) analysed on an as received basis. Result(s) reported on a dry weight basis.

Soil sample(s) as received, digested by In-house method E-ASTM D3974-09 prior to determination of metals. The In-house method is developed based on ASTM D3974-09 method.

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: SPS-02-5 0.5M BGL Client sampling date / time: [16-MAY-2017] HK1720400-001	Client sample ID: SPS-02-5 1.5M BGL Client sampling date / time: [16-MAY-2017] HK1720400-002	Client sample ID: SPS-02-5 4.5M BGL Client sampling date / time: [16-MAY-2017] HK1720400-003		
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	**24.1**	**20.4**	**25.4**		
EG: Metals and Major Cations								
EG020: Antimony	7440-36-0	1	mg/kg	**1**	<1	<1		
EG020: Arsenic	7440-38-2	1	mg/kg	**6**	**6**	**12**		
EG020: Barium	7440-39-3	1	mg/kg	**83**	**49**	**59**		
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2		
EG020: Cobalt	7440-48-4	1	mg/kg	**2**	**2**	**2**		
EG020: Copper	7440-50-8	1	mg/kg	**13**	**2**	**7**		
EG020: Lead	7439-92-1	1	mg/kg	**70**	**26**	**45**		
EG020: Manganese	7439-96-5	1	mg/kg	**216**	**42**	**89**		
EG020: Mercury	7439-97-6	0.05	mg/kg	**0.13**	<0.05	**0.06**		
EG020: Molybdenum	7439-98-7	1	mg/kg	**1**	<1	**1**		
EG020: Nickel	7440-02-0	1	mg/kg	**5**	**2**	**4**		
EG020: Tin	7440-31-5	1	mg/kg	**4**	**2**	**2**		
EG020: Zinc	7440-66-6	1	mg/kg	**166**	**24**	**96**		
EG049: Trivalent Chromium	16065-83-1	1	mg/kg	**13**	**7**	**10**		
EG3060: Hexavalent Chromium	18540-29-9	1	mg/kg	<1	<1	<1		
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	<0.1		
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Acenaphthylene	208-96-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Acenaphthene	83-32-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Fluorene	86-73-7	0.500	mg/kg	<0.500	<0.500	<0.500		
Phenanthrene	85-01-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Anthracene	120-12-7	0.500	mg/kg	<0.500	<0.500	<0.500		
Fluoranthene	206-44-0	0.500	mg/kg	<0.500	<0.500	<0.500		
Pyrene	129-00-0	0.500	mg/kg	<0.500	<0.500	<0.500		
Benz(a)anthracene	56-55-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Chrysene	218-01-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(b)fluoranthene	205-99-2	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(k)fluoranthene	207-08-9	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(a)pyrene	50-32-8	0.500	mg/kg	<0.500	<0.500	<0.500		
Indeno(1.2.3.cd)pyrene	193-39-5	0.500	mg/kg	<0.500	<0.500	<0.500		
Dibenz(a.h)anthracene	53-70-3	0.500	mg/kg	<0.500	<0.500	<0.500		
Benzo(g.h.i)perylene	191-24-2	0.500	mg/kg	<0.500	<0.500	<0.500		
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	5	mg/kg	<5	<5	<5		

Sub-Matrix: **SOIL**				*Client sample ID*	**SPS-02-5 0.5M BGL**	**SPS-02-5 1.5M BGL**	**SPS-02-5 4.5M BGL**		
				Client sampling date / time	[16-MAY-2017]	[16-MAY-2017]	[16-MAY-2017]		
Compound	*CAS Number*	*LOR*	*Unit*		**HK1720400-001**	**HK1720400-002**	**HK1720400-003**		
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) - Continued									
C9 - C16 Fraction	----	200	mg/kg		<200	<200	<200		
C17 - C35 Fraction	----	500	mg/kg		<500	<500	<500		
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2		
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5		
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5		
meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg		<1.0	<1.0	<1.0		
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5		
Xylenes (Total)	----	2.0	mg/kg		<2.0	<2.0	<2.0		
EP-074_SR-B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	50	mg/kg		<50	<50	<50		
EP-074_SR-E: Halogenated Aliphatics									
Trichloroethene	79-01-6	0.1	mg/kg		<0.1	<0.1	<0.1		
EP-074_SR-I: Methyl-tert-butyl Ether									
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	mg/kg		<0.5	<0.5	<0.5		
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**108**	**99.6**	**100**		
4-Terphenyl-d14	1718-51-0	0.1	%		**108**	**105**	**105**		
EP-066S: PCB Surrogate									
Tetrachlorometaxylene	877-09-8	0.1	%		**62.2**	**54.8**	**62.0**		
Dibutylchlorendate	1770-80-5	0.1	%		**116**	**110**	**87.0**		
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
Dibromofluoromethane	1868-53-7	0.1	%		**90.4**	**90.0**	**92.6**		
Toluene-D8	2037-26-5	0.1	%		**110**	**108**	**108**		
4-Bromofluorobenzene	460-00-4	0.1	%		**99.4**	**99.9**	**100**		
EP-074_SR-S: VOC Surrogates									
Dibromofluoromethane	1868-53-7	0.1	%		**90.4**	**90.0**	**92.6**		
Toluene-D8	2037-26-5	0.1	%		**110**	**108**	**108**		
4-Bromofluorobenzene	460-00-4	0.1	%		**99.4**	**99.9**	**100**		

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 4484669)								
HK1720397-002	Anonymous	**EA055: Moisture Content (dried @ 103°C)**	----	0.1	%	24.4	24.1	1.0
EG: Metals and Major Cations (QC Lot: 4482885)								
HK1720400-002	SPS-02-5 1.5M BGL	**EG020: Mercury**	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Antimony	7440-36-0	1	mg/kg	<1	<1	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	6	6	0.0
		EG020: Barium	7440-39-3	1	mg/kg	49	50	2.8
		EG020: Cobalt	7440-48-4	1	mg/kg	2	2	0.0
		EG020: Copper	7440-50-8	1	mg/kg	2	2	0.0
		EG020: Lead	7439-92-1	1	mg/kg	26	27	0.0
		EG020: Manganese	7439-96-5	1	mg/kg	42	41	2.6
		EG020: Molybdenum	7439-98-7	1	mg/kg	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	2	2	0.0
		EG020: Tin	7440-31-5	1	mg/kg	2	2	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	24	25	4.5
EG: Metals and Major Cations (QC Lot: 4483475)								
HK1720397-005	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	1	mg/kg	<1	<1	0.0
EP-066: Polychlorinated Biphenyls (QC Lot: 4481488)								
HK1717969-001	Anonymous	**Total Polychlorinated biphenyls**	----	0.1	mg/kg	<0.1	<0.1	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4482947)								
HK1720400-003	SPS-02-5 4.5M BGL	**Naphthalene**	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a.h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g.h.i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4482954)								
HK1719858-001	Anonymous	**Fluoranthene**	206-44-0	150	µg/kg	<150	<150	0.0
		Pyrene	129-00-0	150	µg/kg	<150	<150	0.0

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4482954) - Continued								
HK1719858-001	Anonymous	**Benz(a)anthracene**	56-55-3	150	µg/kg	<150	<150	0.0
		Chrysene	218-01-9	150	µg/kg	<150	<150	0.0
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	0.0
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	0.0
		Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	150	µg/kg	<150	<150	0.0
		Dibenz(a.h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g.h.i)perylene	191-24-2	150	µg/kg	<150	<150	0.0
		Naphthalene	91-20-3	50	µg/kg	<50	<50	0.0
		Acenaphthylene	208-96-8	50	µg/kg	<50	<50	0.0
		Acenaphthene	83-32-9	50	µg/kg	<50	<50	0.0
		Fluorene	86-73-7	50	µg/kg	<50	<50	0.0
		Phenanthrene	85-01-8	50	µg/kg	<50	<50	0.0
		Anthracene	120-12-7	50	µg/kg	<50	<50	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481497)								
HK1719575-001	Anonymous	**C9 - C16 Fraction**	----	200	mg/kg	<200	<200	0.0
		C17 - C35 Fraction	----	500	mg/kg	<500	<500	0.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481502)								
HK1719575-001	Anonymous	**C6 - C8 Fraction**	----	5	mg/kg	<5	<5	0.0
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4482956)								
HK1720397-001	Anonymous	**Benzene**	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0
		Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0
		Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0
		ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0
		meta- & para-Xylene	108-38-3 106-42-3	1.0	mg/kg	<1.0	<1.0	0.0
		Xylenes (Total)	----	2.0	mg/kg	<2.0	<2.0	0.0
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4482956)								
HK1720397-001	Anonymous	**2-Propanone (Acetone)**	67-64-1	50	mg/kg	<50	<50	0.0
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4482956)								
HK1720397-001	Anonymous	**Trichloroethene**	79-01-6	0.1	mg/kg	<0.1	<0.1	0.0
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4482956)								
HK1720397-001	Anonymous	**Methyl tert-Butyl Ether (MTBE)**	1634-04-4	0.5	mg/kg	<0.5	<0.5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4482885)											
EG020: Antimony	7440-36-0	1	mg/kg	<1	5 mg/kg	90.4	----	75	111	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4482885) - Continued											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	82.9	----	75	111	----	----
EG020: Barium	7440-39-3	1	mg/kg	<1	5 mg/kg	94.3	----	79	111	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	96.4	----	80	108	----	----
EG020: Cobalt	7440-48-4	1	mg/kg	<1	5 mg/kg	87.8	----	74	108	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	97.1	----	79	109	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	96.6	----	81	107	----	----
EG020: Manganese	7439-96-5	1	mg/kg	<1	5 mg/kg	94.4	----	74	116	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	103	----	74	114	----	----
EG020: Molybdenum	7439-98-7	1	mg/kg	<1	5 mg/kg	95.7	----	78	104	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	95.8	----	74	106	----	----
EG020: Tin	7440-31-5	1	mg/kg	<1	5 mg/kg	98.8	----	79	109	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	101	----	76	118	----	----
EG: Metals and Major Cations (QC Lot: 4483475)											
EG3060: Hexavalent Chromium	18540-29-9	0.5	mg/kg	<0.5	2.5 mg/kg	96.0	----	92	122	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4481488)											
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	0.5 mg/kg	109	----	43	152	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4482947)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	70.4	----	54	104	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	500 µg/kg	66.6	----	58	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	500 µg/kg	73.5	----	57	103	----	----
Fluorene	86-73-7	50	µg/kg	<50	500 µg/kg	77.7	----	71	114	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	500 µg/kg	78.9	----	57	113	----	----
Anthracene	120-12-7	50	µg/kg	<50	500 µg/kg	67.2	----	51	98	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	500 µg/kg	81.5	----	69	119	----	----
Pyrene	129-00-0	50	µg/kg	<50	500 µg/kg	80.4	----	65	120	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	500 µg/kg	74.4	----	70	115	----	----
Chrysene	218-01-9	50	µg/kg	<50	500 µg/kg	66.7	----	66	118	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	500 µg/kg	80.7	----	68	123	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	500 µg/kg	78.2	----	68	117	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	500 µg/kg	72.3	----	43	125	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	500 µg/kg	84.1	----	64	118	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	500 µg/kg	73.8	----	38	131	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	500 µg/kg	84.7	----	36	131	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4482954)											
Naphthalene	91-20-3	50	µg/kg	<50	500 µg/kg	93.1	----	54	104	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	500 µg/kg	75.2	----	58	104	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	500 µg/kg	90.3	----	57	103	----	----
Fluorene	86-73-7	50	µg/kg	<50	500 µg/kg	94.5	----	71	114	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	500 µg/kg	96.4	----	57	113	----	----
Anthracene	120-12-7	50	µg/kg	<50	500 µg/kg	77.3	----	51	98	----	----

Matrix: SOIL

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4482954) - Continued											
Fluoranthene	206-44-0	50	µg/kg	<50	500 µg/kg	90.1	----	69	119	----	----
Pyrene	129-00-0	50	µg/kg	<50	500 µg/kg	89.4	----	65	120	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	500 µg/kg	88.9	----	70	115	----	----
Chrysene	218-01-9	50	µg/kg	<50	500 µg/kg	81.9	----	66	118	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	500 µg/kg	89.7	----	68	123	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	500 µg/kg	82.6	----	68	117	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	500 µg/kg	70.4	----	43	125	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	500 µg/kg	89.6	----	64	118	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	500 µg/kg	92.1	----	38	131	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	500 µg/kg	94.8	----	36	131	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481497)											
C9 - C16 Fraction	----	200	mg/kg	<200	31.5 mg/kg	84.8	----	69	117	----	----
C17 - C35 Fraction	----	500	mg/kg	<500	67.5 mg/kg	77.7	----	51	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481502)											
C6 - C8 Fraction	----	5	mg/kg	<5	4.5 mg/kg	91.6	----	77	119	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4482956)											
Benzene	71-43-2	0.1	mg/kg	<0.1	0.25 mg/kg	90.5	----	75	121	----	----
Toluene	108-88-3	0.2	mg/kg	<0.2	0.25 mg/kg	97.4	----	77	130	----	----
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	0.25 mg/kg	101	----	77	128	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.4	mg/kg	<0.4	0.50 mg/kg	101	----	70	146	----	----
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.25 mg/kg	105	----	82	118	----	----
Xylenes (Total)	----	1.0	mg/kg	<1.0	0.75 mg/kg	102	----	77	134	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4482956)											
2-Propanone (Acetone)	67-64-1	2	mg/kg	<2	2.5 mg/kg	103	----	79	131	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4482956)											
Trichloroethene	79-01-6	0.1	mg/kg	<0.1	0.25 mg/kg	89.0	----	79	109	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4482956)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.2	mg/kg	<0.2	0.25 mg/kg	93.2	----	77	114	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 4482885)										
HK1720400-001	SPS-02-5 0.5M BGL	**EG020: Antimony**	7440-36-0	5 mg/kg	86.4	----	75	125	----	----
		EG020: Arsenic	7440-38-2	5 mg/kg	86.0	----	75	125	----	----
		EG020: Barium	7440-39-3	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	94.2	----	75	125	----	----
		EG020: Cobalt	7440-48-4	5 mg/kg	83.0	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	96.3	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Manganese	7439-96-5	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	84.0	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	5 mg/kg	92.0	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	79.6	----	75	125	----	----
		EG020: Tin	7440-31-5	5 mg/kg	88.9	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EG: Metals and Major Cations (QC Lot: 4483475)										
HK1720397-004	Anonymous	**EG3060: Hexavalent Chromium**	18540-29-9	2.5 mg/kg	90.0	----	75	125	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4481488)										
HK1717969-001	Anonymous	**Total Polychlorinated biphenyls**	----	0.5 mg/kg	111	----	50	130	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4482947)										
HK1720400-003	SPS-02-5 4.5M BGL	**Naphthalene**	91-20-3	500 µg/kg	75.8	----	50	130	----	----
		Acenaphthylene	208-96-8	500 µg/kg	74.9	----	50	130	----	----
		Acenaphthene	83-32-9	500 µg/kg	75.7	----	50	130	----	----
		Fluorene	86-73-7	500 µg/kg	75.6	----	50	130	----	----
		Phenanthrene	85-01-8	500 µg/kg	79.2	----	50	130	----	----
		Anthracene	120-12-7	500 µg/kg	72.7	----	50	130	----	----
		Fluoranthene	206-44-0	500 µg/kg	83.2	----	50	130	----	----
		Pyrene	129-00-0	500 µg/kg	83.8	----	50	130	----	----
		Benz(a)anthracene	56-55-3	500 µg/kg	76.7	----	50	130	----	----
		Chrysene	218-01-9	500 µg/kg	68.3	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	500 µg/kg	81.0	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	500 µg/kg	76.4	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	500 µg/kg	78.2	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	500 µg/kg	83.4	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	500 µg/kg	71.6	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	500 µg/kg	81.2	----	50	130	----	----

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%): MS	Spike Recovery (%): MSD	Recovery Limits (%): Low	Recovery Limits (%): High	RPD (%): Value	RPD (%): Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4482947) - Continued										
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4482954)										
HK1719858-001	Anonymous	**Naphthalene**	91-20-3	500 µg/kg	92.1	----	50	130	----	----
		Acenaphthylene	208-96-8	500 µg/kg	95.5	----	50	130	----	----
		Acenaphthene	83-32-9	500 µg/kg	91.9	----	50	130	----	----
		Fluorene	86-73-7	500 µg/kg	93.5	----	50	130	----	----
		Phenanthrene	85-01-8	500 µg/kg	92.3	----	50	130	----	----
		Anthracene	120-12-7	500 µg/kg	88.9	----	50	130	----	----
		Fluoranthene	206-44-0	500 µg/kg	87.1	----	50	130	----	----
		Pyrene	129-00-0	500 µg/kg	87.4	----	50	130	----	----
		Benz(a)anthracene	56-55-3	500 µg/kg	90.1	----	50	130	----	----
		Chrysene	218-01-9	500 µg/kg	81.1	----	50	130	----	----
		Benzo(b)fluoranthene	205-99-2	500 µg/kg	85.9	----	50	130	----	----
		Benzo(k)fluoranthene	207-08-9	500 µg/kg	88.2	----	50	130	----	----
		Benzo(a)pyrene	50-32-8	500 µg/kg	85.1	----	50	130	----	----
		Indeno(1.2.3.cd)pyrene	193-39-5	500 µg/kg	84.0	----	50	130	----	----
		Dibenz(a.h)anthracene	53-70-3	500 µg/kg	85.8	----	50	130	----	----
		Benzo(g.h.i)perylene	191-24-2	500 µg/kg	89.5	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481497)										
HK1719575-002	Anonymous	**C9 - C16 Fraction**	----	31.5 mg/kg	71.3	----	50	130	----	----
		C17 - C35 Fraction	----	67.5 mg/kg	60.0	----	50	130	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4481502)										
HK1719575-002	Anonymous	**C6 - C8 Fraction**	----	4.5 mg/kg	92.6	----	50	130	----	----

Surrogate Control Limits

Sub-Matrix: SOIL

Compound	CAS Number	Recovery Limits (%): Low	Recovery Limits (%): High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121
EP-074_SR-S: VOC Surrogates			

Sub-Matrix: **SOIL**

Compound	*CAS Number*	*Recovery Limits (%)* *Low*	*High*
EP-074_SR-S: VOC Surrogates - Continued			
Dibromofluoromethane	1868-53-7	80	120
Toluene-D8	2037-26-5	81	117
4-Bromofluorobenzene	460-00-4	74	121

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 7
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719391
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: QUEEN S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS	Quote number	: HK/5386/2016	Date Samples Received	: 09-MAY-2017
Order number	: ----			Issue Date	: 19-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 09-MAY-2017 to 19-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719391

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Water sample(s) were filtered prior to dissolved metal analysis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: EQUIPMENT BLANK Client sampling date / time: [09-MAY-2017] HK1719391-001				
EG: Metals and Major Cations - Filtered								
EG020: Antimony	7440-36-0	1	µg/L	<1				
EG020: Arsenic	7440-38-2	10	µg/L	<10				
EG020: Barium	7440-39-3	1	µg/L	<1				
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2				
EG020: Cobalt	7440-48-4	1	µg/L	<1				
EG020: Copper	7440-50-8	1	µg/L	<1				
EG020: Lead	7439-92-1	1	µg/L	<1				
EG020: Manganese	7439-96-5	1	µg/L	<1				
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5				
EG020: Molybdenum	7439-98-7	1	µg/L	<1				
EG020: Nickel	7440-02-0	1	µg/L	<1				
EG020: Tin	7440-31-5	1	µg/L	<1				
EG020: Zinc	7440-66-6	10	µg/L	**26**				
EG049: Trivalent Chromium	16065-83-1	20	µg/L	<20				
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20				
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	1	µg/L	<1				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	2.0	µg/L	<2.0				
Acenaphthylene	208-96-8	2.0	µg/L	<2.0				
Acenaphthene	83-32-9	2.0	µg/L	<2.0				
Fluorene	86-73-7	2.0	µg/L	<2.0				
Phenanthrene	85-01-8	2.0	µg/L	<2.0				
Anthracene	120-12-7	2.0	µg/L	<2.0				
Fluoranthene	206-44-0	2.0	µg/L	<2.0				
Pyrene	129-00-0	2.0	µg/L	<2.0				
Benz(a)anthracene	56-55-3	2.0	µg/L	<2.0				
Chrysene	218-01-9	1.0	µg/L	<1.0				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0				
Benzo(k)fluoranthene	207-08-9	2.0	µg/L	<2.0				
Benzo(a)pyrene	50-32-8	2.0	µg/L	<2.0				
Indeno(1.2.3.cd)pyrene	193-39-5	2.0	µg/L	<2.0				
Dibenz(a.h)anthracene	53-70-3	2.0	µg/L	<2.0				
Benzo(g.h.i)perylene	191-24-2	2.0	µg/L	<2.0				
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
Phenol	108-95-2	2.0	µg/L	<2.0				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20				
C9 - C16 Fraction	----	500	µg/L	<500				

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: EQUIPMENT BLANK Client sampling date / time: [09-MAY-2017] HK1719391-001				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) - Continued								
C17 - C35 Fraction	----	500	µg/L	<500				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**78.5**				
4-Terphenyl-d14	1718-51-0	0.1	%	**79.5**				
EP-066S: PCB Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	**55.6**				
Dibutylchlorendate	1770-80-5	0.1	%	**71.4**				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
Dibromofluoromethane	1868-53-7	0.1	%	**90.1**				
Toluene-D8	2037-26-5	0.1	%	**102**				
4-Bromofluorobenzene	460-00-4	0.1	%	**97.8**				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**90.1**				
Toluene-D8	2037-26-5	0.1	%	**102**				
4-Bromofluorobenzene	460-00-4	0.1	%	**97.8**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4479566)											
EG020: Antimony	7440-36-0	1	µg/L	<1	100 µg/L	98.0	----	75	107	----	----
EG020: Arsenic	7440-38-2	10	µg/L	<10	100 µg/L	97.0	----	77	109	----	----
EG020: Barium	7440-39-3	1	µg/L	<1	100 µg/L	103	----	79	109	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	100 µg/L	96.0	----	79	109	----	----
EG020: Cobalt	7440-48-4	1	µg/L	<1	100 µg/L	103	----	78	106	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	100 µg/L	103	----	79	107	----	----
EG020: Lead	7439-92-1	1	µg/L	<1	100 µg/L	97.0	----	81	107	----	----
EG020: Manganese	7439-96-5	1	µg/L	<1	100 µg/L	97.0	----	79	109	----	----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	90.0	----	77	117	----	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	100 µg/L	90.0	----	76	108	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	100 µg/L	102	----	78	108	----	----
EG020: Tin	7440-31-5	10	µg/L	<10	100 µg/L	93.0	----	77	107	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	100 µg/L	102	----	77	109	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 4479567)											
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	100 µg/L	97.9	----	80	106	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4480147)											
Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	74.6	----	64	150	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480133)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	100	----	31	102	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	58.6	----	31	105	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	77.4	----	32	93	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	93.4	----	33	100	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	58.1	----	30	107	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	59.1	----	28	108	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	99.3	----	56	121	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	99.4	----	56	125	----	----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	92.7	----	72	117	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	86.7	----	57	117	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	87.8	----	71	119	----	----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	102	----	70	114	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	93.7	----	59	121	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	88.3	----	56	118	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	86.6	----	39	123	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	97.0	----	42	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4480133)											

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4480133) - Continued											
Phenol	108-95-2	5	µg/L	<5.0	0.5 µg/L	13.6	----	11	83	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4477399)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	79.3	----	63	127	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4480134)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	87.4	----	54	104	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	92.7	----	61	125	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4480429)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	87.3	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	85.9	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	94.4	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	93.2	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	99.2	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	95.2	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4480429)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	91.7	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4480429)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	109	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4480429)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	89.0	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4479566)										
HK1719391-001	EQUIPMENT BLANK	**EG020: Antimony**	7440-36-0	100 µg/L	97.0	----	75	125	----	----
		EG020: Arsenic	7440-38-2	100 µg/L	94.0	----	75	125	----	----
		EG020: Barium	7440-39-3	100 µg/L	110	----	75	125	----	----
		EG020: Cadmium	7440-43-9	100 µg/L	98.0	----	75	125	----	----
		EG020: Cobalt	7440-48-4	100 µg/L	105	----	75	125	----	----
		EG020: Copper	7440-50-8	100 µg/L	105	----	75	125	----	----
		EG020: Lead	7439-92-1	100 µg/L	100	----	75	125	----	----
		EG020: Manganese	7439-96-5	100 µg/L	100	----	75	125	----	----
		EG020: Mercury	7439-97-6	2 µg/L	100	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	100 µg/L	91.0	----	75	125	----	----
		EG020: Nickel	7440-02-0	100 µg/L	113	----	75	125	----	----
		EG020: Tin	7440-31-5	100 µg/L	95.0	----	75	125	----	----
		EG020: Zinc	7440-66-6	100 µg/L	94.0	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 4479567)										
HK1719391-001	EQUIPMENT BLANK	**EG050: Hexavalent Chromium**	18540-29-9	100 µg/L	98.8	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 7
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1720403
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORK	Quote number	: HK/5386/2016	Date Samples Received	: 16-MAY-2017
Order number	: ----			Issue Date	: 26-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 16-MAY-2017 to 26-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1720403

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Water sample(s) were filtered prior to dissolved metal analysis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: EQUIPMENT BLANK Client sampling date / time: [16-MAY-2017] HK1720403-001				
EG: Metals and Major Cations - Filtered								
EG020: Antimony	7440-36-0	1	µg/L	<1				
EG020: Arsenic	7440-38-2	10	µg/L	<10				
EG020: Barium	7440-39-3	1	µg/L	<1				
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2				
EG020: Cobalt	7440-48-4	1	µg/L	<1				
EG020: Copper	7440-50-8	1	µg/L	<1				
EG020: Lead	7439-92-1	1	µg/L	<1				
EG020: Manganese	7439-96-5	1	µg/L	<1				
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5				
EG020: Molybdenum	7439-98-7	1	µg/L	<1				
EG020: Nickel	7440-02-0	1	µg/L	<1				
EG020: Tin	7440-31-5	1	µg/L	<1				
EG020: Zinc	7440-66-6	10	µg/L	<10				
EG049: Trivalent Chromium	16065-83-1	20	µg/L	<20				
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20				
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	1	µg/L	<1				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	2.0	µg/L	<2.0				
Acenaphthylene	208-96-8	2.0	µg/L	<2.0				
Acenaphthene	83-32-9	2.0	µg/L	<2.0				
Fluorene	86-73-7	2.0	µg/L	<2.0				
Phenanthrene	85-01-8	2.0	µg/L	<2.0				
Anthracene	120-12-7	2.0	µg/L	<2.0				
Fluoranthene	206-44-0	2.0	µg/L	<2.0				
Pyrene	129-00-0	2.0	µg/L	<2.0				
Benz(a)anthracene	56-55-3	2.0	µg/L	<2.0				
Chrysene	218-01-9	1.0	µg/L	<1.0				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0				
Benzo(k)fluoranthene	207-08-9	2.0	µg/L	<2.0				
Benzo(a)pyrene	50-32-8	2.0	µg/L	<2.0				
Indeno(1.2.3.cd)pyrene	193-39-5	2.0	µg/L	<2.0				
Dibenz(a.h)anthracene	53-70-3	2.0	µg/L	<2.0				
Benzo(g.h.i)perylene	191-24-2	2.0	µg/L	<2.0				
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate								
Phenol	108-95-2	2.0	µg/L	<2.0				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20				
C9 - C16 Fraction	----	500	µg/L	<500				

Sub-Matrix: WATER			Client sample ID	EQUIPMENT BLANK				
			Client sampling date / time	[16-MAY-2017]				
Compound	CAS Number	LOR	Unit	HK1720403-001				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) - Continued								
C17 - C35 Fraction	----	500	µg/L	<500				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**63.1**				
4-Terphenyl-d14	1718-51-0	0.1	%	**90.8**				
EP-066S: PCB Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	**55.0**				
Dibutylchlorendate	1770-80-5	0.1	%	**101**				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
Dibromofluoromethane	1868-53-7	0.1	%	**91.1**				
Toluene-D8	2037-26-5	0.1	%	**96.1**				
4-Bromofluorobenzene	460-00-4	0.1	%	**101**				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**91.1**				
Toluene-D8	2037-26-5	0.1	%	**96.1**				
4-Bromofluorobenzene	460-00-4	0.1	%	**101**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4483403)											
EG020: Antimony	7440-36-0	1	µg/L	<1	100 µg/L	90.7	----	75	107	----	----
EG020: Arsenic	7440-38-2	10	µg/L	<10	100 µg/L	99.7	----	77	109	----	----
EG020: Barium	7440-39-3	1	µg/L	<1	100 µg/L	91.5	----	79	109	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	100 µg/L	91.0	----	79	109	----	----
EG020: Cobalt	7440-48-4	1	µg/L	<1	100 µg/L	87.7	----	78	106	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	100 µg/L	81.2	----	79	107	----	----
EG020: Lead	7439-92-1	1	µg/L	<1	100 µg/L	90.6	----	81	107	----	----
EG020: Manganese	7439-96-5	1	µg/L	<1	100 µg/L	98.8	----	79	109	----	----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	99.8	----	77	117	----	----
EG020: Molybdenum	7439-98-7	1	µg/L	<1	100 µg/L	89.3	----	76	108	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	100 µg/L	80.1	----	78	108	----	----
EG020: Tin	7440-31-5	10	µg/L	<10	100 µg/L	92.3	----	77	107	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	100 µg/L	99.7	----	77	109	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 4483404)											
EG050: Hexavalent Chromium	18540-29-9	20	µg/L	<20	100 µg/L	98.4	----	80	106	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4480147)											
Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	74.6	----	64	150	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4480133)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	100	----	31	102	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	58.6	----	31	105	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	77.4	----	32	93	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	93.4	----	33	100	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	58.1	----	30	107	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	59.1	----	28	108	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	99.3	----	56	121	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	99.4	----	56	125	----	----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	92.7	----	72	117	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	86.7	----	57	117	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	87.8	----	71	119	----	----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	102	----	70	114	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	93.7	----	59	121	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	88.3	----	56	118	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	86.6	----	39	123	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	97.0	----	42	130	----	----
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4480133)											

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-076HK: Phenol, Hexachlorobenzene and Bis(2-ethylhexyl) Phthalate (QC Lot: 4480133) - Continued											
Phenol	108-95-2	5	µg/L	<5.0	0.5 µg/L	13.6	----	11	83	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4480134)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	87.4	----	54	104	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	92.7	----	61	125	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4483329)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	83.5	----	63	127	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4482306)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	88.5	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	96.6	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	96.8	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	93.7	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	101	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	96.0	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4482306)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	112	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4482306)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	90.1	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4482306)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	82.8	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
					MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4483403)										
HK1720403-001	EQUIPMENT BLANK	**EG020: Antimony**	7440-36-0	100 µg/L	91.4	----	75	125	----	----
		EG020: Arsenic	7440-38-2	100 µg/L	77.5	----	75	125	----	----
		EG020: Barium	7440-39-3	100 µg/L	92.6	----	75	125	----	----
		EG020: Cadmium	7440-43-9	100 µg/L	88.8	----	75	125	----	----
		EG020: Cobalt	7440-48-4	100 µg/L	89.8	----	75	125	----	----
		EG020: Copper	7440-50-8	100 µg/L	83.6	----	75	125	----	----
		EG020: Lead	7439-92-1	100 µg/L	87.0	----	75	125	----	----
		EG020: Manganese	7439-96-5	100 µg/L	80.2	----	75	125	----	----
		EG020: Mercury	7439-97-6	2 µg/L	93.0	----	75	125	----	----
		EG020: Molybdenum	7439-98-7	100 µg/L	88.4	----	75	125	----	----
		EG020: Nickel	7440-02-0	100 µg/L	83.2	----	75	125	----	----
		EG020: Tin	7440-31-5	100 µg/L	93.1	----	75	125	----	----
		EG020: Zinc	7440-66-6	100 µg/L	78.2	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 4483404)										
HK1720403-001	EQUIPMENT BLANK	**EG050: Hexavalent Chromium**	18540-29-9	100 µg/L	99.4	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719398
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: QUEEN S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS	Quote number	: HK/5386/2016	Date Samples Received	: 09-MAY-2017
Order number	: ----			Issue Date	: 18-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	**Manager - Organics**	**Organics**

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 09-MAY-2017 to 16-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719398

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: FIELD BLANK Client sampling date / time: [09-MAY-2017] HK1719398-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**91.4**				
Toluene-D8	2037-26-5	0.1	%	**101**				
4-Bromofluorobenzene	460-00-4	0.1	%	**98.2**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4480429)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	87.3	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	85.9	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	94.4	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	93.2	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	99.2	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	95.2	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4480429)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	91.7	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4480429)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	109	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4480429)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	89.0	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1720402
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORK	Quote number	: HK/5386/2016	Date Samples Received	: 16-MAY-2017
Order number	: ----			Issue Date	: 25-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

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This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	**Manager - Organics**	**Organics**

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 16-MAY-2017 to 24-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1720402

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: FIELD BLANK Client sampling date / time: [16-MAY-2017] HK1720402-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**91.1**				
Toluene-D8	2037-26-5	0.1	%	**96.1**				
4-Bromofluorobenzene	460-00-4	0.1	%	**99.8**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4482306)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	88.5	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	96.6	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	96.8	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	93.7	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	101	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	96.0	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4482306)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	112	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4482306)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	90.1	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4482306)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	82.8	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1717839
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: 862	Quote number	: HK/5386/2016	Date Samples Received	: 02-MAY-2017
Order number	: ----			Issue Date	: 12-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: QUEEN'S HILL			No. of samples analysed	: 1

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This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 02-MAY-2017 to 11-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1717839

Project Name: Queen's Hill Development - Sewage Pumping Station Works.

Sample(s) were picked up from client by ALS Technichem (HK) staff in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: [29-APR-2017] HK1717839-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**92.6**				
Toluene-D8	2037-26-5	0.1	%	**98.4**				
4-Bromofluorobenzene	460-00-4	0.1	%	**99.8**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4476666)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	87.8	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	83.9	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	97.1	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	95.1	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	102	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	97.2	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4476666)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	96.4	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4476666)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	80.9	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4476666)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	86.7	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719402
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: QUEEN S HILL DEVELOPMENT - SEWAGE PUMPING STATION WORKS	Quote number	: HK/5386/2016	Date Samples Received	: 09-MAY-2017
Order number	: ----			Issue Date	: 18-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

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This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	**Manager - Organics**	**Organics**

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 09-MAY-2017 to 16-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719402

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: [09-MAY-2017] HK1719402-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**94.6**				
Toluene-D8	2037-26-5	0.1	%	**102**				
4-Bromofluorobenzene	460-00-4	0.1	%	**98.3**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4480429)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	87.3	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	85.9	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	94.4	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	93.2	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	99.2	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	95.2	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4480429)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	91.7	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4480429)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	109	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4480429)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	89.0	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719586
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORK	Quote number	: HK/5386/2016	Date Samples Received	: 11-MAY-2017
Order number	: ----			Issue Date	: 22-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	**Manager - Organics**	**Organics**

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 11-MAY-2017 to 16-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719586

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: [11-MAY-2017] HK1719586-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**93.6**				
Toluene-D8	2037-26-5	0.1	%	**95.2**				
4-Bromofluorobenzene	460-00-4	0.1	%	**99.3**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4480429)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	87.3	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	85.9	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	94.4	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	93.2	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	99.2	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	95.2	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4480429)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	91.7	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4480429)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	109	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4480429)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	89.0	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1719579
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORK	Quote number	: HK/5386/2016	Date Samples Received	: 11-MAY-2017
Order number	: ----			Issue Date	: 22-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	**Manager - Organics**	**Organics**

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 11-MAY-2017 to 16-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1719579

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: [10-MAY-2017] HK1719579-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**93.0**				
Toluene-D8	2037-26-5	0.1	%	**101**				
4-Bromofluorobenzene	460-00-4	0.1	%	**98.0**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4480429)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	87.3	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	85.9	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	94.4	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	93.2	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	99.2	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	95.2	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4480429)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	91.7	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4480429)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	109	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4480429)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	89.0	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1720401
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORK	Quote number	: HK/5386/2016	Date Samples Received	: 16-MAY-2017
Order number	: ----			Issue Date	: 25-MAY-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	**Manager - Organics**	**Organics**

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 16-MAY-2017 to 24-MAY-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1720401

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: [16-MAY-2017] HK1720401-001				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**90.7**				
Toluene-D8	2037-26-5	0.1	%	**94.6**				
4-Bromofluorobenzene	460-00-4	0.1	%	**101**				

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4482306)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	88.5	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	96.6	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	96.8	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	93.7	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	101	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	96.0	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4482306)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	112	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4482306)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	90.1	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4482306)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	82.8	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com

*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com

*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: **Queen's Hill Development - Sewage Pumping Station Works**

Site Name (if any):

ALS Technichem (HK) Pty Ltd

Work Order

HK1717830

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☐ Client ☑ # ALS ☐ others: Hugo

***Expected TAT (Working days):** ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1	SPS-02-1 0.5mbgl	SOIL	29 Apr 2017	*Metals – Antimony, Arsenic, Barium, Cadmium, Chromium III&VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc* *Petroleum Carbon Ranges – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35* *Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;* *Semi-volatile Organic Compounds (SVOCs)– Acenaphthene, Acenaphthylene, Anthracene,Benzo(a)anthracene,Benzo(a)pyrene, Benzo(b)fluoranthene,Benzo(g,h,i)perylene, Benzo(k)fluoranthene,Chrysene,Dibenzo(a,h)anthracene,Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene,Naphthalene,Phenanthrene ,Pyrene* *Polychlorinated Biphenyls (PCBs)*
2	SPS-02-4 0.5mbgl	SOIL	29 Apr 2017	
3	SPS-02-1 1.5mbgl	SOIL	29 Apr 2017	
4	SPS-02-4 1.5mbgl	SOIL	29 Apr 2017	
		SOIL		
		SOIL		

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	-2 MAY 2017 16:50	Document Received Date/Time:	-2 MAY 2017 16:50
Sorting Date/ Time:	-2 MAY 2017 17:00	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	4 x soil Jars		
Tray No:	S170	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com

*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com

*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: **Queen's Hill Development - Sewage Pumping Station Works**

Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1719380

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days): ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
01	SPS-02-1-4.5mbgl	SOIL	9 May 17	*Metals – Antimony, Arsenic, Barium, Cadmium, Chromium III&VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc* *Petroleum Carbon Ranges – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35* *Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;* *Semi-volatile Organic Compounds (SVOCs)– Acenaphthene, Acenaphthylene, Anthracene,Benzo(a)anthracene,Benzo(a)pyrene, Benzo(b)fluoranthene,Benzo(g,h,i)perylene, Benzo(k)fluoranthene,Chrysene,Dibenzo(a,h)anthracene,Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene,Naphthalene,Phenanthrene ,Pyrene* *Polychlorinated Biphenyls (PCBs)*
		SOIL		
		SOIL		
		SOIL		
		SOIL		
		SOIL		

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	- 9 MAY 2017 13:45	Document Received Date/Time:	- 9 MAY 2017 13:45
Sorting Date/ Time:	- 9 MAY 2017 14:30	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	1 x 250 ml soil Jar		
Tray No:	S189	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):
*Client Contact Name: Tel:
Email:
*Invoice address to:

*Purchase Order/ Client Order No:
* ALS Quotation No.: HK/5386/2016
*Project Name/No: **Queen's Hill Development - Sewage Pumping Station Works**
Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1719410
Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:
*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days): ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
01	SPS-02-4 4.5mbgl	SOIL	10-5-17	*Metals – Antimony, Arsenic, Barium, Cadmium, Chromium III&VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc* *Petroleum Carbon Ranges – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35* *Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;* *Semi-volatile Organic Compounds (SVOCs)– Acenaphthene, Acenaphthylene, Anthracene,Benzo(a)anthracene,Benzo(a)pyrene, Benzo(b)fluoranthene,Benzo(g,h,i)perylene, Benzo(k)fluoranthene,Chrysene,Dibenzo(a,h)anthracene,Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene,Naphthalene,Phenanthrene ,Pyrene* *Polychlorinated Biphenyls (PCBs)*
		SOIL		
		SOIL		
		SOIL		
		SOIL		
		SOIL		

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	10 MAY 2017 18:40	Document Received Date/Time:	10 MAY 2017 18:40
Sorting Date/ Time:	10 MAY 2017 19:30	Esky Count:	N/A
Condition:	~~Ambient~~ / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	4 x 250 ml soil Jar		
Tray No:	S189	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: ~~Queen's Hill Development - Sewage Pumping Station Works~~

Site Name (if any): TCS 00862/16

ALS Technichem (HK) Pty Ltd
Work Order
HK1719575

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days):** ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)

Other remark: Sample #3 is put On-Hold, confirmed by Client Mr. Martin Li on 12 May, 2017 A.M.

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1	SPS-02-2 0.5mbgl	SOIL	11-5-17	*Metals* – Antimony, Arsenic, Barium, Cadmium, Chromium III&VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc *Petroleum Carbon Ranges* – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35 *Volatile Organic Compounds (VOCs)* – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene; *Semi-volatile Organic Compounds (SVOCs)*– Acenaphthene, Acenaphthylene, Anthracene,Benzo(a)anthracene,Benzo(a)pyrene, Benzo(b)fluoranthene,Benzo(g,h,i)perylene, Benzo(k)fluoranthene,Chrysene,Dibenzo(a,h)anthracene,Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene,Naphthalene,Phenanthrene ,Pyrene *Polychlorinated Biphenyls (PCBs)*
2	SPS-02-2 1.5mbgl	SOIL		
~~3~~	~~SPS-02-2 3.0mbgl~~	SOIL	On-Hold	
4	SPS-02-2 4.5mbgl	SOIL		
		SOIL		
		SOIL		

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	11 MAY 2017 18:40	Document Received Date/Time:	11 MAY 2017 18:40
Sorting Date/ Time:	11 MAY 2017 19:05	Esky Count:	1x Cooler box
Condition:	Ambient / (Chilled) / Frozen	Ice Bricks / Ice	(Yes) / No
Bottle information:	4 x 250 ml soil Jars		
Tray No:	5190	Sort by:	

FBD002A-6 (18/05/2015)

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES
*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:
*Report address to:
*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: jankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):
*Client Contact Name: Tel:
Email:
*Invoice address to:

*Purchase Order/ Client Order No:
* ALS Quotation No.: HK/5386/2016
*Project Name/No: ~~Queen's Hill Development - Sewage Pumping Station Works~~
Site Name (if any): TCS 00862/16

ALS Technichem (HK) Pty Ltd
Work Order
HK1719573
Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:
*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days):** ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)

Other remark: Sample #3 is put on Hold, confirmed by client Mr. Martin Li on 12 May 2017 A.M.

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1	SPS-02-3 0.5mbgl	SOIL	11-5-17	*Metals* – Antimony, Arsenic, Barium, Cadmium, Chromium III&VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc *Petroleum Carbon Ranges* – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35 *Volatile Organic Compounds (VOCs)* – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene; *Semi-volatile Organic Compounds (SVOCs)*– Acenaphthene, Acenaphthylene, Anthracene,Benzo(a)anthracene,Benzo(a)pyrene, Benzo(b)fluoranthene,Benzo(g,h,i)perylene, Benzo(k)fluoranthene,Chrysene,Dibenzo(a,h)anthracene,Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene,Naphthalene,Phenanthrene ,Pyrene *Polychlorinated Biphenyls (PCBs)*
2	SPS-02-3 1.5mbgl	SOIL		
~~3~~	~~SPS-02-3 3.0mbgl~~	SOIL	For Hold	
4	SPS-02-3 4.5mbgl	SOIL		
		SOIL		
		SOIL		

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	11 MAY 2017 18:40	Document Received Date/Time:	11 MAY 2017 18:40
Sorting Date/ Time:	11 MAY 2017 19:05	Esky Count:	1 x cooler box
Condition:	Ambient / (Chilled) / Frozen	Ice Bricks / Ice	(Yes) / No
Bottle information:	4 x 250 ml soil Jars		
Tray No:	S190	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com

*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com

*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: **TCS00862/16 - Queen's Hill Development - Sewage Pumping Station Works**

Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1720400
Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days):** ☐ **Regular (7-10)** ☐ **#Express (5)** ☐ **#Double Express (3)** ☐ **#Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1.	SPS-02-5 0.5mbgl	SOIL	16May17	***Metals*** *– Antimony, Arsenic, Barium, Cadmium, Chromium III&VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc*
2.	SPS-02-5 1.5mbgl	SOIL	〃	***Petroleum Carbon Ranges*** *– Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35*
3.	SPS-02-5 4.5mbgl	SOIL	〃	***Volatile Organic Compounds (VOCs)*** *– Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;*
		SOIL		***Semi-volatile Organic Compounds (SVOCs)*** *– Acenaphthene, Acenaphthylene, Anthracene,Benzo(a)anthracene,Benzo(a)pyrene, Benzo(b)fluoranthene,Benzo(g,h,i)perylene, Benzo(k)fluoranthene,Chrysene,Dibenzo(a,h)anthracene,Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene,Naphthalene,Phenanthrene ,Pyrene*
		SOIL		***Polychlorinated Biphenyls (PCBs)***
		SOIL		

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	16 MAY 2017 18:30	Document Received Date/Time:	16 MAY 2017 18:30
Sorting Date/ Time:	16 MAY 2017 19:30	Esky Count:	1 x cooler box
Condition:	Ambient / (Chilled) / Frozen	Ice Bricks / Ice	(Yes) / No
Bottle information:	3 x 250 ml soil Jars		
Tray No:	S197	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):
*Client Contact Name: Tel:
Email:
*Invoice address to:

*Purchase Order/ Client Order No:
* ALS Quotation No.: HK/5386/2016
*Project Name/No: ~~Queen's Hill Development - Sewage Pumping Station Works~~
Site Name (if any): TCS00862/16

ALS Technichem (HK) Pty Ltd
Work Order
HK1719576
Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:
*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days):** ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1-	Duplicate Sample 2	SOIL	11-5-17	*Metals – Antimony, Arsenic, Barium, Cadmium, Chromium III&VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc* *Petroleum Carbon Ranges – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35* *Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;* *Semi-volatile Organic Compounds (SVOCs)– Acenaphthene, Acenaphthylene, Anthracene,Benzo(a)anthracene,Benzo(a)pyrene, Benzo(b)fluoranthene,Benzo(g,h,i)perylene, Benzo(k)fluoranthene,Chrysene,Dibenzo(a,h)anthracene,Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene,Naphthalene,Phenanthrene ,Pyrene* *Polychlorinated Biphenyls (PCBs)*
		SOIL		
		SOIL		
		SOIL		
		SOIL		
		SOIL		

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	11 MAY 2017 18:40	Document Received Date/Time:	11 MAY 2017 18:40
Sorting Date/ Time:	11 MAY 2017 19:25	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	1 x 250 ml soil Jar		
Tray No:	S190	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com

*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com

*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: **Queen's Hill Development - Sewage Pumping Station Works**

Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1719391

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days):** ☐ **Regular (7-10)** ☐ **#Express (5)** ☐ **#Double Express (3)** ☐ **#Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
①	equipment blank	water	9May2017	*Metals – Antimony, Arsenic, Barium, Cadmium, Chromium III&VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc* *Petroleum Carbon Ranges – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35* *Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;* *Semi-volatile Organic Compounds (SVOCs)– Acenaphthene, Acenaphthylene, Anthracene,Benzo(a)anthracene,Benzo(a)pyrene, Benzo(b)fluoranthene,Benzo(g,h,i)perylene, Benzo(k)fluoranthene,Chrysene,Dibenzo(a,h)anthracene,Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene,Naphthalene,Phenanthrene, Phenol ,Pyrene* *Polychlorinated Biphenyls (PCBs)*

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	-9 MAY 2017 13:45	Document Received Date/Time:	-9 MAY 2017 13:45
Sorting Date/ Time:	-9 MAY 2017 14:40	Esky Count:	1 x Cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	1 x (2x 40ml R/G, 1L Orange, 2x 40ml Blue) 2x 40ml VOCs vials		
Tray No:	R126, 02, V1, B32	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com

*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com

*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: **TCS00862/16 - Queen's Hill Development - Sewage Pumping Station Works**

Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1720403

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days):** ☐ **Regular (7-10)** ☐ **#Express (5)** ☐ **#Double Express (3)** ☐ **#Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
①	equipment blank	water	16 May 2017	***Metals*** *– Antimony, Arsenic, Barium, Cadmium, Chromium III&VI, Cobalt, Copper, Lead, Manganese, Mercury, Molybdenum, Nickel, Tin and Zinc* ***Petroleum Carbon Ranges*** *– Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35* ***Volatile Organic Compounds (VOCs)*** *– Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;* ***Semi-volatile Organic Compounds (SVOCs)*** *– Acenaphthene, Acenaphthylene, Anthracene,Benzo(a)anthracene,Benzo(a)pyrene, Benzo(b)fluoranthene,Benzo(g,h,i)perylene, Benzo(k)fluoranthene,Chrysene,Dibenzo(a,h)anthracene,Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene,Naphthalene,Phenanthrene, Phenol ,Pyrene* ***Polychlorinated Biphenyls (PCBs)***

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	16 MAY 2017 18:30	Document Received Date/Time:	16 MAY 2017 18:30
Sorting Date/ Time:	16 MAY 2017 19:30	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	(Yes) / No
Bottle information:	1 x (250ml R/G, 1L Orange, 250ml Blue) 2x 40ml VOCs vials		
Tray No:	R130, D2, V1, B32	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):
*Client Contact Name: Tel:
Email:
*Invoice address to:

*Purchase Order/ Client Order No:
* ALS Quotation No.: HK/5386/2016
*Project Name/No: **Queen's Hill Development - Sewage Pumping Station Works**
Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1719398

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:
*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days):** ☐ **Regular (7-10)** ☐ **#Express (5)** ☐ **#Double Express (3)** ☐ **#Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
01	Field blank	water	9 May 2017	*Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;*

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	- 9 MAY 2017 13:45	Document Received Date/Time:	- 9 MAY 2017 13:45
Sorting Date/ Time:	- 9 MAY 2017 14:40	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	2 x 40 ml VOCs vials		
Tray No:	V1	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com

*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com

*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: **TCS00862/16 - Queen's Hill Development - Sewage Pumping Station Works**

Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1720402
Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days): ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
①	Field blank	water	16 May 2017	*Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;*

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	16 MAY 2017 18:30	Document Received Date/Time:	16 MAY 2017 18:30
Sorting Date/ Time:	16 MAY 2017 19:30	Esky Count:	1 x cooler box
Condition:	Ambient / (Chilled) / Frozen	Ice Bricks / Ice	(Yes) / No
Bottle information:	2 x 40 ml VOCs vials		
Tray No:	V1	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

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 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

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*Invoice to (c/o company):
*Client Contact Name: Tel:
Email:
*Invoice address to:

*Purchase Order/ Client Order No:
* ALS Quotation No.: HK/5386/2016
*Project Name/No: Queen's Hill Development - Sewage Pumping Station Works
Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1717839
Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:
*Sample(s) delivery by: ☐ Client ☑ # ALS ☐ others: Hugo

***Expected TAT (Working days): ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1.	Trip blank	water	29 Apr 2017	*Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;*

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	- 2 MAY 2017 16:50	Document Received Date/Time:	- 2 MAY 2017 16:50
Sorting Date/ Time:	- 2 MAY 2017 17:00	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	2 x soil jar 40ml amber vials		
Tray No:	V1	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: lankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

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*Invoice to (c/o company):
*Client Contact Name: Tel:
Email:
*Invoice address to:

*Purchase Order/ Client Order No:
* ALS Quotation No.: HK/5386/2016
*Project Name/No: **Queen's Hill Development - Sewage Pumping Station Works**
Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1719402
Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:
*Sample(s) delivery by: ☐ Client ☐ # ALS ☐ others:

***Expected TAT (Working days):** ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
01	Trip blank	water	9 May 2017	*Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;*

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	- 9 MAY 2017 13:45	Document Received Date/Time:	- 9 MAY 2017 13:45
Sorting Date/ Time:	- 9 MAY 2017 14:40	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	2 x 40 ml amber vials		
Tray No:	V1	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

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*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com

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*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

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*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No.: ~~Queen's Hill Development - Sewage Pumping Station Works~~

Site Name (if any): ~~[illegible]~~ TCS00862/2016

ALS Technichem (HK) Pty Ltd
Work Order
HK1719579

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days): ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1.	Trip blank	water	10-5-17	*Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;*

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	11 MAY 2017 18:40	Document Received Date/Time:	11 MAY 2017 18:40
Sorting Date/ Time:	11 MAY 2017 19:10	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	2 x 40 ml amber vials		
Tray No:	V1	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: ~~Queen's Hill Development - Sewage Pumping Station Works~~

Site Name (if any): TCS00862/16

ALS Technichem (HK) Pty Ltd
Work Order
HK1719586

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days): ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1.	Trip blank	water	11-5-17	*Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;*

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	11 MAY 2017 18:40	Document Received Date/Time:	11 MAY 2017 18:40
Sorting Date/ Time:	11 MAY 2017 19:10	Esky Count:	1x cooler box
Condition:	Ambient / (Chilled) / Frozen	Ice Bricks / Ice	(Yes) / No
Bottle information:	2 x 40 ml amber vials		
Tray No:	V1	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

*Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.*
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

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*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com

*Client Contact Name (2nd): JAN KWOK Email: jankwok@fordbusiness.com

*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: **TCS00862/16 - Queen's Hill Development - Sewage Pumping Station Works**

Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1720401

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days):** ☐ **Regular (7-10)** ☐ **#Express (5)** ☐ **#Double Express (3)** ☐ **#Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
①	Trip blank	water	16 May 2017	***Volatile Organic Compounds (VOCs)** – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;*

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	16 MAY 2017 18:30	Document Received Date/Time:	16 MAY 2017 18:30
Sorting Date/ Time:	16 MAY 2017 19:30	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	2 x 40 ml amber vials		
Tray No:	V1	Sort by:	

Groundwater Sample
(Suspected Carpark/Workshop)

Cheimcal Results Summary of Groundwater Sample at Carpark/Workshop with QA/QC

Chemicals of Concern		Industrial of RBRGs (mg/L)	Solubility Limit (mg/L)	Reporting Limit	Unit	SPS-02-1	SPS-02-2	SPS-02-3	SPS-02-4	SPS-02-5	Duplicate	Equipment Blank	Field Blank	Trip Blank
Heavy Metal	Mercury	6.79E+00	NA	0.5	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N/A	N/A
Polychlorinated Biphenyls (PCBs)	Total Polychlorinated biphenyls	5.11E+00	3.10E-02	1	ug/L	<1	<1	<1	<1	<1	<1	<1	N/A	N/A
Semi-Volatile Organic Compounds (SVOCs)	Naphthalene	8.62E+02	3.10E+01	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A	N/A
	Acenaphthylene	1.00E+04*	3.93E+00	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A	N/A
	Acenaphthene	1.00E+04*	4.24E+00	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A	N/A
	Fluorene	1.00E+04*	1.98E+00	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A	N/A
	Phenanthrene	1.00E+04*	1.00E+00	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A	N/A
	Anthracene	1.00E+04*	4.34E-02	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A	N/A
	Fluoranthene	1.00E+04*	2.06E-01	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A	N/A
	Pyrene	1.00E+04*	1.35E-01	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	N/A	N/A
	Chrysene	8.12E+02	1.60E-03	1	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	N/A	N/A
	Benzo(b)fluoranthene	7.53E+00	1.50E-03	1	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	N/A	N/A
Petroleum Carbon Ranges	C6 – C8 Fraction	1.15E+03	5.23E+00	20	ug/L	<20	<20	<20	<20	<20	<20	<20	N/A	N/A
	C9 – C16 Fraction	9.98E+03	2.80E+00	500	ug/L	<500	<500	<500	<500	<500	<500	<500	N/A	N/A
	C17 – C35 Fraction	1.78E+02	2.80E+00	500	ug/L	<500	<500	800	600	1500	<500	<500	N/A	N/A
Volatile Organic Compounds (VOCs)	Benzene	5.40E+01	1.75E+03	5	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Toluene	1.00E+04*	5.26E+02	5	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Ethylbenzene	1.00E+04*	1.69E+02	5	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Xylenes (Total)	1.57E+03	1.75E+02	20	ug/L	<20	<20	<20	<20	<20	<20	<20	<20	<20
	2-Propanone (Acetone)	1.00E+04*	***	500	ug/L	<500	<500	<500	<500	<500	<500	<500	<500	<500
	Trichloroethene	1.42E+01	1.10E+03	5	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Methyl tert-Butyl Ether (MTBE)	1.81E+03	***	5	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Remarks: 1mg = 1000µg

(*) Indicates a 'ceiling limit' concentration.

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

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 9
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1722314
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: Twtam@fordbusiness.com	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORKS	Quote number	: HK/5386/2016	Date Samples Received	: 26-MAY-2017
Order number	: ----			Issue Date	: 07-JUN-2017
C-O-C number	: ----			No. of samples received	: 6
Site	: ----			No. of samples analysed	: 6

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 26-MAY-2017 to 06-JUN-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1722314

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Water sample(s) were filtered prior to dissolved metal analysis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID	SPS-02-1	SPS-02-2	SPS-02-3	SPS-02-4	SPS-02-5
				Client sampling date / time	[26-MAY-2017]	[26-MAY-2017]	[26-MAY-2017]	[26-MAY-2017]	[26-MAY-2017]
					HK1722314-001	HK1722314-002	HK1722314-003	HK1722314-004	HK1722314-005
EG: Metals and Major Cations - Filtered									
EG020: Mercury	7439-97-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EP-066: Polychlorinated Biphenyls									
Total Polychlorinated biphenyls	----	1	µg/L		<1	<1	<1	<1	<1
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Acenaphthylene	208-96-8	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Acenaphthene	83-32-9	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Fluorene	86-73-7	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Phenanthrene	85-01-8	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Anthracene	120-12-7	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Fluoranthene	206-44-0	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Pyrene	129-00-0	2.0	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)									
C6 - C8 Fraction	----	20	µg/L		<20	<20	<20	<20	<20
C9 - C16 Fraction	----	500	µg/L		<500	<500	<500	<500	<500
C17 - C35 Fraction	----	500	µg/L		<500	<500	**800**	**600**	**1500**
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)									
Benzene	71-43-2	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
Toluene	108-88-3	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
Ethylbenzene	100-41-4	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L		<10	<10	<10	<10	<10
ortho-Xylene	95-47-6	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
Xylenes (Total)	----	20	µg/L		<20	<20	<20	<20	<20
EP-074_SR-B: Oxygenated Compounds									
2-Propanone (Acetone)	67-64-1	500	µg/L		<500	<500	<500	<500	<500
EP-074_SR-E: Halogenated Aliphatics									
Trichloroethene	79-01-6	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP-074_SR-I: Methyl-tert-butyl Ether									
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L		<5.0	<5.0	<5.0	<5.0	<5.0
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**52.8**	**67.6**	**82.8**	**59.4**	**66.6**
4-Terphenyl-d14	1718-51-0	0.1	%		**95.2**	**98.6**	**98.5**	**95.5**	**92.8**
EP-066S: PCB Surrogate									
Tetrachlorometaxylene	877-09-8	0.1	%		**55.6**	**54.4**	**64.6**	**54.2**	**51.0**
Dibutylchlorendate	1770-80-5	0.1	%		**116**	**119**	**120**	**116**	**118**

Sub-Matrix: **WATER**

Compound	*CAS Number*	*LOR*	*Unit*	*Client sample ID* / *Client sampling date / time*	SP2-02-1 [26-MAY-2017]	SP2-02-2 [26-MAY-2017]	SP2-02-3 [26-MAY-2017]	SP2-02-4 [26-MAY-2017]	SP2-02-5 [26-MAY-2017]
					HK1722314-001	HK1722314-002	HK1722314-003	HK1722314-004	HK1722314-005
EP-080_SRS: TPH(Volatile)/BTEX Surrogate									
Dibromofluoromethane	1868-53-7	0.1	%		**91.0**	**91.0**	**90.2**	**90.3**	**91.6**
Toluene-D8	2037-26-5	0.1	%		**96.6**	**98.0**	**98.4**	**99.4**	**96.9**
4-Bromofluorobenzene	460-00-4	0.1	%		**95.6**	**93.4**	**94.8**	**99.3**	**96.8**
EP-074_SR-S: VOC Surrogates									
Dibromofluoromethane	1868-53-7	0.1	%		**91.0**	**91.0**	**90.2**	**90.3**	**91.6**
Toluene-D8	2037-26-5	0.1	%		**96.6**	**98.0**	**98.4**	**99.4**	**96.9**
4-Bromofluorobenzene	460-00-4	0.1	%		**95.6**	**93.4**	**94.8**	**99.3**	**96.8**

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: DUPLICATE				
Client sampling date / time				[26-MAY-2017]				
				HK1722314-006				
EG: Metals and Major Cations - Filtered								
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5				
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	1	µg/L	<1				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	2.0	µg/L	<2.0				
Acenaphthylene	208-96-8	2.0	µg/L	<2.0				
Acenaphthene	83-32-9	2.0	µg/L	<2.0				
Fluorene	86-73-7	2.0	µg/L	<2.0				
Phenanthrene	85-01-8	2.0	µg/L	<2.0				
Anthracene	120-12-7	2.0	µg/L	<2.0				
Fluoranthene	206-44-0	2.0	µg/L	<2.0				
Pyrene	129-00-0	2.0	µg/L	<2.0				
Chrysene	218-01-9	1.0	µg/L	<1.0				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20				
C9 - C16 Fraction	----	500	µg/L	<500				
C17 - C35 Fraction	----	500	µg/L	<500				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**57.0**				
4-Terphenyl-d14	1718-51-0	0.1	%	**89.6**				
EP-066S: PCB Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	**53.2**				
Dibutylchlorendate	1770-80-5	0.1	%	**119**				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
Dibromofluoromethane	1868-53-7	0.1	%	**90.6**				

Sub-Matrix: **WATER**

Compound	*CAS Number*	*LOR*	*Unit*	*Client sample ID*: **DUPLICATE**				
				Client sampling date / time: [26-MAY-2017]				
				HK1722314-006				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate - Continued								
Toluene-D8	2037-26-5	0.1	%	**98.2**				
4-Bromofluorobenzene	460-00-4	0.1	%	**94.6**				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**90.6**				
Toluene-D8	2037-26-5	0.1	%	**98.2**				
4-Bromofluorobenzene	460-00-4	0.1	%	**94.6**				

Laboratory Duplicate (DUP) Report

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EG: Metals and Major Cations - Filtered (QC Lot: 4488719)								
HK1721576-003	Anonymous	**EG020: Mercury**	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
HK1722225-004	Anonymous	**EG020: Mercury**	7439-97-6	0.1	µg/L	<0.1	<0.1	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4488719)											
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	94.4	----	77	117	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4488519)											
Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	118	----	64	150	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4488932)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	74.0	----	31	102	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	73.3	----	31	105	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	73.7	----	32	93	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	78.4	----	33	100	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	82.3	----	30	107	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	76.3	----	28	108	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	87.7	----	56	121	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	87.9	----	56	125	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	74.9	----	57	117	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	83.4	----	71	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4487374)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	90.9	----	54	104	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	91.6	----	61	125	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4487447)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	84.9	----	63	127	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4489018)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	88.2	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	106	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	91.1	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	90.4	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	95.8	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	92.2	----	86	123	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4489019)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	90.4	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	109	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	91.4	----	84	120	----	----

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4489019) - Continued											
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	90.0	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	95.4	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	91.8	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4489018)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	102	----	65	140	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4489019)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	111	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4489018)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	95.0	----	68	121	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4489019)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	96.8	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4489018)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	85.3	----	65	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4489019)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	98.4	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4488719)										
HK1721576-002	Anonymous	**EG020: Mercury**	7439-97-6	2 µg/L	92.7	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

Sub-Matrix: **WATER**

Compound	*CAS Number*	*Recovery Limits (%)* *Low*	*High*
EP-080_SRS: TPH(Volatile)/BTEX Surrogate - Continued			
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 4
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1722306
Address	: RM A 20/F., GOLD KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T. HONG KONG	Address	: 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
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Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORKS	Quote number	: HK/5386/2016	Date Samples Received	: 26-MAY-2017
Order number	: ----			Issue Date	: 07-JUN-2017
C-O-C number	: ----			No. of samples received	: 2
Site	: ----			No. of samples analysed	: 2

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	**Manager - Organics**	**Organics**

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 26-MAY-2017 to 02-JUN-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1722306

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: FIELD BLANK Client sampling date / time: [26-MAY-2017] HK1722306-001	Client sample ID: TRIP BLANK Client sampling date / time: [26-MAY-2017] HK1722306-002			
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0	<5.0			
Toluene	108-88-3	5.0	µg/L	<5.0	<5.0			
Ethylbenzene	100-41-4	5.0	µg/L	<5.0	<5.0			
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10	<10			
ortho-Xylene	95-47-6	5.0	µg/L	<5.0	<5.0			
Xylenes (Total)	----	20	µg/L	<20	<20			
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500	<500			
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0	<5.0			
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0	<5.0			
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**91.0**	**90.2**			
Toluene-D8	2037-26-5	0.1	%	**98.6**	**97.6**			
4-Bromofluorobenzene	460-00-4	0.1	%	**94.7**	**93.4**			

Laboratory Duplicate (DUP) Report

- No Laboratory Duplicate (DUP) Results are required to be reported.

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4489018)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	88.2	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	106	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	91.1	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	90.4	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	95.8	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	92.2	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4489018)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	102	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4489018)											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	95.0	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4489018)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	85.3	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066 TEST

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	Laboratory	: ALS Technichem (HK) Pty Ltd	Page	: 1 of 6
Contact	: MR T W TAM	Contact	: Fung Lim Chee, Richard	Work Order	: HK1722311
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Project	: TCS 00862_16 - QUEEN S HILL DEVELOPMENT SEWAGE PUMPING STATION WORKS	Quote number	: HK/5386/2016	Date Samples Received	: 26-MAY-2017
Order number	: ----			Issue Date	: 07-JUN-2017
C-O-C number	: ----			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

Hong Kong Accreditation Service (HKAS) has accredited this laboratory, ALS Technichem (HK) Pty Ltd (Reg. No. HOKLAS 066) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories.

This document has been signed by those names that appear on this report and are the authorised signatories.

Signatories	*Position*	*Authorised results for*
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics

General Comments

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release. When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Testing period is from 26-MAY-2017 to 06-JUN-2017.

Key: LOR = Limit of reporting; CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

Specific Comments for Work Order: HK1722311

Sample(s) were received in chilled condition.

Water sample(s) analysed and reported on an as received basis.

Water sample(s) were filtered prior to dissolved metal analysis.

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: EQUIPMENT BLANK Client sampling date / time: [26-MAY-2017] HK1722311-001				
EG: Metals and Major Cations - Filtered								
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5				
EP-066: Polychlorinated Biphenyls								
Total Polychlorinated biphenyls	----	1	µg/L	<1				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	2.0	µg/L	<2.0				
Acenaphthylene	208-96-8	2.0	µg/L	<2.0				
Acenaphthene	83-32-9	2.0	µg/L	<2.0				
Fluorene	86-73-7	2.0	µg/L	<2.0				
Phenanthrene	85-01-8	2.0	µg/L	<2.0				
Anthracene	120-12-7	2.0	µg/L	<2.0				
Fluoranthene	206-44-0	2.0	µg/L	<2.0				
Pyrene	129-00-0	2.0	µg/L	<2.0				
Chrysene	218-01-9	1.0	µg/L	<1.0				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0				
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH)								
C6 - C8 Fraction	----	20	µg/L	<20				
C9 - C16 Fraction	----	500	µg/L	<500				
C17 - C35 Fraction	----	500	µg/L	<500				
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH)								
Benzene	71-43-2	5.0	µg/L	<5.0				
Toluene	108-88-3	5.0	µg/L	<5.0				
Ethylbenzene	100-41-4	5.0	µg/L	<5.0				
meta- & para-Xylene	108-38-3 106-42-3	10	µg/L	<10				
ortho-Xylene	95-47-6	5.0	µg/L	<5.0				
Xylenes (Total)	----	20	µg/L	<20				
EP-074_SR-B: Oxygenated Compounds								
2-Propanone (Acetone)	67-64-1	500	µg/L	<500				
EP-074_SR-E: Halogenated Aliphatics								
Trichloroethene	79-01-6	5.0	µg/L	<5.0				
EP-074_SR-I: Methyl-tert-butyl Ether								
Methyl tert-Butyl Ether (MTBE)	1634-04-4	5.0	µg/L	<5.0				
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**75.8**				
4-Terphenyl-d14	1718-51-0	0.1	%	**122**				
EP-066S: PCB Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	**50.2**				
Dibutylchlorendate	1770-80-5	0.1	%	**115**				

Sub-Matrix: **WATER**			*Client sample ID*	**EQUIPMENT BLANK**				
			Client sampling date / time	[26-MAY-2017]				
Compound	*CAS Number*	*LOR*	*Unit*	**HK1722311-001**				
EP-080_SRS: TPH(Volatile)/BTEX Surrogate								
Dibromofluoromethane	1868-53-7	0.1	%	**90.2**				
Toluene-D8	2037-26-5	0.1	%	**99.1**				
4-Bromofluorobenzene	460-00-4	0.1	%	**94.1**				
EP-074_SR-S: VOC Surrogates								
Dibromofluoromethane	1868-53-7	0.1	%	**90.2**				
Toluene-D8	2037-26-5	0.1	%	**99.1**				
4-Bromofluorobenzene	460-00-4	0.1	%	**94.1**				

Laboratory Duplicate (DUP) Report

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				
				LOR	Unit	Original Result	Duplicate Result	RPD (%)
EG: Metals and Major Cations - Filtered (QC Lot: 4488719)								
HK1721576-003	Anonymous	**EG020: Mercury**	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
HK1722225-004	Anonymous	**EG020: Mercury**	7439-97-6	0.1	µg/L	<0.1	<0.1	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
					Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
		LOR	Unit	Result		LCS	DCS	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4488719)											
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	94.4	----	77	117	----	----
EP-066: Polychlorinated Biphenyls (QC Lot: 4488519)											
Total Polychlorinated biphenyls	----	1	µg/L	<1	10 µg/L	118	----	64	150	----	----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 4488932)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	74.0	----	31	102	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	73.3	----	31	105	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	73.7	----	32	93	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	78.4	----	33	100	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	82.3	----	30	107	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	76.3	----	28	108	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	87.7	----	56	121	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	87.9	----	56	125	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	74.9	----	57	117	----	----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	83.4	----	71	119	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4487374)											
C9 - C16 Fraction	----	0.5	mg/L	<0.5	0.21 mg/L	90.9	----	54	104	----	----
C17 - C35 Fraction	----	0.5	mg/L	<0.5	0.45 mg/L	91.6	----	61	125	----	----
EP-071HK_SR: Total Petroleum Hydrocarbons (TPH) (QC Lot: 4487447)											
C6 - C8 Fraction	----	0.02	mg/L	<0.02	0.03 mg/L	84.9	----	63	127	----	----
EP-074_SR-A: Monocyclic Aromatic Hydrocarbons (MAH) (QC Lot: 4489018)											
Benzene	71-43-2	0.5	µg/L	<0.5	2 µg/L	88.2	----	67	130	----	----
Toluene	108-88-3	0.5	µg/L	<0.5	2 µg/L	106	----	76	127	----	----
Ethylbenzene	100-41-4	0.5	µg/L	<0.5	2 µg/L	91.1	----	84	120	----	----
meta- & para-Xylene	108-38-3 106-42-3	1	µg/L	<1	4 µg/L	90.4	----	80	128	----	----
ortho-Xylene	95-47-6	0.5	µg/L	<0.5	2 µg/L	95.8	----	84	125	----	----
Xylenes (Total)	----	2	µg/L	<2	6 µg/L	92.2	----	86	123	----	----
EP-074_SR-B: Oxygenated Compounds (QC Lot: 4489018)											
2-Propanone (Acetone)	67-64-1	5	µg/L	<5	20 µg/L	102	----	65	140	----	----
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4489018)											

Matrix: WATER

Method: Compound	CAS Number	Method Blank (MB) Report LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report: Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EP-074_SR-E: Halogenated Aliphatics (QC Lot: 4489018) - Continued											
Trichloroethene	79-01-6	0.5	µg/L	<0.5	2 µg/L	95.0	----	68	121	----	----
EP-074_SR-I: Methyl-tert-butyl Ether (QC Lot: 4489018)											
Methyl tert-Butyl Ether (MTBE)	1634-04-4	0.5	µg/L	<0.5	2 µg/L	85.3	----	65	121	----	----

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report: Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 4488719)										
HK1721576-002	Anonymous	**EG020: Mercury**	7439-97-6	2 µg/L	92.7	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: WATER

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	321-60-8	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-066S: PCB Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130
EP-080_SRS: TPH(Volatile)/BTEX Surrogate			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115
EP-074_SR-S: VOC Surrogates			
Dibromofluoromethane	1868-53-7	86	118
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com

Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com

*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com

*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):

*Client Contact Name: Tel:

Email:

*Invoice address to:

*Purchase Order/ Client Order No:

* ALS Quotation No.: HK/5386/2016

*Project Name/No: **TCS00862/16 - Queen's Hill Development - Sewage Pumping Station Works**

Site Name (if any):

ALS Technichem (HK) Pty Ltd

Work Order

HK1722314

Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:

*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days): ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1	SPS-02-1	Water	26/5/17	***Metals*** *–Mercury* ***Petroleum Carbon Ranges*** *– Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35* ***Volatile Organic Compounds (VOCs)*** *– Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;* ***Semi-volatile Organic Compounds (SVOCs)***– *Acenaphthene, Acenaphthylene, Anthracene, Benzo(b)fluoranthene, Chrysene ,Fluoranthene ,Fluorene, Naphthalene ,Phenanthrene ,Pyrene* ***Polychlorinated Biphenyls (PCBs)***
2	SPS-02-2	"	"	
3	SPS-02-3	"	"	
4	SPS-02-4	"	"	
5	SPS-02-5	"	"	
6	Duplicate	"	"	

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	26 MAY 2017 16:50	Document Received Date/Time:	26 MAY 2017 16:50
Sorting Date/ Time:	26 MAY 2017 18:00	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	6 x (250ml R/G, 1L Orange), 12 x 40ml amber vials		
Tray No:	R139, D3, V2.	Sort by:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):
*Client Contact Name: Tel:
Email:
*Invoice address to:

*Purchase Order/ Client Order No:
* ALS Quotation No.: HK/5386/2016
*Project Name/No: TCS00862/16 - Queen's Hill Development - Sewage Pumping Station Works
Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1722311
Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:
*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days): ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, ____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1.	Equipment Blank	Water	26/5/2017	*Metals –Mercury* *Petroleum Carbon Ranges – Fractions C6-C8, Fractions C9-C16 and Fractions C17-C35* *Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;* *Semi-volatile Organic Compounds (SVOCs)–* *Acenaphthene, Acenaphthylene, Anthracene, Benzo(b)fluoranthene, Chrysene ,Fluoranthene ,Fluorene, Naphthalene ,Phenanthrene ,Pyrene* *Polychlorinated Biphenyls (PCBs)*

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	26 MAY 2017 16:40	Document Received Date/Time:	26 MAY 2017 16:40
Sorting Date/ Time:	26 MAY 2017 18:00	Esky Count:	1 x cooler box
Condition:	Ambient / Chilled / Frozen	Ice Bricks / Ice	Yes / No
Bottle information:	1 x (250ml R/G, 1L Orange), 2 x 40ml (amber vials		
Tray No:	R139, 03-V2.	Sort By:	

ALS Technichem (HK) Pty Ltd
11/F, Chung Shun Knitting Centre, 1-3 Wing Yip St, Kwai Chung, N.T., Hong Kong
Tel : (852) 2610 1044 Fax : (852) 2610 2021 Email: hongkong@alsglobal.com

SAMPLE SUBMISSION FORM (Environmental test)

Note : * The following information is required to expedite sample analysis. Please complete all the necessary details and return this form with your samples. Test(s) will not be started until a COMPLETED form is received.
 # Items will be subject to additional charge and needed further confirmation & arrangement.

Reporting information for Final Report

*Company Name: AUES

*Client Contact: Name: TW TAM Email: twtam@fordbusiness.com
Tel: Fax:

*Report address to:

*Postal Address (if different):

Soft copy report delivery (if different from above)

*Client Contact Name (1st): BEN TAM Email: bentam@fordbusiness.com
*Client Contact Name (2nd): JAN KWOK Email: Jankwok@fordbusiness.com
*Client Contact Name (3rd): MARTIN LI martinli@fordbusiness.com

Billing information for Invoice (if different from reporting information for final report)

Note : Client Name on invoice will be the company Name of the Final report.

*Invoice to (c/o company):
*Client Contact Name: Tel:
Email:
*Invoice address to:

*Purchase Order/ Client Order No:
* ALS Quotation No.: HK/5386/2016
*Project Name/No: **TCS00862/16 - Queen's Hill Development - Sewage Pumping Station Works**
Site Name (if any):

ALS Technichem (HK) Pty Ltd
Work Order
HK1722306
Telephone : +852 2610 1044

Sampling and delivery

Sampling by: ☑ Client ☐ # ALS ☐ others:
*Sample(s) delivery by: ☑ Client ☐ # ALS ☐ others:

***Expected TAT (Working days): ☐ Regular (7-10) ☐ #Express (5) ☐ #Double Express (3) ☐ #Other (____)**

Other remark:

SAMPLE ANALYTICAL REQUIREMENTS (Supplementary sheet attached ☐ Yes, _____ pages ☐ No)

Lab ID (Lab use only)	*Sample ID.	Matrix	*Sampling Date/Time	*Analysis Required (Tests)
1.	Field Blank	water	26-5-17	*Volatile Organic Compounds (VOCs) – Acetone, Benzene, Toluene, Ethylbenzene, Xylenes (Total), Methyl tert-Butyl Ether, and Trichloroethene;*
2.	Trip Blank	water	26-5-17	

SAMPLE RECEIVE INFO: (Lab Use Only)

Received Date/ Time:	26 MAY 2017 16:50	Document Received Date/Time:	26 MAY 2017 16:50
Sorting Date/ Time:	26 MAY 2017 18:00	Esky Count:	1 x cooler box
Condition:	Ambient / (Chilled) / Frozen	Ice Bricks / Ice	(Yes) / No
Bottle information:	4 x 40 ml amber vials		
Tray No:	V2	Sort by:	

Appendix H

Comparison of RPD Values among the Soil and Groundwater Duplicates

Relative Percent Difference Summary of the Orginal and Duplicate Samples (Soil and Water)

Chemical Parameter	Soil Sample						Water Sample		
	SPS-01-3/ 1.5m bgl (CLP Substation)		RPD (%)	SPS-02-2/ 0.5m bgl (Car Workshop)		RPD (%)	SPS-02-1		RPD (%)
	Orginal Sample (mg/kg)	Duplicate Sample (mg/kg)		Orginal Sample (mg/kg)	Duplicate Sample (mg/kg)		Orginal Sample (µg/L)	Duplicate Sample (µg/L)	
Antimony	--	--	--	<1	<1	NA	--	--	--
Arsenic	20.0	22	9%	8	11	22.20%	--	--	--
Barium	--	--	--	80	84	4.80%	--	--	--
Cadmium	<0.2	<0.2	NA	0.2	0.2	0%	--	--	--
Cobalt	--	--	--	2	2	0%	--	--	--
Copper	--	--	--	20	25	22.20%	--	--	--
Lead	--	--	--	93	71	17.10%	--	--	--
Manganese	--	--	--	118	138	10.60%	--	--	--
Mercury	<0.05	<0.05	NA	0.09	0.17	61.50%	<0.5	<0.5	NA
Molybdenum	--	--	--	1	2	66%	--	--	--
Nickel	3.0	14	129%	5	5	0%	--	--	--
Tin	--	--	--	3	4	25%	--	--	--
Zinc	--	--	--	218	225	3.10%	--	--	--
Trivalent Chromium	6.0	6	0%	20	15	18.10%	--	--	--
Hexavalent Chromium	<1	<1	NA	<1	<1	NA	--	--	--
Total Polychlorinated biphenyls	<0.1	<0.1	NA	<0.1	<0.1	NA	<1	<1	NA
Naphthalene	<0.5	<0.5	NA	<0.5	<0.5	NA	<2.0	<2.0	NA
Acenaphthylene	--	--	--	<0.5	<0.5	NA	<2.0	<2.0	NA
Acenaphthene	--	--	--	<0.5	<0.5	NA	<2.0	<2.0	NA
Fluorene	--	--	--	<0.5	<0.5	NA	<2.0	<2.0	NA
Phenanthrene	--	--	--	<0.5	<0.5	NA	<2.0	<2.0	NA
Anthracene	--	--	--	<0.5	<0.5	NA	<2.0	<2.0	NA
Fluoranthene	--	--	--	<0.5	<0.5	NA	<2.0	<2.0	NA
Pyrene	--	--	--	<0.5	<0.5	NA	<2.0	<2.0	NA
Benz(a)anthracene	--	--	--	<0.5	<0.5	NA	--	--	--
Chrysene	--	--	--	<0.5	<0.5	NA	<1.0	<1.0	NA
Benzo(b)fluoranthene	--	--	--	<0.5	<0.5	NA	<1.0	<1.0	NA
Benzo(k)fluoranthene	--	--	--	<0.5	<0.5	NA	--	--	--
Benzo(a)pyrene	--	--	--	<0.5	<0.5	NA	--	--	--
Indeno(1.2.3.cd)pyrene	--	--	--	<0.5	<0.5	NA	--	--	--
Dibenz(a.h)anthracene	--	--	--	<0.5	<0.5	NA	--	--	--
Benzo(g.h.i)perylene	--	--	--	<0.5	<0.5	NA	--	--	--
Phenol	<0.5	<0.5	NA	N/A	N/A	NA	--	--	--
C6 – C8 Fraction	<5	<5	NA	<5	<5	NA	<20	<20	NA
C9 – C16 Fraction	<200	<200	NA	<200	<200	NA	<500	<500	NA
C17 – C35 Fraction	<500	<500	NA	<500	<500	NA	<500	<500	NA
Benzene	<0.2	<0.2	NA	<0.2	<0.2	NA	<5.0	<5.0	NA
Toluene	<0.5	<0.5	NA	<0.5	<0.5	NA	<5.0	<5.0	NA
Ethylbenzene	<0.5	<0.5	NA	<0.5	<0.5	NA	<5.0	<5.0	NA
Xylenes (Total)	<2.0	<2.0	NA	<2.0	<2.0	NA	<20	<20	NA
2-Propanone (Acetone)	--	--	--	<50	<50	NA	<500	<500	NA
Trichloroethene	--	--	--	<0.1	<0.1	NA	<5.0	<5.0	NA
Methyl tert-Butyl Ether (MTBE)	<1	<1.0	NA	<0.5	<0.5	NA	<5.0	<5.0	NA

The Relative Percent Difference (RPD) $\% = \dfrac{(\text{Result 1} - \text{Result 2}) \times 100}{\text{Mean of Results 1 \& 2}}$

Appendix I

Trial Pit and Drill Hole Records

GEOTECH ENGINEERING LIMITED

CONTRACT NO. : **CV/2016/08**

PROJECT : **Queen's Hill Development - Sewage Pumping Station Works**

WORKS ORDER NO. :

PREPARED BY : **Henry Yip**

DATE : **27/04/2017**

CO-ORDINATES :
E **833,945.00**
N **840,760.00**

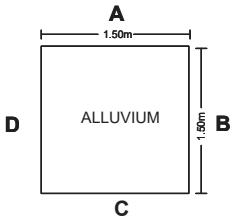
GROUND LEVEL : **+11.49** m.P.D.
EXCAVATION DATE : **25/04/2017** to **26/04/2017**
BACKFILL DATE : **28/04/2017** to **28/04/2017**

TRIAL PIT NO. : **SPS-01-1**

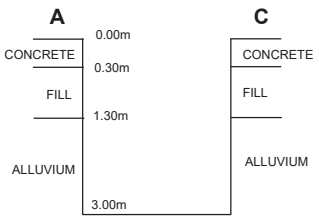
TRIAL PIT RECORD

Samples & Tests	Depth (m)	Sketch (Face A : 1.50 m / Face B : 1.50 m / Face C : 1.50 m / Face D : 1.50 m)	Depth (m)	Legend (Face D)	Weathering Grade	Description
	0		0			CONCRETE SLAB.
	0.30		0.30			
1 2						Greyish brown, sandy SILT with some coarse gravel sized rock fragments. (FILL)
	1		1			
	1.30		1.30			
3 4						Reddish brown, silty CLAY. (ALLUVIUM)
	2		2			
5 6	3.00		3.00			
	3		3			
	4		4			
	5		5			

PLAN



SECTION (NOT TO SCALE)



SYMBOL

- Small Disturbed Sample
- Large Disturbed Sample
- Undisturbed Sample Hori. ( )
- Undisturbed Sample Vert. ( )
- Block Sample
- Insitu Density Test
- Water Sample
- Schmidt Hammer Test
- Seepage

REMARKS

TRIAL PIT NO. **SPS-01-1**

GEOTECH ENGINEERING LIMITED

CONTRACT NO. : **CV/2016/08**

PROJECT : **Queen's Hill Development - Sewage Pumping Station Works**

WORKS ORDER NO. :

PREPARED BY : **Henry Yip**

DATE : **27/04/2017**

CO-ORDINATES :
E **833,945.00**
N **840,766.00**

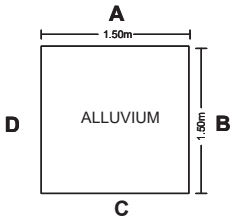
GROUND LEVEL : **+11.52** m.P.D.
EXCAVATION DATE : **25/04/2017** to **26/04/2017**
BACKFILL DATE : **28/04/2017** to **28/04/2017**

TRIAL PIT NO. : **SPS-01-2**

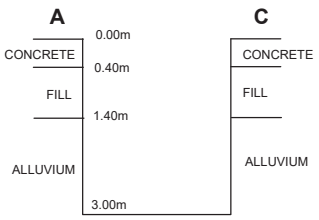
TRIAL PIT RECORD

Samples & Tests	Depth (m)	Sketch (Face A : 1.50 m / Face B : 1.50 m / Face C : 1.50 m / Face D : 1.50 m)	Depth (m)	Legend (Face D)	Weathering Grade	Description
	0		0			CONCRETE SLAB.
	0.40		0.40			
1 2						Greyish brown, sandy SILT with some coarse gravel sized rock fragments. (FILL)
	1		1			
	1.40		1.40			
3 4						Reddish brown, silty CLAY. (ALLUVIUM)
	2		2			
	3.00		3.00			
5 6	3		3			
	4		4			
	5		5			

PLAN



SECTION (NOT TO SCALE)



SYMBOL

- Small Disturbed Sample
- Large Disturbed Sample
- Undisturbed Sample Hori. ( )
- Undisturbed Sample Vert. ( )
- Block Sample
- Insitu Density Test
- Water Sample
- Schmidt Hammer Test
- Seepage

REMARKS

TRIAL PIT NO. **SPS-01-2**

GEOTECH ENGINEERING LIMITED

CONTRACT NO. : **CV/2016/08**

PROJECT : **Queen's Hill Development - Sewage Pumping Station Works**

WORKS ORDER NO. :

PREPARED BY : **Henry Yip**

DATE : **27/04/2017**

CO-ORDINATES :
E **833,953.00**
N **840,763.00**

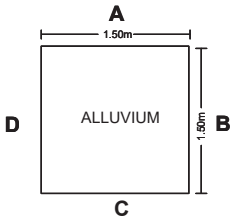
GROUND LEVEL : **+11.51** m.P.D.
EXCAVATION DATE : **25/04/2017** to **26/04/2017**
BACKFILL DATE : **28/04/2017** to **28/04/2017**

TRIAL PIT NO. : **SPS-01-3**

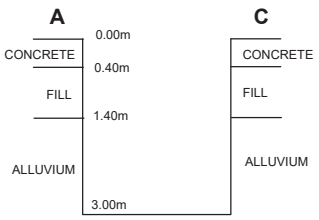
TRIAL PIT RECORD

Samples & Tests	Depth (m)	Sketch (Face A : 1.50 m / Face B : 1.50 m / Face C : 1.50 m / Face D : 1.50 m)	Depth (m)	Legend (Face D)	Weathering Grade	Description
	0		0			CONCRETE SLAB.
	0.40		0.40			
1 2	1		1			Greyish brown, sandy SILT with some coarse gravel sized rock fragments. (FILL)
	1.40		1.40			
3 4	2		2			Reddish brown, silty CLAY. (ALLUVIUM)
	3.00		3.00			
5 6	3		3			
	4		4			
	5		5			

PLAN



SECTION (NOT TO SCALE)



SYMBOL

- Small Disturbed Sample
- Large Disturbed Sample
- Undisturbed Sample Hori. ( )
- Undisturbed Sample Vert. ( )
- Block Sample
- Insitu Density Test
- Water Sample
- Schmidt Hammer Test
- Seepage

REMARKS

TRIAL PIT NO. **SPS-01-3**

GEOTECH ENGINEERING LIMITED

DRILLHOLE RECORD

HOLE NO. **SPS-02-1**

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

SHEET **1** of **1**

PROJECT **Queen's Hill Development - Sewage Pumping Station Works**

METHOD **RC**	CO-ORDINATES **E 834,004.00 N 840,741.00**	W.O. No.
MACHINE & NO. **XY2B**		DATE: **05/05/2017** to **11/05/2017**
	ORIENTATION **VERTICAL**	REFERENCE LEVEL **+11.46** mPD

Drilling Progress	Casing size	Water level (m) Shift start/ end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
5.5.17	HX							1 • 0.50 2 • 1.50 3 • 3.00 4 • 4.50		4.500			Dark greyish brown, sandy SILT with some coarse gravel sized rock fragments. (FILL)
11.5.17	HX 4.50												End of Investigation hole at 4.50m.

- Small Disturbed Sample
- Piston Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test / BHTV
- Packer Test
- Piezometer Tip
- Standpipe Tip

LOGGED **Henry Yip**

DATE **12/05/2017**

REMARKS

GEOTECH ENGINEERING LIMITED	DRILLHOLE RECORD	HOLE NO. SPS-02-2
	CONTRACT NO. **CV/2016/08**	SHEET **1** of **1**

PROJECT **Queen's Hill Development - Sewage Pumping Station Works**

METHOD **RC**	CO-ORDINATES **E 834,013.00 N 840,740.00**	W.O. No.
MACHINE & NO. **XY2B**		DATE: **05/05/2017** to **11/05/2017**
	ORIENTATION **VERTICAL**	REFERENCE LEVEL **+11.89** mPD

Drilling Progress	Casing size	Water level (m) Shift start/ end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
0 5.5.17	HX							1 • 0.50					Dark greyish brown, sandy SILT with some coarse gravel sized rock fragments. (FILL)
1								2 • 1.50					
2													
3								3 • 3.00					
4 11.5.17	HX 4.50							4 • 4.50		4.500			
5													End of Investigation hole at 4.50m.
6													
7													
8													
9													
10													

- Small Disturbed Sample
- Piston Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test / BHTV
- Packer Test
- Piezometer Tip
- Standpipe Tip

LOGGED **Henry Yip**

DATE **12/05/2017**

REMARKS

GEOTECH ENGINEERING LIMITED

DRILLHOLE RECORD

HOLE NO. **SPS-02-3**

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

SHEET **1** of **1**

PROJECT **Queen's Hill Development - Sewage Pumping Station Works**

METHOD **RC**	CO-ORDINATES **E 834,012.00 N 840,729.00**	W.O. No.
MACHINE & NO. **XY2B**		DATE: **05/05/2017** to **11/05/2017**
	ORIENTATION **VERTICAL**	REFERENCE LEVEL **+11.92** mPD

Drilling Progress	Casing size	Water level (m) Shift start/ end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
5.5.17	HX							1 • 0.50 2 • 1.50 3 • 3.00 4 • 4.50		4.500			Dark greyish brown, sandy SILT with some coarse gravel sized rock fragments. (FILL)
11.5.17	HX 4.50												End of Investigation hole at 4.50m.

- Small Disturbed Sample
- Piston Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test / BHTV
- Packer Test
- Piezometer Tip
- Standpipe Tip

LOGGED **Henry Yip**

DATE **12/05/2017**

REMARKS

GEOTECH ENGINEERING LIMITED

DRILLHOLE RECORD

HOLE NO. **SPS-02-4**

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

SHEET **1** of **1**

PROJECT **Queen's Hill Development - Sewage Pumping Station Works**

METHOD **RC**	CO-ORDINATES **E 834,004.00 N 840,733.00**	W.O. No.
MACHINE & NO. **XY2B**		DATE: **05/05/2017** to **11/05/2017**
	ORIENTATION **VERTICAL**	REFERENCE LEVEL **+11.63** mPD

Drilling Progress	Casing size	Water level (m) Shift start/ end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
5.5.17	HX							1 • 0.50 2 • 1.50 3 • 3.00 4 • 4.50		4.500			Dark greyish brown, sandy SILT with some coarse gravel sized rock fragments. (FILL)
11.5.17	HX 4.50												End of Investigation hole at 4.50m.

- Small Disturbed Sample
- Piston Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test / BHTV
- Packer Test
- Piezometer Tip
- Standpipe Tip

LOGGED **Henry Yip**

DATE **12/05/2017**

REMARKS

GEOTECH ENGINEERING LIMITED

DRILLHOLE RECORD

HOLE NO. SPS-02-5

CONTRACT NO. CV/2016/08

SHEET 1 of 1

PROJECT Queen's Hill Development - Sewage Pumping Station Works

METHOD RC

MACHINE & NO. XY2B

CO-ORDINATES
E 834,019.00
N 840,726.00

ORIENTATION VERTICAL

W.O. No.

DATE: 16/05/17 to 16/05/17

REFERENCE LEVEL +11.94 mPD

Drilling Progress	Casing size	Water level (m) Shift start/ end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
16.5.17	HX							1 @ 0.50					Dark greyish brown, sandy SILT with some coarse gravel sized rock fragments. (FILL)
								2 @ 1.50					
								3 @ 3.00					
16.5.17	HX 4.50							4 @ 4.50		4.500			End of Investigation hole at 4.50m.

- Small Disturbed Sample
- Piston Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test / BHTV
- Packer Test
- Piezometer Tip
- Standpipe Tip

LOGGED Henry Yip

DATE 16/05/17

REMARKS