FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Report No.: 0041/17/ED/0116E

Methodology for Sediment Quality Monitoring and Benthic Survey

Client : Drainage Services Department

Project : Contract No. CM 14/2016
Environmental Team for Operational Environmental Monitoring and Audit for Siu Ho Wan Sewage Treatment Works

Prepared by: Andy K. H. Choi

Reviewed by: Cyrus C. Y. Lai

Certified by:

Colin K. L. Yung
Environmental Team Leader
Fugro Technical Services Limited

Allied Environmental Consultants Limited
Acousticians & Environmental Engineers

19/F., Kwan Chart Tower, 6 Tonnochy Road, Wan Chai, Hong Kong
Tel.: (852) 2815 7028 Fax: (852) 2815 5399 Email: info@aechk.com

沛然環境評估工程顧問有限公司

Our Ref: 1458/17-0048

27 October 2017

By Post and E-mail

Drainage Services Department
Projects and Development Branch
Consultants Management Division
42/F, Revenue Tower,
5 Gloucester Road,
Wan Chai, Hong Kong

Attn: Mr. CHUNG Ching Hong, Romeo (E/CM9)

Dear Sir,

RE: CONTRACT NO. CM 13/2016
INDEPENDENT ENVIRONMENTAL CHECKER FOR OPERATIONAL ENVIRONMENTAL MONITORING AND AUDIT FOR SIU HO WAN SEWAGE TREATMENT WORKS (SHWSTW)
METHODOLOGIES FOR WATER QUALITY MONITORING, SEDIMENT QUALITY MONITORING AND BENTHIC SURVEY

Reference is made to the submission of *Methodologies for Water Quality Monitoring (MWQM)* (Report No.: 0041/17/ED/0117E) and the *Methodologies for Sediment Quality Monitoring and Benthic Survey (MSQM&BS)* (Report No.: 0041/17/ED/0116E) submitted by Environmental Team (ET) of the captioned Project, Messrs. Fugro Technical Services Limited, via email dated 25 October 2017.

The followings are noted:

1) In principle, it is observed that the proposed monitoring methodologies follow sections 5.1 to 5.4, and 6.1 to 6.4 of the approved Operational Environmental Monitoring and Audit (OEM&A) Plan of the Project;
2) Alternative methods are proposed for (i) the use of tidal gauge for water quality monitoring, (ii) laboratory analytical method for particle size distribution, and (iii) sediment sample storage for sediment quality monitoring, as presented in Section 3.2.4 of the MWQM, Table 3.3 and Section 3.4.2 of MSQM&BS, respectively;
3) For the alternative methods that are not specified on the OEM&A Plan (e.g. tidal condition of the sampling exercise, number of replicate per sample, etc.), it is noted that the Operational EM&A Report (September 2009) of the Project has been reviewed by the ET, which had been verified by previous IEC (Drainage Services Department Agreement No. SHW-IEC/2006/01), and are summarised in Table 3.1 of MWQM and MSQM&BS.

Based on the above, we have no adverse comment on the proposed methodologies in principle and hereby verify the same. Please be reminded that approval of the methodologies should be obtained from EPD prior to commencing the monitoring.

Notwithstanding, it is suggested the ET to review the information presented on the OEM&A Plan of the Project and check if any update is required.

Should you have any queries, please feel free to contact the undersigned, or our Mr. Rodney IP at 2815 7028.

Yours faithfully,

For and on behalf of
Allied Environmental Consultants Ltd.

Grace KWOK
Independent Environmental Checker

GK/ri/rc

c.c.	Fugro Technical Services (ET Leader)	Attn: Mr. Colin YUNG	(by E-mail)
	AECOM	Attn: Ms. Joanne TSOI	(by E-mail)

FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.
Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

TABLE OF CONTENTS

FIGURE

APPENDICES

1. Introduction

1.1 The Project "Upgrading of Siu Ho Wan Sewage Treatment Works" is to upgrade the Siu Ho Wan Sewage Treatment Works (STW) from the preliminary treatment level to chemically enhanced primary treatment (CEPT) level with UV disinfection facilities. The Project is required to comply with Environmental Permit in respect of the construction and operation phases of the Plant.

1.2 Under the Environmental Impact Assessment Ordinance, the Project was classified as "Designated Project". The Environmental Impact Assessment (EIA) study was completed in September 1997 with the EIA Report of Register No. EIAR-124BC and Environmental Monitoring and Audit (EM&A) Manual, and the Environmental Permit (EP) of No. EP-076/2000 was issued in August 2000 to Drainage Services Department (DSD).

1.3 The CEPT part has been completed and was put into operation in March 2005. The UV disinfection works were substantially completed in December 2006. It is considered that the operation of the Project shall be deemed to start when the UV disinfection facilities have been completely installed and tested.

1.4 The project proponent was Drainage Services Department (DSD). AECOM was commissioned by DSD as the Engineer for the Project. Allied Environmental Consultants Limited (AEC) was commissioned by DSD as the Independent Environmental Checker (IEC) in the operation phase of the Project. Fugro Technical Services Limited (FTS) was appointed as the Environmental Team (ET) by DSD to implement the EM&A programme for the operation phase of the Project.

1.5 In this document, methodology of the proposed sediment quality monitoring and benthic survey programme is presented, which shall be followed in accordance with the approved Operational EM&A plan.

2. Objectives

2.1 The objective of the sediment quality monitoring and benthic survey programme is to:

- collect data for future reference.

2.2 In accordance with Section 6 of the EM&A Plan, sediment quality monitoring and benthic survey should be carried out at 8 designated monitoring locations (2 impact stations and 6 control stations) during the first five years of the operational phase of the Project. The proposed monitoring locations shall be the same monitoring locations that were used for the baseline monitoring programme, subject to the approval of the Director of Environmental Protection. The coordinates of the monitoring location is shown in **Table 2.1**. The monitoring locations of sediment quality monitoring and benthic survey are also shown in **Figure 1**.

Table 2.1 Location of Sediment Quality Monitoring and Benthic Survey

Sampling Location		Easting	Northing
A	The Brothers, Control Station	816 100	822 500
B	The Brothers, Control Station	816 680	822 440
C	Siu Ho Wan Outfall, Impact Station	816 800	820 180
D	Siu Ho Wan Outfall, Impact Station	817 160	820 360
E	Cheung Sok, Control Station	819 817	821 655
F	Cheung Sok, Control Station	820 158	821 922
G	Tai Ching Chau, Control Station	822 214	822 692
H	Tai Ching Chau, Control Station	822 494	822 939

3. Methodology of Sediment Quality Monitoring and Benthic Survey

3.1 This methodology is proposed in accordance with the Section 6.1 to 6.4 from the approved Operational EM&A plan. As the tidal condition and number of samples to be collected of each sampling event was not specified in the OEM&A plan, thus they are proposed to be referenced from the previous OEM&A report (September 2009) in this methodology. The proposed frequency of methodology of Sediment Quality Monitoring and Benthic Survey as referenced in OEM&A report (September 2009) was summarized in **Table 3.1**. All the referenced information in the previous OEM&A report (September 2009) was verified by the previous IEC. The relevant sections which referenced from previous OEM&A report (September 2009) and the verification letter from previous IEC was shown in **Appendix C**.

Table 3.1 Summary of Proposed Monitoring Frequency Referenced from Previous OEM&A Report

Monitoring Parameter	Sampling Frequency		Relevant Sections in OEM&A Report in September 2009	Reasons
	Requirements need to be approved	Proposed method		
Sediment Quality	Tidal Condition of Each Sampling	Can be either ebb tide or flood tide	i) Section 6.10 - Sediment Quality Monitoring and Benthic Survey ii) Annex D – Full Laboratory Results Data	1. The requirement of tidal condition of each sampling and no. of samples to be collected is not specified in the OEM&A plan section 6.4 – Other Monitoring Requirements. 2. With reference to

Monitoring Parameter	Sampling Frequency		Relevant Sections in OEM&A Report in September 2009	Reasons
	Requirements need to be approved	Proposed method		
	No. of Samples to Be Collected at Each Monitoring Location	Single sample	i) Section 6.10 - Sediment Quality Monitoring and Benthic Survey ii) Annex D – Full Laboratory Results Data	OEM&A report (September 2009) Table 6-5 of Section 6.10 and Annex D, single sample was collected at each location during each sampling event and no sampling event at dual tide was observed in the report. Thus, collection of single sample at each location during each sampling event (either ebb tide or flood tide) is proposed in this methodology.
Benthic Survey	Tidal Condition of Each Sampling	Can be either ebb tide or flood tide	i) Section 6.14 & 6.15 - Sediment Quality Monitoring and Benthic Survey ii) Annex D – Full Laboratory Results Data	1. The requirement of tidal condition of each sampling and no. of samples to be collected is not specified in the OEM&A plan section 6.4 – Other Monitoring Requirements. 2. With reference to OEM&A report (September 2009) section 6.14 & 6.15 and Annex G, single sample was collected at each location (8 grabs at 8 stations) during each sampling event and no sampling event at dual tide was observed in the report. Thus, collection of single sample at each location during each sampling event (either ebb tide or flood) is proposed in this methodology.
	No. of Samples to Be Collected at Each Monitoring Location	Single sample	i) Section 6.14 & 6.15 - Sediment Quality Monitoring and Benthic Survey ii) Annex G – Benthic Data Summary Report	

3.2 Monitoring Parameter

3.2.1 The monitoring parameters for sediment quality monitoring and benthic survey are summarized in **Table 3.2**.

Table 3.2 Parameters for Sediment Quality Monitoring and Benthic Survey

Monitoring Parameters	
Sediment Quality Monitoring	**Rinsate Blank for Benthic Survey**
Grain size profit* (i.e. Particle Size Distribution) (%)	Cadmium (µg/L)
Total organic carbon* (%)	Chromium (µg/L)
pH value	Copper (µg/L)
Ammonia as N (mg-N/kg)	Lead (µg/L)
Total nitrogen (mg-N/kg)	Mercury ((µg/L)
Total phosphorus (mg-N/kg)	Nickel (µg/L)
Cadmium (mg/kg)	Zinc (µg/L)
Chromium (mg/kg)	Arsenic (µg/L)
Copper (mg/kg)	Silver (µg/L)
Lead (mg/kg)	
Mercury (mg/kg)	
Nickel (mg/kg)	
Zinc (mg/kg)	
Arsenic (mg/kg)	
Silver (mg/kg)	

*Grain size profile and total organic carbon is determined from the sediment sampled collected for benthic survey.

3.2.2 Apart from the parameters listed in the **Table 3.2**, other relevant supplementary information such as monitoring location, time, weather conditions and any special phenomena shall be also recorded.

3.2.3 The tidal data will be obtained from the tide gauge installed in Ma Wan Marine Traffic Station, managed by the Hydrographic Office of Marine Department.

3.3 Sampling Equipment

3.3.1 Ponar grab sampler (capacity of ~ 1 litre) shall be used for collection of samples for sediment analysis. The grab shall be capable of collecting sufficient amount of surificial (top 5 cm) sediment for the required analysis in a single deployment at each sampling location. The grab shall be constructed with non-contaminating material to prevent sample contamination. Photos of ponar grab sampler are shown in **Appendix A**.

3.3.2 A modified Van Veen grab sampler (capacity of ~ 11.3 litres) shall be used for collecting sediment samples for benthic survey. The top of the grab shall have openings to allow the easy flow of water through the grab as it descends. The openings shall be covered with 0.5 mm mesh to prevent the loss of any benthic fauna once a sediment sample is taken. In addition the top openings shall be sealable by movable flaps which shall close when the grab is hauled to surface. Photos of modified Van Veen grab sampler are shown in **Appendix B**.

3.3.3 Class III commercially licensed vessel was used as survey vessel. DGPS logging device in the ADCP with accuracy ±1m at 95% confidence level shall be installed on the survey vessel to ascertain that measurement can be made accurately on the specific transects. All GPS data collected during the whole survey shall be automatically and electronically logged. Powered winch shall be used on-board the Survey Vessel to

assist the monitoring. 4 fixed sieve stations shall be equipped on Survey Vessel. Experienced supervisor was present throughout the monitoring exercise on the Survey Vessel.

3.4 Sampling Procedure

Benthic Survey, Particle Size Distribution and TOC Analysis

3.4.1 A modified Van Veen grab sampler (capacity of ~ 11.3 litres) shall be deployed at each of the benthic survey locations to collect single grab sample at each location. The grab sampler should be lowered through the water column slowly at a constant rate (approximately 30 cm/s) to prevent the formation of a pressure wave that may disturb surficial deposits. The grab will then be retrieved and evaluated on board of the survey vessel. Any sample showing uneven penetration or only partially filled with sediment shall be rejected. Samples will be placed in a plastic box with an identification card. Sub-samples (approximately 1 kg) should be splitted up for analysis of particle size distribution and TOC. The remaining sediment samples should be washed gently to separate the benthic organisms and the sediment using a watering hose with marine seawater supply, by a sieve stack (comprising 1 mm and 0.5 mm meshes). Benthic organisms remaining on the sieve should be removed into pre-labeled ziplock plastic bags. A 10% solution of buffered formalin containing Rose Bengal in seawater will be added to the bag to ensure tissue preservation. Samples will be sealed in plastic containers for transport to the laboratory for sorting and identification of benthic organisms.

Sediment Quality Monitoring (Except Particle Size Distribution and TOC Analysis)

3.4.2 Ponar grab sampler (capacity of ~ 1 litres) shall be deployed at each of the benthic survey locations to collect single grab sample at each location. The grab sampler should be lowered through the water column slowly at a constant rate (approximately 30 cm/s) to prevent the formation of a pressure wave that may disturb surficial deposits. The grab will then be retrieved and evaluated on board of the survey vessel. Any sample showing uneven penetration or only partially filled with sediment shall be rejected. Samples will be placed in a plastic box with an identification card. Sediment samples will be then transferred into brand new soil jars with QA/QC monitoring for laboratory analysis. Samples shall be preserved and stored in accordance with approved SOP of HOKLAS accredited laboratory and the recommendations stipulated in ETWB TC (W) No. 34/2002.

3.4.3 Sediment samples shall be collected and packed in ice (cooled to 4°C without being frozen), and delivered to the laboratory on the same day of collection for analysis.

3.5 Laboratory Measurement and Analysis

3.5.1 ALS Technichem (HK) Pty Ltd (HOKLAS Reg. No. 066), is appointed to be the laboratory for analysis of sediment samples. The methods adopted by the laboratories and the reporting limits are detailed in **Table 3.3**.

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Table 3.3 Laboratory Measurement/Analysis Methods and Reporting Limits

Analysis Description	Method	Reporting limits
Particle Size Distribution	Geospec 3: 2001 Test method 8.1, 8.5 and 8,7 (Wet Sieve and Hydrometer Method)	1%
Total Organic Carbon	APHA 5310B	0.05%
pH value	APHA 4500H: B	0.1 pH unit
Ammonia as N	APHA 4500 NH3: B&G	0.5 mg/L
Total Nitrogen	APHA 4500 Norg: D & APHA 4500 NO3: I	10 mg/L
Total Phosphorus	APHA 4500P: B&H	10 mg/L
Cadmium	USEPA 6020A Digestion method: 3051A	0.1 mg/L
Chromium		0.5 mg/L
Copper		0.2 mg/L
Lead		0.2 mg/L
Mercury		0.05 mg/L
Nickel		0.2 mg/L
Zinc		0.5 mg/L
Arsenic		0.5 mg/L
Silver		0.1 mg/L

3.6 Taxonomic Identification of Benthic Organism

3.6.1 Taxonomic identification of benthic organisms will be performed using stereo dissecting and high-power compound microscopes where it is necessary. Benthic organisms will be counted and identified to lower taxonomic levels as far as practicable with biomass (wet weight, to 0.01gram) of each individual recorded. If breakage of soft-bodied organism occurs, only anterior portions of fragments will be counted, although all fragments will be retained and weighted for biomass determinations (wet weight, to 0.01gram). Data of species abundance and biomass will be recorded.

3.6.2 Data collected during surveys will be presented and summarized in tables and graphics. Species/taxon richness and abundance of marine benthic fauna communities will be analyzed by Shannon-Weiner diversity and Pielou's Evenness.

3.7 Monitoring Frequency and Duration

3.7.1 The sediment quality monitoring and benthic survey programmed shall be carried out once per two months for a period of five years of the operational phase of the Project. Since the purpose of the sediment quality monitoring and benthic survey is to collect data for future reference, only a single round of sediment quality monitoring and benthic survey at 8 designated locations will be carried out for each monitoring event. For each location, only a single sample will be taken and analyzed.

3.8 Quality Assurance / Quality Control

3.8.1 A rinsate blank shall be collected in each monitoring location before each sediment sampling for benthic survey, so as to monitor the effectiveness of field decontamination procedure.

3.8.2 The laboratory incorporates a variety of QA/QC monitoring programme into their testing system. Where applicable or available, the quality of the analysis will be monitored by conducting the following QC analysis:

For each batch of 20 samples:

- A minimal of 1 laboratory method blank will be analyzed;
- A minimal of 1 sample duplicate will be analyzed;
- A minimal of 1 sample matrix spike will be analyzed.

4. Event and Action Plan

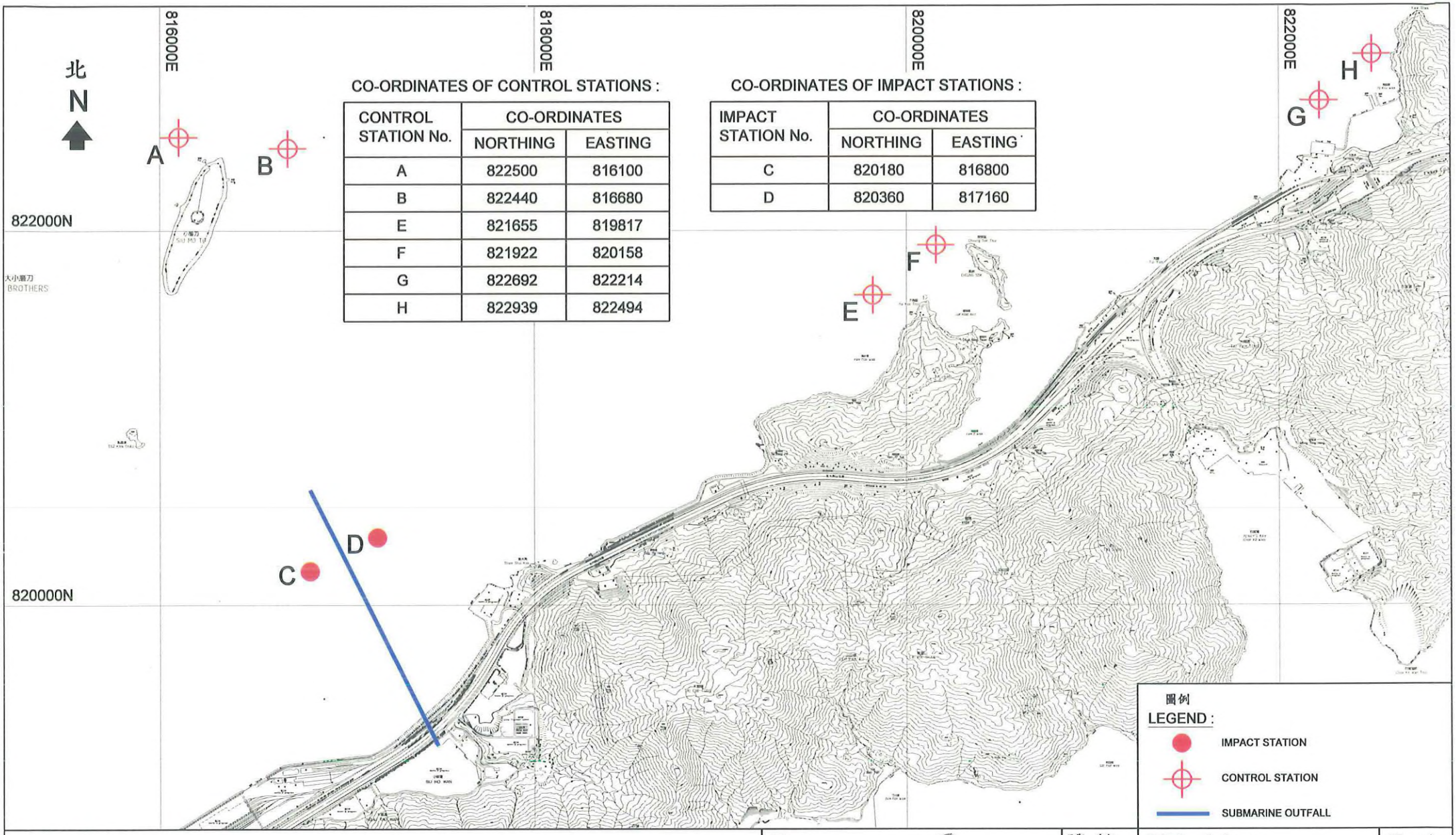
4.1.1 Since the purpose of the sediment quality monitoring and benthic survey is to collect data for future propose, no specific event and action has to be followed.

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Figure 1
Monitoring Location of Sediment Quality Monitoring and Benthic Survey



CO-ORDINATES OF CONTROL STATIONS :

CONTROL STATION No.	CO-ORDINATES	
	NORTHING	EASTING
A	822500	816100
B	822440	816680
E	821655	819817
F	821922	820158
G	822692	822214
H	822939	822494

CO-ORDINATES OF IMPACT STATIONS :

IMPACT STATION No.	CO-ORDINATES	
	NORTHING	EASTING
C	820180	816800
D	820360	817160

圖例
LEGEND :

- IMPACT STATION
- CONTROL STATION
- SUBMARINE OUTFALL

圖則名稱 drawing title

UPGRADING OF SIU HO WAN SEWAGE TREATMENT PLANT
BASELINE MONITORING - LOCATION OF MONITORING STATIONS

繪畫 drawn	H.K. LAI	日期 date 06-02-2004
核對 checked	C.K. LAM	日期 date 04-03-2004
批核 approved	S.K. WONG	日期 date 04-03-2004
部門 office	顧問工程管理部 CONSULTANTS MANAGEMENT DIVISION	

圖則編號 drawing no. DCM/2004/002

比例 scale N.T.S.

香港特別行政區政府渠務署
DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE
HONG KONG
SPECIAL ADMINISTRATIVE REGION

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Appendix A
Photos of Ponar Grab Sampler

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Report No.: 0041/17/ED/0116E

Photo 1. A polar grab sampler

Photo 2. Grab dimension 1

Photo3. Grab dimension 2

Photo4. Grab dimension 3

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Appendix B
Photos of Modified Van Veen Grab Sampler

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Report No.: 0041/17/ED/0116E

Photo 1. A modified Van Veen grab sampler

Photo 2. Grab dimension 1

Photo3. Grab dimension 2

Photo4. Grab dimension 3

FUGRO TECHNICAL SERVICES LIMITED

Fugro Development Centre,
5 Lok Yi Street, Tai Lam,
Tuen Mun, N.T.,
Hong Kong.

Tel : +852 2450 8233
Fax : +852 2450 6138
E-mail : matlab@fugro.com
Website : www.fugro.com

Appendix C
Reference Sections of the Previous OEM&A Report

8/4777405/88

Encl.	30
Ans. to	
Ans. by	

CH2MHILL

西圖香港有限公司

CH2M HILL Hong Kong Limited
2/F, Shui On Centre
6-8 Harbour Road
Wanchai, Hong Kong
Tel (852) 2507-2203
Fax (852) 2507-2293

Our Ref.: DSDSHWOPEM00/0/0139

Date: 28 October 2010

Drainage Services Department
Projects and Development Branch
Consultants Management Division
42/F, Revenue Tower,
5 Gloucester Road,
Wan Chai, Hong Kong

By Fax (2827 8526) and Post

Attn: Mr. S. K. Wong (SE/CM1)

Dear Mr. Tsui,

Re: Agreement No. SHW-IEC/2006/01
Upgrading of Siu Ho Wan Sewage Treatment Plant – Environmental Monitoring and Audit in Operation Phase
Operational Monthly EM&A Report – January 2009 (Rev 7), February 2009 (Rev 5), March 2009 to June 2009 (Rev 4), July 2009 (Rev 3), August 2009 (Rev 4) and September 2009 (Rev 2)

Reference is made to ET's submissions for the captioned report (ref. January 2009 (Rev. 7), February 2009 (Rev. 5), March 2009 (Rev. 4), April 2009 (Rev. 4), May 2009 (Rev. 4), June 2009 (Rev. 4), July 2009 (Rev. 3), August 2009 (Rev. 4) and September 2009 (Rev. 2)) by hand on 27 October 2010.

Please be informed that we have no further comments except air quality (odour) monitoring.

It is understood that the project proponent has carried out further enhancement works, including the installation of additional odour removal facilities, to abate the emission of odourous gases and that the Siu Ho Wan Sewage Treatment Plant is still operating with flow below its designed maximum capacity, the previously monitoring data obtained will become invalid anymore. It is also understood that the project proponent will carry out further monitoring works to work out the odour performance. As such, these monitoring tests will not be verified anymore.

Should you have any queries, please feel free to contact Ms. Edith Ng at 3105 8525.

Y:\Individual Folder and Scanned doc\Scanned documents-auto-delete on sunday\DSDSHWOPEM00_0_0139.10.docx

西圖香港有限公司
CH2M HILL Hong Kong Limited
2/F, Shui On Centre
6-8 Harbour Road
Wanchai, Hong Kong
Tel (852) 2507-2203
Fax (852) 2507-2293

Yours sincerely,

Y.T. Tang
Independent Environmental Checker

c.c.	Mr. Matthew Tsui	AECOM	By Hand
	Mr. T W Tam	AUES (ETL)	By Fax: 2959 6079
	Mr. Alfred Wong	ATAL	By Fax: 2743 1059

Parameter	Detected Concentration		Sample detected with the highest concentration
	Max.	Min.	
Cadmium (Cd) (mg/kg):	Below the detection Limit		NA
Chromium (Cr) (mg/kg):	78	50	Station E
Copper (Cu) (mg/kg)	74	29	Station E
Nickel (Ni) (mg/kg)	40	26	Station F
Lead (Pb) (mg/kg)	51	31	Station F
Silver (Ag) (mg/kg)	0.7	0.2	Station F and H
Zinc (Zn) (mg/kg)	182	107	Station F
Arsenic (As) (mg/kg)	16	10	Station A
Mercury (Hg) (mg/kg)	0.17	0.06	Station E

6.09 Rinsate blank was collected to follow the Approved OEM&A Plan requirement for chemical analysis. All the parameters are found below the limit of report. The laboratory data results are provided in ***Annex D***.

6.10 The graphical plots of sediment grading size are provided in ***Annex E***. Based on the grading size of sediment, the simple describe of soil classification are logged in accordance with the "Guide to Rock and Soil Description" and presented in ***Table 6-5*** as follow:

Table 6-5 Simple Soil Classification of Sediment Samples

Sample ID	Grading Size (%)				Soil Group	Soil Description
	Clay	Silt	Sand	Gravel		
A	32	35	28	5	Fine	Wet light greenish sandy SILT/CLAY
B	33	41	25	1	Fine	Wet light greenish sandy SILT/CLAY
C	32	39	28	1	Fine	Wet light greenish sandy SILT/CLAY
D	29	36	32	3	Fine	Wet light greenish sandy SILT/CLAY
E	39	58	3	0	Fine	Wet light greenish slightly sandy clayey SILT
F	37	59	4	0	Fine	Wet light greenish slightly sandy clayey SILT
G	28	48	23	1	Fine	Wet light greenish slightly sandy clayey SILT
H	34	57	8	1	Fine	Wet light greenish slightly sandy clayey SILT

6.11 The weather condition in the sampling day on **28 September 2009** provided by the Hong Kong Observatory in past weather of monthly weather summary is presented in ***Table 6-6***.

Table 6-6 Weather Condition of Monitoring Day – 28 September2009

In-situ Observation	Discovery Bay	By In-situ Measurement	Peng Chau		Siu Ho Wan		Lok On Pai	
Weather	Total Rainfall (mm)	Sea Surf. Temp. (°C)	Mean Air Temp. (°C)	Mean Relative Humidity (%)	Mean Wind Speed (km/hr)	Prevailing Wind Direction (Degrees)	Estimate Time of High Tide	
							Flood	Ebb
Cloudy/ Rain/ squally thunderstorms/ Fresh/ strong	51.0	28.5	26.2	91	N/A#	N/A#	03:58 (2.0m)	12:53 (0.8m)

Notes: # Not available from HKO.

6.12 No special phenomena were observed during sediment sampling on **28 September 2009**. Normal traffic flow of vessel passing the monitoring area was reported by the sampling team.

BENTHIC SURVEY

6.13 The weather condition on **28 September 2009**, as extracted from Hong Kong Observatory's monthly weather summary, is summarized and presented in Table 6-6.

6.14 In this reporting month, total 8 pre-screening samples were delivered on the same day of benthic survey to the laboratory then shipped to Mainland China Ximan University for benthic survey. The process and reporting were performed by Professor Cai Lizhe.

Benthic Survey Results

6.15 According to Professor Cai Lizhe recording, a total of **175** specimens were obtained from the 8 grabs at 8 stations. They belong to 4 animal phyla. Some juveniles and fragments were not identified to genus or family level. **Eighteen** families and **twenty-two** genera were identified; most of them belonging to Annelida.

6.16 8 stations contained on average **21.9** specimens per station. The total biomass was **0.1937**g for all stations, with an average of **0.0242**g per station. The average individual wet weight was **1.1** mg/specimen.

6.17 A breakdown of the data by station (grab) reveals somewhat differences among station (grab) in terms of both number of specimens and biomass. The total number of specimens ranged from the lowest at station **G** (**7** specimens) to the highest at station **D** (**37** specimens). The average biomass value ranged from the lowest at station **G** (**0.007**g) to the highest at station A (**0.0596**g). The average size of a specimen, as determined by individual wet weight, was also very low among stations, with the lowest of **0.5** mg at station **F** and the highest of **1.7** mg at station A.

6.18 One species was considered dominant, if a species with more than 10 dividuals per station (grab). Some families in the datasheet contained more than 10 individuals, but these families contained more than one species and each species had less than 10 individuals.

6.19 The detailed benthic survey results are listed in the Benthic Data Summary Report, which is attached in ***Annex G***

ANNEX D

FULL LABORATORY RESULTS DATA

ALS Technichem (HK) Pty Ltd

PRELIMINARY REPORT FOR REFERENCE ONLY

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: ACTION UNITED ENVIRO SERVICES	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 6
Contact	: MR T W TAM	Contact	: Chan Kwok Fai, Godfrey	Work Order	: **HK0920636**
Address	: RM A 20/F., GOLDEN 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	: Godfrey.Chan@alsenviro.com		
Telephone	: +852 2959 6059	Telephone	: +852 2610 1044		
Facsimile	: +852 2959 6079	Facsimile	: +852 2610 2021		
Project	: TCS00295_05	Quote number	: HK/1291/2009 **	Date Samples Received	: 28-SEP-2009
Order number	: ----			Issue Date	: 27-OCT-2009 09:36
C-O-C number	: H010233			No. of samples received	: 8
Site	: SIU HO WAN			No. of samples analysed	: 8

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in the Electronic Transactions Ordinance of Hong Kong, Chapter 553, Section 6.

Signatories	*Position*	*Authorised results for*
Fung Lim Chee, Richard	**General Manager**	**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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client. The completion date of analysis is: 20-OCT-2009

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: **HK0920636**

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

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

pH determined and reported on a 1:5 soil / water extract.

Sediment sample(s) as received, digested by In-house method E-ASTM D3974-81 based on ASTM D3974-81, prior to the determination of metals.

Total Nitrogen is the sum of Total Oxidizable and Total Kjeldahl Nitrogen.

Analytical Results

Sub-Matrix: **MARINE SEDIMENT**

Compound	*CAS Number*	*LOR*	*Unit*	*Client sample ID* / *Client sampling date / time* A (ORIGINAL SAMPLE) [28-SEP-2009] HK0920636-001	B (ORIGINAL SAMPLE) [28-SEP-2009] HK0920636-002	C (ORIGINAL SAMPLE) [28-SEP-2009] HK0920636-003	D (ORIGINAL SAMPLE) [28-SEP-2009] HK0920636-004	E (ORIGINAL SAMPLE) [28-SEP-2009] HK0920636-005
EA/ED: Physical and Aggregate Properties								
EA002: pH Value	----	0.1	pH Unit	8.3	8.4	8.3	7.6	7.7
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	48.6	49.3	48.3	49.6	59.8
ED/EK: Inorganic Nonmetallic Parameters								
EK055: Ammonia as N	7664-41-7	10	mg/kg	<10	<10	<10	<10	<10
EK062: Total Nitrogen as N	----	20	mg/kg	696	964	933	891	1270
EK067: Total Phosphorus as P	----	20	mg/kg	424	400	2530	378	484
EG: Metals and Major Cations								
EG020: Arsenic	7440-38-2	1	mg/kg	16	13	10	10	13
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EG020: Chromium	7440-47-3	1	mg/kg	54	51	50	52	78
EG020: Copper	7440-50-8	1	mg/kg	38	41	33	29	74
EG020: Lead	7439-92-1	1	mg/kg	35	36	33	31	49
EG020: Mercury	7439-97-6	0.05	mg/kg	0.08	0.07	0.06	0.06	0.17
EG020: Nickel	7440-02-0	1	mg/kg	27	26	26	28	38
EG020: Silver	7440-22-4	0.1	mg/kg	0.4	0.5	0.3	0.2	0.6
EG020: Zinc	7440-66-6	1	mg/kg	120	119	109	107	163
EP: Aggregate Organics								
EP009: Total Organic Carbon	----	0.05	%	0.60	0.83	0.60	0.61	0.88

Sub-Matrix: MARINE SEDIMENT				Client sample ID	F (ORIGINAL SAMPLE)	G (ORIGINAL SAMPLE)	H (ORIGINAL SAMPLE)
				Client sampling date / time	[28-SEP-2009]	[28-SEP-2009]	[28-SEP-2009]
Compound	*CAS Number*	*LOR*	*Unit*		HK0920636-006	HK0920636-007	HK0920636-008
EA/ED: Physical and Aggregate Properties							
EA002: pH Value	----	0.1	pH Unit		7.8	8.0	8.2
EA055: Moisture Content (dried @ 103° C)	----	0.1	%		60.5	56.0	57.1
ED/EK: Inorganic Nonmetallic Parameters							
EK055: Ammonia as N	7664-41-7	10	mg/kg		<10	<10	<10
EK062: Total Nitrogen as N	----	20	mg/kg		1390	896	1090
EK067: Total Phosphorus as P	----	20	mg/kg		488	378	435
EG: Metals and Major Cations							
EG020: Arsenic	7440-38-2	1	mg/kg		13	12	12
EG020: Cadmium	7440-43-9	0.2	mg/kg		<0.2	<0.2	<0.2
EG020: Chromium	7440-47-3	1	mg/kg		76	64	69
EG020: Copper	7440-50-8	1	mg/kg		67	41	60
EG020: Lead	7439-92-1	1	mg/kg		51	38	42
EG020: Mercury	7439-97-6	0.05	mg/kg		0.13	0.08	0.08
EG020: Nickel	7440-02-0	1	mg/kg		40	34	34
EG020: Silver	7440-22-4	0.1	mg/kg		0.7	0.4	0.7
EG020: Zinc	7440-66-6	1	mg/kg		182	135	163
EP: Aggregate Organics							
EP009: Total Organic Carbon	----	0.05	%		0.90	0.68	0.73

Laboratory Duplicate (DUP) Report

Matrix: SOIL

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 1129247)								
HK0919759-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	25.2	25.6	1.8
HK0920636-002	B (ORIGINAL SAMPLE)	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	49.3	48.5	1.6
EA/ED: Physical and Aggregate Properties (QC Lot: 1130768)								
HK0919759-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	8.1	8.1	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1129984)								
HK0920519-002	Anonymous	EK067: Total Phosphorus as P	----	1	mg/kg	487	506	3.9
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1135555)								
HK0919759-003	Anonymous	EK055: Ammonia as N	7664-41-7	10	mg/kg	<10	<10	0.0
EG: Metals and Major Cations (QC Lot: 1127263)								
HK0920636-002	B (ORIGINAL SAMPLE)	EG020: Mercury	7439-97-6	0.05	mg/kg	0.07	0.07	0.0
		EG020: Silver	7440-22-4	0.1	mg/kg	0.5	0.5	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	13	13	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	51	56	9.1
		EG020: Copper	7440-50-8	1	mg/kg	41	43	4.8
		EG020: Lead	7439-92-1	1	mg/kg	36	36	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	26	28	5.9
		EG020: Zinc	7440-66-6	1	mg/kg	119	125	4.9
HK0920691-001	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Silver	7440-22-4	0.1	mg/kg	1.1	1.2	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.3	0.3	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	2	2	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	10	12	15.9
		EG020: Copper	7440-50-8	1	mg/kg	31	33	6.0
		EG020: Lead	7439-92-1	1	mg/kg	2	3	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	3	4	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	118	124	4.7
EP: Aggregate Organics (QC Lot: 1132705)								
HK0920636-003	C (ORIGINAL SAMPLE)	EP009: Total Organic Carbon	----	0.05	%	0.60	0.57	5.6
HK0920636-004	D (ORIGINAL SAMPLE)	EP009: Total Organic Carbon	----	0.05	%	0.61	0.58	5.0

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

Matrix: SOIL

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

Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1129984)											
EK067: Total Phosphorus as P	----	20	mg/kg	<20	695 mg/kg	90.9	----	85	115	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1135555)											

Matrix: SOIL

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

Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Spike Recovery (%) DCS	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1135555) - Continued											
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	10 mg/kg	92.8	----	85	115	----	----
EG: Metals and Major Cations (QC Lot: 1127263)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	94.0	----	85	115	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	92.7	----	85	115	----	----
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	109	----	85	115	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	102	----	85	115	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	92.6	----	85	115	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	85.2	----	85	115	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	104	----	85	115	----	----
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	89.6	----	85	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	111	----	85	115	----	----
EP: Aggregate Organics (QC Lot: 1132705)											
EP009: Total Organic Carbon	----	0.05	%	<0.05	40 %	101	----	85	115	----	----

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

Matrix: SOIL

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

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%) MS	Spike Recovery (%) MSD	Recovery Limits (%) Low	Recovery Limits (%) High	RPD (%) Value	RPD (%) Control Limit
EG: Metals and Major Cations (QC Lot: 1127263)										
HK0920636-001	A (ORIGINAL SAMPLE)	EG020: Arsenic	7440-38-2	5 mg/kg	81.7	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	90.9	----	75	125	----	----
		EG020: Chromium	7440-47-3	5 mg/kg	# Not Determined	----	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: Mercury	7439-97-6	0.1 mg/kg	88.5	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Silver	7440-22-4	5 mg/kg	85.2	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----
EP: Aggregate Organics (QC Lot: 1132705)										
HK0920636-001	A (ORIGINAL SAMPLE)	EP009: Total Organic Carbon	----	40 %	92.0	----	75	125	----	----

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

ALS TECHNICHEM (HK) Pty Ltd
Environmental Division

CERTIFICATE OF ANALYSIS

CONTACT:	MR BEN TAM	**Batch:**	HK0920636
CLIENT:	ACTION UNITED ENVIRO SERVICES	**Sub-batch:**	1
ADDRESS:	RM A, 20/F, GOLDEN KING IND BLDG, NO 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T.	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	28/09/2009
		DATE OF ISSUE:	23/10/2009
PROJECT ID:	TCS00295/05	**SAMPLE TYPE:**	SEDIMENT
SITE:	SIU HO WAN	**No. of SAMPLES:**	8

COMMENTS

Sample(s) were picked up from client by ALS Technichem (HK) staff in a chilled condition.
Sediment sample(s) analysed on an as received basis.
Particle size distribution (PSD) was subcontracted and tested by Geotechnics & Concrete Engineering (H.K.) Ltd.
GCE details report was attached. The attached report contains a total of 8 pages.

Sample Details

ALS Lab ID	*Sample ID*	*Date of Sampling*	*Test Parameter*
HK0920636001	A (ORIGINAL SAMPLE)	28/09/2009	PSD
HK0920636002	B (ORIGINAL SAMPLE)	28/09/2009	PSD
HK0920636003	C (ORIGINAL SAMPLE)	28/09/2009	PSD
HK0920636004	D (ORIGINAL SAMPLE)	28/09/2009	PSD
HK0920636005	E (ORIGINAL SAMPLE)	28/09/2009	PSD
HK0920636006	F (ORIGINAL SAMPLE)	28/09/2009	PSD
HK0920636007	G (ORIGINAL SAMPLE)	28/09/2009	PSD
HK0920636008	H (ORIGINAL SAMPLE)	28/09/2009	PSD

ISSUING LABORATORY: HONG KONG

Address
ALS Technichem (HK) Pty Ltd
11/F Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsenviro.com

Mr Chan Kwok Fai, Godfrey
Laboratory Manager - Hong Kong

Abbreviations: *% SPK REC denotes percentage spike recovery*
CHK denotes duplicate check sample
LOR denotes limit of reporting
LCS % REC denotes Laboratory Control Sample percentage recovery

REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION OF SOIL

IN ACCORDANCE WITH GEOSPEC 3 : 2001 TEST(S) 8.1 / 8.5 / 8.7

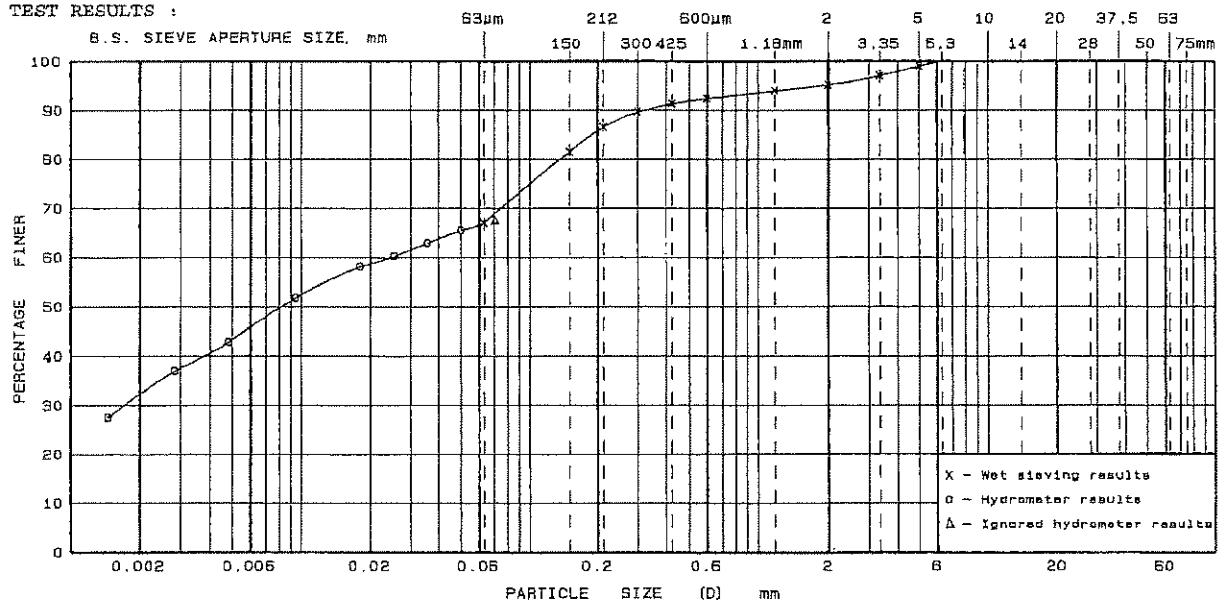
REPORT NO. : PSD09100052

CLIENT*	: ALS Technichem (HK) Pty Ltd	DATE RECEIVED	: 05/10/2009
SITE*	: --		
TEST LOCATION	: GROUND FLOOR, 20 PAK KUNG STREET, HUNG HOM, KOWLOON	DATE STARTED	: 09/10/2009
W.O. NO.*	: -- CONTRACT NO.* : --	DATE COMPLETED	: 15/10/2009
JOB NO.	: GCE/09/092 TEST UNIT NO. : S 09065	SAMPLE TYPE*	: BULK
HOLE NO.*	: -- SAMPLE NO.* : 1	SAMPLE DEPTH*	: -- m
DESCRIPTION	: Wet light greenish slightly sandy SILT/CLAY	SPEC. DEPTH*	: -- m

SAMPLE PREPARATION:

Procedure for sieving test : Method A

TEST RESULTS :



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COB-BLES
	SILT			SAND			GRAVEL			

The following information are only based on the opinion of the laboratory and are not under the scope of accreditation by HOKLAS :

ANALYSIS OF PARTICLE SIZE CURVE

Effective Diameter	(D_{10})	=	—	mm
Median Diameter	(D_{50})	=	0.0084	mm
Uniformity Coefficient	($U = D_{60}/D_{10}$)	=	—	

(Ref. : Clause 6.59(4) of General Specification for Civil Engineering Works (1992))

FINAL SUMMARY

CLAY	=	32 %
SILT	=	35 %
SAND	=	28 %
GRAVEL	=	5 %

Note : *Information provided by client
Remarks:HK0920636- 1

TESTED BY : W.N. CHAU	CHECKED BY : W.K. Chan	CERTIFIED BY : CHEUNG WING TAI
POST : Lab. Technician	POST : Reporting Officer	POST : Dept. Manager
DATE : 15/10/2009	DATE : 23/10/2009	DATE : 23/10/2009

REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION OF SOIL

IN ACCORDANCE WITH GEOSPEC 3 : 2001 TEST(S) 8.1 / 8.5 / 8.7

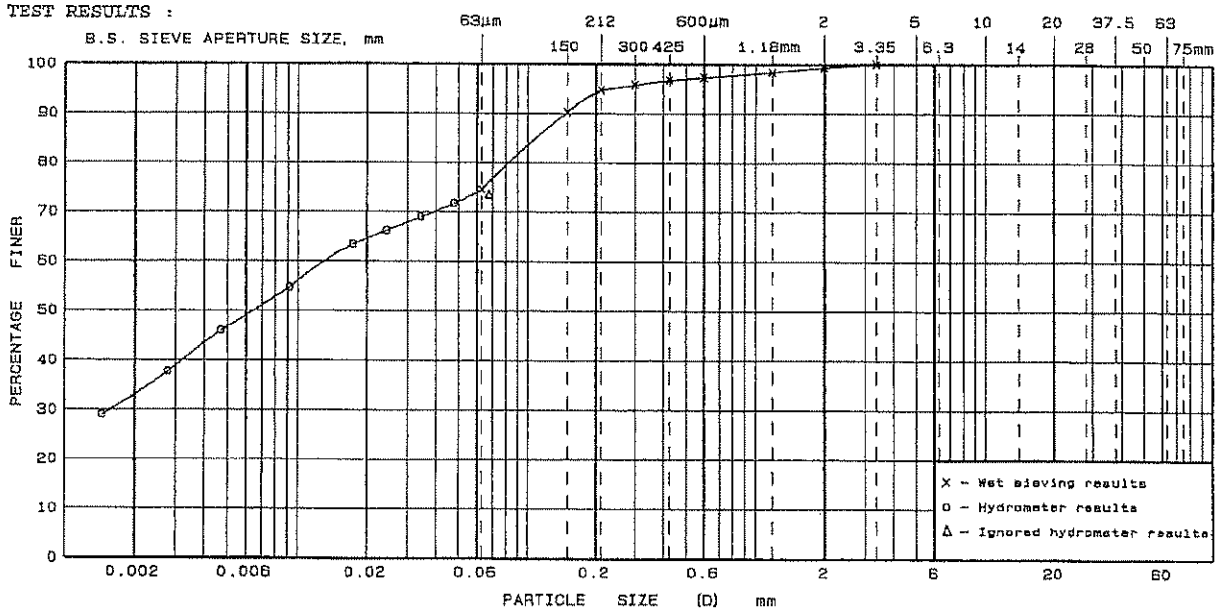
REPORT NO. : PSD09100053

CLIENT*	: ALS Technichem (HK) Pty Ltd	DATE RECEIVED	: 05/10/2009
SITE*	: --		
TEST LOCATION	: GROUND FLOOR, 20 PAK KUNG STREET, HUNG HOM, KOWLOON	DATE STARTED	: 09/10/2009
W.O. NO.*	: -- CONTRACT NO.* : --	DATE COMPLETED	: 15/10/2009
JOB NO.	: GCE/09/092 TEST UNIT NO. : S 09065	SAMPLE TYPE*	: BULK
HOLE NO.*	: -- SAMPLE NO.* : 2	SAMPLE DEPTH*	: -- m
DESCRIPTION	: Wet light greenish slightly sandy SILT/CLAY	SPEC. DEPTH*	: -- m

SAMPLE PREPARATION:

Procedure for sieving test : Method A

TEST RESULTS :



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COB-BLES
	SILT			SAND			GRAVEL			

The following information are only based on the opinion of the laboratory and are not under the scope of accreditation by HOKLAS :

ANALYSIS OF PARTICLE SIZE CURVE

Effective Diameter	(D_{10})	= —	mm
Median Diameter	(D_{50})	= 0.0066	mm
Uniformity Coefficient	($U = D_{60}/D_{10}$)	= —	

(Ref. : Clause 6.59(4) of General Specification for Civil Engineering Works (1992))

FINAL SUMMARY

CLAY	= 33	%
SILT	= 41	%
SAND	= 25	%
GRAVEL	= 1	%

Note : *Information provided by client
Remarks:HK0920636- 2

TESTED BY : W.N. CHAU	CHECKED BY : W.K. Chan	CERTIFIED BY : CHEUNG WING TAI
POST : Lab. Technician	POST : Reporting Officer	POST : Dept. Manager
DATE : 15/10/2009	DATE : 23/10/2009	DATE : 23/10/2009

REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION OF SOIL

IN ACCORDANCE WITH GEOSPEC 3 : 2001 TEST(S) 8.1 / 8.5 / 8.7

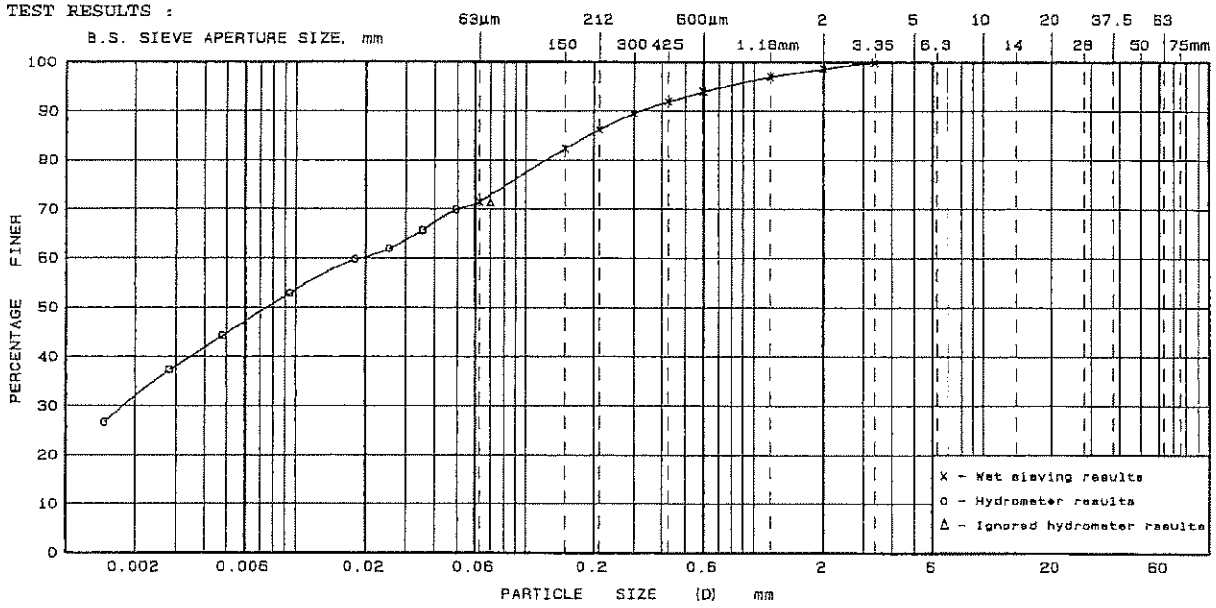
REPORT NO. : PSD09100054

CLIENT*	: ALS Technichem (HK) Pty Ltd		DATE RECEIVED : 05/10/2009
SITE*	: --		
TEST LOCATION	: GROUND FLOOR, 20 PAK KUNG STREET, HUNG HOM, KOWLOON		DATE STARTED : 09/10/2009
W.O. NO.*	: --	CONTRACT NO.* : --	DATE COMPLETED: 15/10/2009
JOB NO.	: GCE/09/092	TEST UNIT NO. : S 09065	SAMPLE TYPE* : BULK
HOLE NO.*	: --	SAMPLE NO.* : 3	SAMPLE DEPTH* : -- m
DESCRIPTION	: Wet light greenish slightly sandy SILT/CLAY		SPEC. DEPTH* : -- m

SAMPLE PREPARATION:

Procedure for sieving test : Method A

TEST RESULTS :



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COB-BLES
	SILT			SAND			GRAVEL			

The following information are only based on the opinion of the laboratory and are not under the scope of accreditation by HOKLAS :

ANALYSIS OF PARTICLE SIZE CURVE

Effective Diameter	(D_{10})	=	--- mm
Median Diameter	(D_{50})	=	0.0076 mm
Uniformity Coefficient	($U = D_{60}/D_{10}$)	=	---

(Ref. : Clause 6.59(4) of General Specification for Civil Engineering Works (1992))

FINAL SUMMARY

CLAY	=	32 %
SILT	=	39 %
SAND	=	28 %
GRAVEL	=	1 %

Note : *Information provided by client
Remarks:HK0920636~ 3

TESTED BY : W.N. CHAU	CHECKED BY : _____ W.K. Chan	CERTIFIED BY : _____ CHEUNG WING TAI
POST : Lab. Technician	POST : Reporting Officer	POST : Dept. Manager
DATE : 15/10/2009	DATE : 23/10/2009	DATE : 23/10/2009

REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION OF SOIL

IN ACCORDANCE WITH GEOSPEC 3 : 2001 TEST(S) 8.1 / 8.5 / 8.7

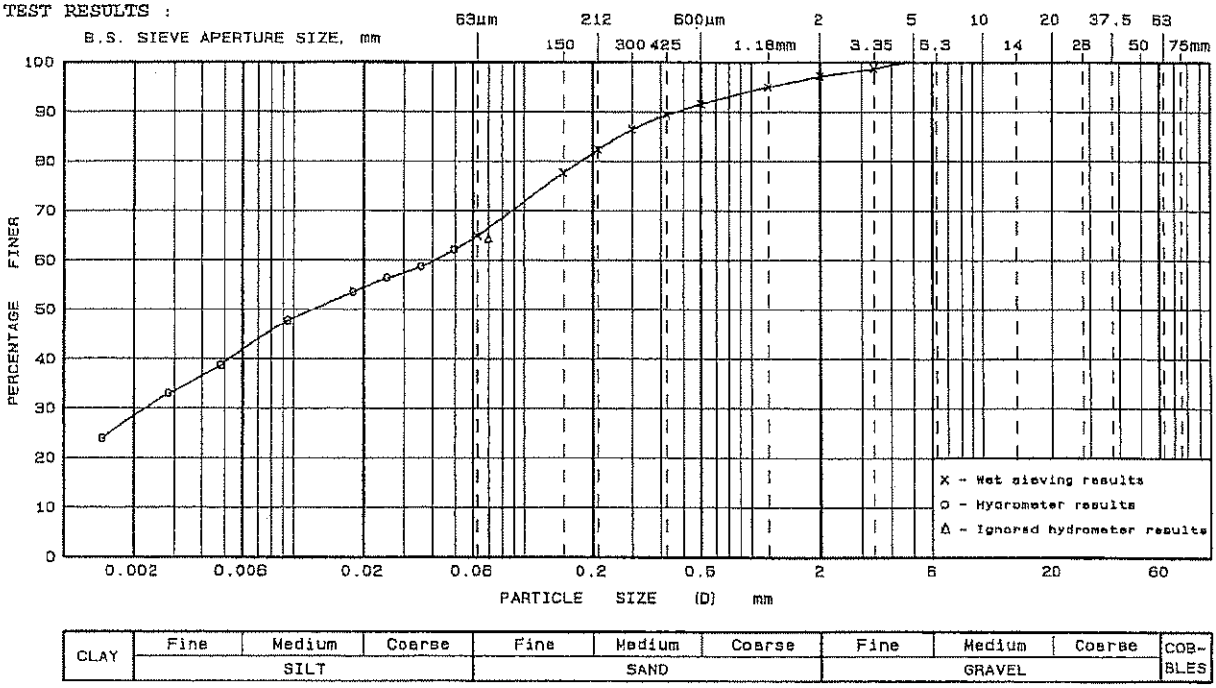
REPORT NO. : PSD09100055

CLIENT*	: ALS Technichem (HK) Pty Ltd	DATE RECEIVED	: 05/10/2009
SITE*	: --		
TEST LOCATION	: GROUND FLOOR, 20 PAK KUNG STREET, HUNG HOM, KOWLOON	DATE STARTED	: 09/10/2009
W.O. NO.*	: -- CONTRACT NO.* : --	DATE COMPLETED	: 15/10/2009
JOB NO.	: GCE/09/092 TEST UNIT NO. : S 09065	SAMPLE TYPE*	: BULK
HOLE NO.*	: -- SAMPLE NO.* : 4	SAMPLE DEPTH*	: -- m
DESCRIPTION	: Wet light greenish slightly sandy SILT/CLAY	SPEC. DEPTH*	: -- m

SAMPLE PREPARATION:

Procedure for sieving test : Method A

TEST RESULTS :



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COB-BLES
	SILT			SAND			GRAVEL			

The following information are only based on the opinion of the laboratory and are not under the scope of accreditation by HOKLAS :

ANALYSIS OF PARTICLE SIZE CURVE

Effective Diameter	(D_{10})	=	— mm
Median Diameter	(D_{50})	=	0.012 mm
Uniformity Coefficient	($U = D_{60}/D_{10}$)	=	—

(Ref. : Clause 6.59(4) of General Specification for Civil Engineering Works (1992))

FINAL SUMMARY

CLAY	=	29 %
SILT	=	36 %
SAND	=	32 %
GRAVEL	=	3 %

Note : *Information provided by client
Remarks:HK0920636- 4

TESTED BY : W.N. CHAU	CHECKED BY : W.K. Chan	CERTIFIED BY : CHEUNG WING TAI
POST : Lab. Technician	POST : Reporting Officer	POST : Dept. Manager
DATE : 15/10/2009	DATE : 23/10/2009	DATE : 23/10/2009

REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION OF SOIL

IN ACCORDANCE WITH GEOSPEC 3 : 2001 TEST(S) 8.1 / 8.5 / 8.7

REPORT NO. : PSD09100056

CLIENT* : ALS Technichem (HK) Pty Ltd
DATE RECEIVED : 05/10/2009

SITE* : --

TEST LOCATION : GROUND FLOOR, 20 PAK KUNG STREET, HUNG HOM, KOWLOON
DATE STARTED : 09/10/2009

W.O. NO.* : -- CONTRACT NO.* : --
DATE COMPLETED: 15/10/2009

JOB NO. : GCE/09/092 TEST UNIT NO. : S 09065
SAMPLE TYPE* : BULK

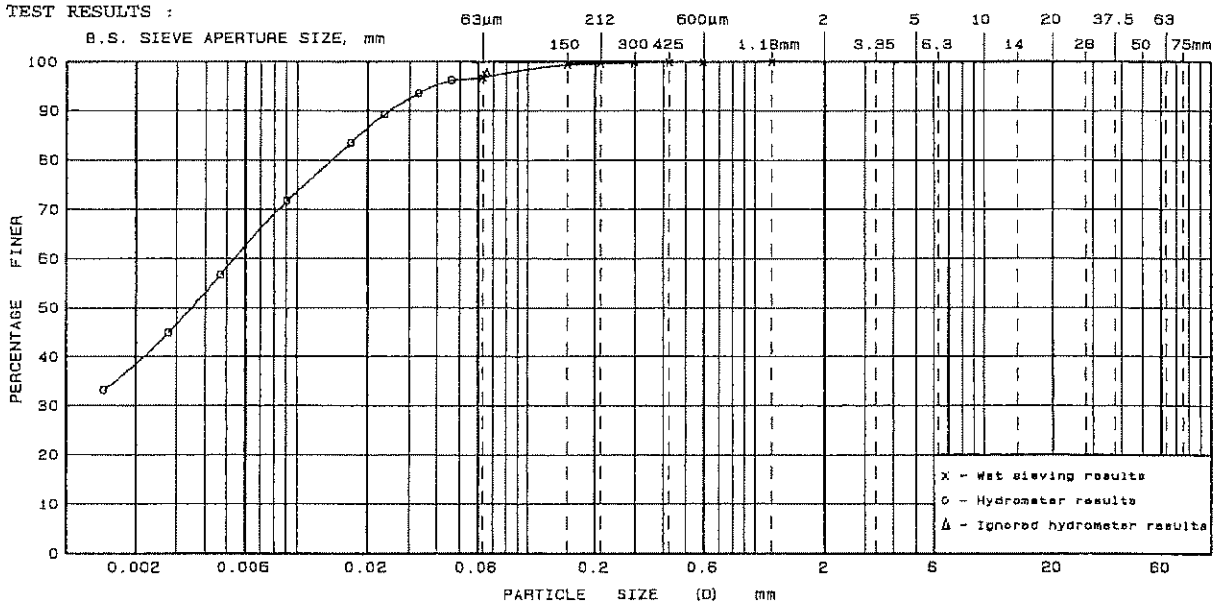
HOLE NO.* : -- SAMPLE NO.* : 5
SAMPLE DEPTH* : -- m

DESCRIPTION : Wet light greenish slightly sandy SILT/CLAY
SPEC. DEPTH* : -- m

SAMPLE PREPARATION:

Procedure for sieving test : Method A

TEST RESULTS :



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COB-BLES
	SILT			SAND			GRAVEL			

The following information are only based on the opinion of the laboratory and are not under the scope of accreditation by HOKLAS :

ANALYSIS OF PARTICLE SIZE CURVE

Effective Diameter	(D_{10})	=	— mm
Median Diameter	(D_{50})	=	0.0035 mm
Uniformity Coefficient	($U = D_{60}/D_{10}$)	=	—

(Ref. : Clause 6.59(4) of General Specification for Civil Engineering Works (1992))

FINAL SUMMARY

CLAY	=	39 %
SILT	=	58 %
SAND	=	3 %
GRAVEL	=	0 %

Note : *Information provided by client
Remarks:HK0920636- 5

TESTED BY : W.N. CHAU
POST : Lab. Technician
DATE : 15/10/2009

CHECKED BY : W.K. Chan
POST : Reporting Officer
DATE : 23/10/2009

CERTIFIED BY : CHEUNG WING TAI
POST : Dept. Manager
DATE : 23/10/2009

REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION OF SOIL

IN ACCORDANCE WITH GEOSPEC 3 : 2001 TEST(S) 8.1 / 8.5 / 8.7

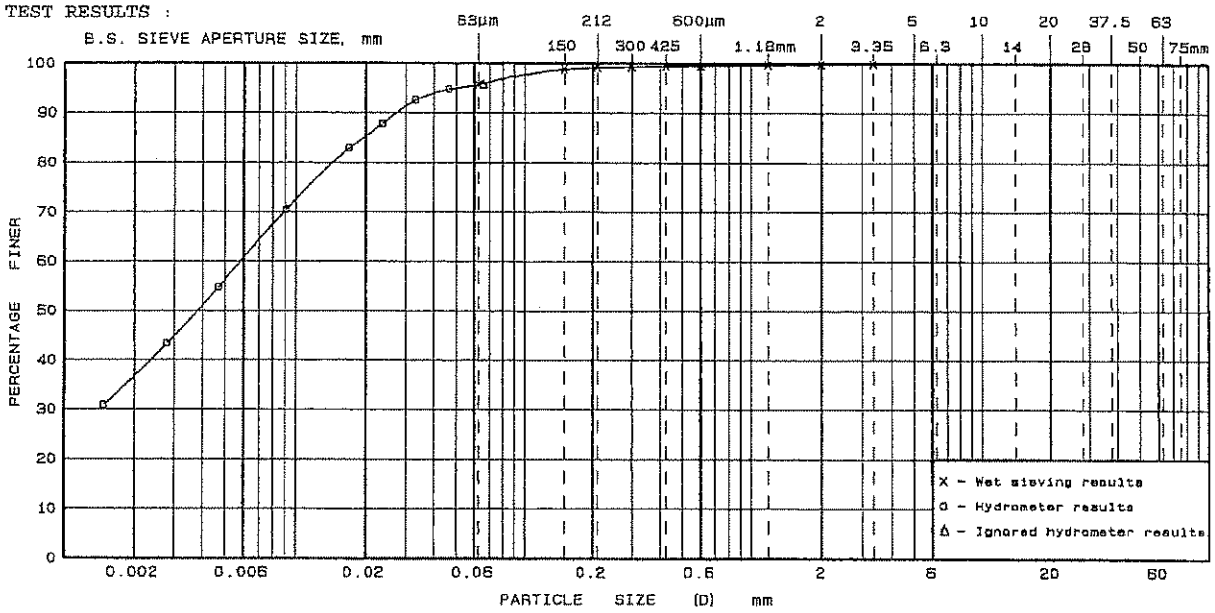
REPORT NO. : PSD09100057

CLIENT*	: ALS Technichem (HK) Pty Ltd	DATE RECEIVED	: 05/10/2009
SITE*	: --		
TEST LOCATION	: GROUND FLOOR, 20 PAK KUNG STREET, HUNG HOM, KOWLOON	DATE STARTED	: 09/10/2009
W.O. NO.*	: -- CONTRACT NO.* : --	DATE COMPLETED	: 15/10/2009
JOB NO.	: GCE/09/092 TEST UNIT NO. : S 09065	SAMPLE TYPE*	: BULK
HOLE NO.*	: -- SAMPLE NO.* : 6	SAMPLE DEPTH*	: -- m
DESCRIPTION	: Wet light greenish slightly sandy SILT/CLAY	SPEC. DEPTH*	: -- m

SAMPLE PREPARATION:

Procedure for sieving test : Method A

TEST RESULTS :



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COB-BLES
	SILT			SAND			GRAVEL			

The following information are only based on the opinion of the laboratory and are not under the scope of accreditation by HOKLAS :

ANALYSIS OF PARTICLE SIZE CURVE

Effective Diameter	(D_{10})	=	— mm
Median Diameter	(D_{50})	=	0.0039 mm
Uniformity Coefficient	($U = D_{60}/D_{10}$)	=	—

(Ref. : Clause 6.59(4) of General Specification for Civil Engineering Works (1992))

FINAL SUMMARY

CLAY	=	37 %
SILT	=	59 %
SAND	=	4 %
GRAVEL	=	0 %

Note : *Information provided by client
Remarks:HK0920636- 6

TESTED BY : W.N. CHAU	CHECKED BY : W.K. Chan	CERTIFIED BY : CHEUNG WING TAI
POST : Lab. Technician	POST : Reporting Officer	POST : Dept. Manager
DATE : 15/10/2009	DATE : 23/10/2009	DATE : 23/10/2009

REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION OF SOIL

IN ACCORDANCE WITH GEOSPEC 3 : 2001 TEST(S) 8.1 / 8.5 / 8.7

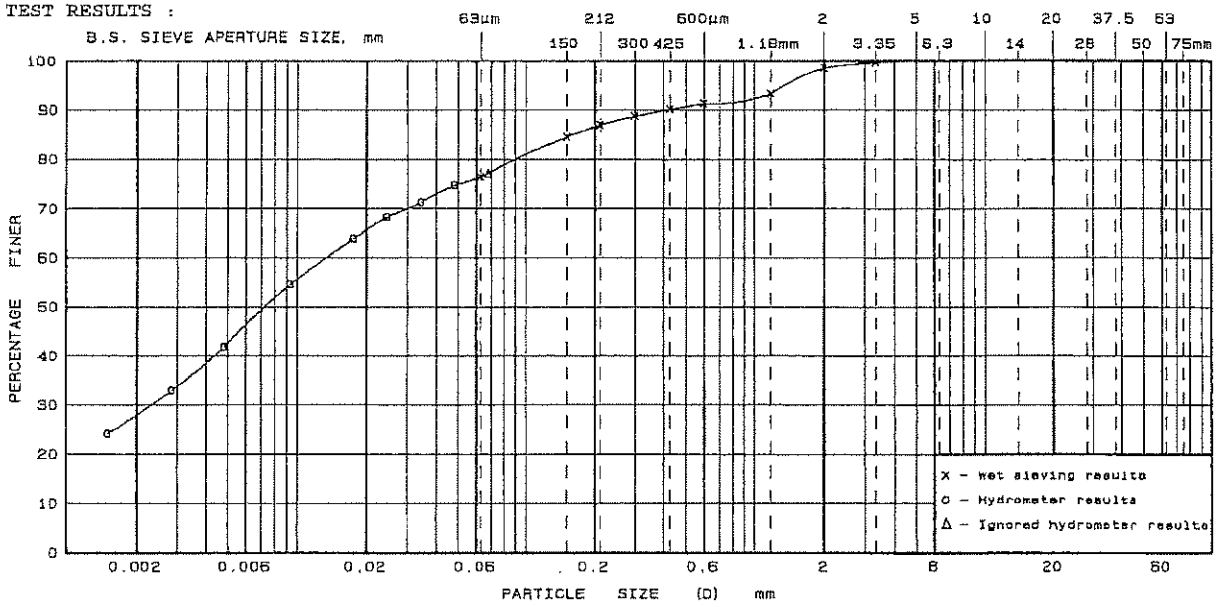
REPORT NO. : PSD09100058

CLIENT*	: ALS Technichem (HK) Pty Ltd	DATE RECEIVED	: 05/10/2009
SITE*	: --		
TEST LOCATION	: GROUND FLOOR, 20 PAK KUNG STREET, HUNG HOM, KOWLOON	DATE STARTED	: 09/10/2009
W.O. NO.*	: -- CONTRACT NO.* : --	DATE COMPLETED	: 15/10/2009
JOB NO.	: GCE/09/092 TEST UNIT NO. : S 09065	SAMPLE TYPE*	: BULK
HOLE NO.*	: -- SAMPLE NO.* : 7	SAMPLE DEPTH*	: -- m
DESCRIPTION	: Wet light greenish slightly sandy SILT/CLAY	SPEC. DEPTH*	: -- m

SAMPLE PREPARATION:

Procedure for sieving test : Method A

TEST RESULTS :



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COB-BLES
	SILT			SAND			GRAVEL			

The following information are only based on the opinion of the laboratory and are not under the scope of accreditation by HOKLAS :

ANALYSIS OF PARTICLE SIZE CURVE

Effective Diameter	(D_{10})	= ---	mm
Median Diameter	(D_{50})	= 0.0074	mm
Uniformity Coefficient	($U = D_{60}/D_{10}$)	= ---	

(Ref. : Clause 6.59(4) of General Specification for Civil Engineering Works (1992))

FINAL SUMMARY

CLAY	= 28	%
SILT	= 48	%
SAND	= 23	%
GRAVEL	= 1	%

Note : *Information provided by client
Remarks:HK0920636- 7

TESTED BY : W.N. CHAU	CHECKED BY : W.K. Chan	CERTIFIED BY : CHEUNG WING TAI
POST : Lab. Technician	POST : Reporting Officer	POST : Dept. Manager
DATE : 15/10/2009	DATE : 23/10/2009	DATE : 23/10/2009

REPORT ON DETERMINATION OF PARTICLE SIZE DISTRIBUTION OF SOIL

IN ACCORDANCE WITH GEOSPEC 3 : 2001 TEST(S) 8.1 / 8.5 / 8.7

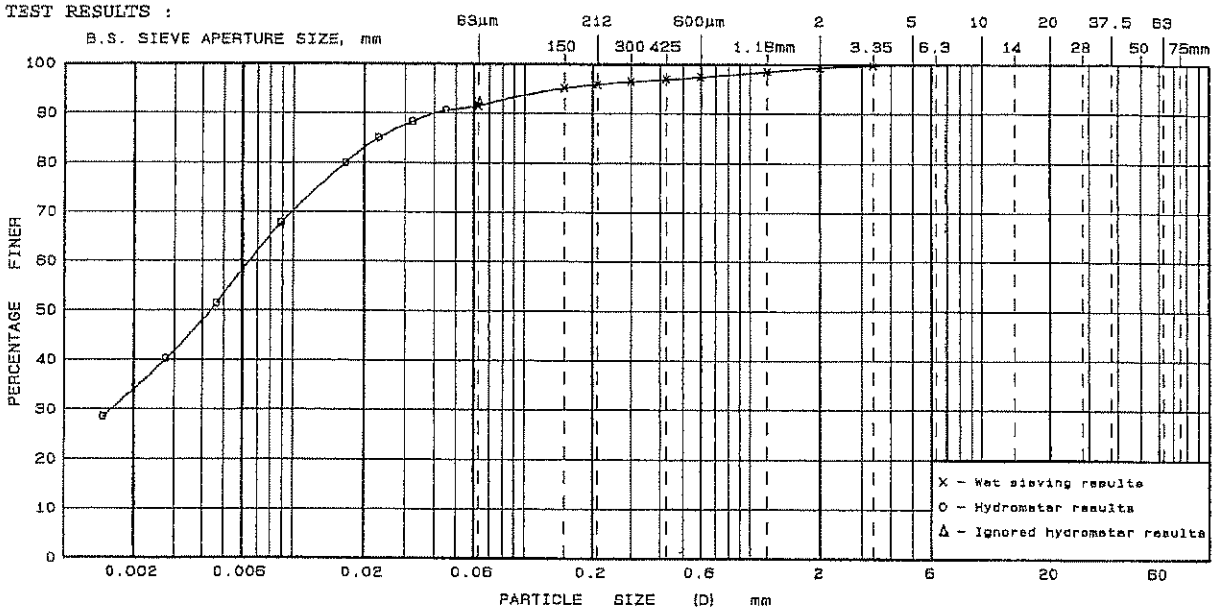
REPORT NO. : PSD09100059

CLIENT*	: ALS Technichem (HK) Pty Ltd			DATE RECEIVED	: 05/10/2009
SITE*	: --				
TEST LOCATION	: GROUND FLOOR, 20 PAK KUNG STREET, HUNG HOM, KOWLOON			DATE STARTED	: 09/10/2009
W.O. NO.*	: --	CONTRACT NO.*	: --	DATE COMPLETED	: 15/10/2009
JOB NO.	: GCE/09/092	TEST UNIT NO.	: S 09065	SAMPLE TYPE*	: BULK
HOLE NO.*	: --	SAMPLE NO.*	: 8	SAMPLE DEPTH*	: -- m
DESCRIPTION	: Wet light greenish slightly sandy SILT/CLAY			SPEC. DEPTH*	: -- m

SAMPLE PREPARATION:

Procedure for sieving test : Method A

TEST RESULTS :



CLAY	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	COB-BLES
	SILT			SAND			GRAVEL			

The following information are only based on the opinion of the laboratory and are not under the scope of accreditation by HOKLAS :

ANALYSIS OF PARTICLE SIZE CURVE

Effective Diameter	(D_{10})	= —	mm
Median Diameter	(D_{50})	= 0.0045	mm
Uniformity Coefficient	($U = D_{60}/D_{10}$)	= —	

(Ref. : Clause 6.59(4) of General Specification for Civil Engineering Works (1992))

FINAL SUMMARY

CLAY	= 34	%
SILT	= 57	%
SAND	= 8	%
GRAVEL	= 1	%

Note : *Information provided by client
Remarks:HK0920636- 8

TESTED BY : W.N. CHAU	CHECKED BY : W.K. Chan	CERTIFIED BY : CHEUNG WING TAI
POST : Lab. Technician	POST : Reporting Officer	POST : Dept. Manager
DATE : 15/10/2009	DATE : 23/10/2009	DATE : 23/10/2009

ANNEX G

BENTHIC DATA SUMMARY REPORT

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

ALS TECHNICHEM (HK) Pty Ltd
Environmental Division

CERTIFICATE OF ANALYSIS

CONTACT:	MR BEN TAM	**Batch:**	HK0920683
CLIENT:	ACTION UNITED ENVIRO SERVICES	LABORATORY:	HONG KONG
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35-41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	DATE RECEIVED:	28/09/2009
		DATE OF ISSUE:	07/12/2009
		SAMPLE TYPE:	BENTHIC
PROJECT:	TCS00295_05	No. of SAMPLES:	8
SITE:	SIU HO WAN		

COMMENTS

Sample(s) were picked up from client by ALS Technichem (HK) staff in a chilled condition.
Benthic Survey was subcontracted to Xiamen University.
Xiamen University details report was attached. The attached report contains a total of 6 pages.

Sample Details

ALS Lab ID	*Sample ID*	*Date of Sampling*
HK0920683 - 001	A (BENTHIC SAMPLE)	28/09/2009
HK0920683 - 002	B (BENTHIC SAMPLE)	28/09/2009
HK0920683 - 003	C (BENTHIC SAMPLE)	28/09/2009
HK0920683 - 004	D (BENTHIC SAMPLE)	28/09/2009
HK0920683 - 005	E (BENTHIC SAMPLE)	28/09/2009
HK0920683 - 006	F (BENTHIC SAMPLE)	28/09/2009
HK0920683 - 007	G (BENTHIC SAMPLE)	28/09/2009
HK0920683 - 008	H (BENTHIC SAMPLE)	28/09/2009

ISSUING LABORATORY: HONG KONG

Address

ALS Technichem (HK) Pty Ltd

11/F Chung Shun Knitting Centre
1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsenviro.com

Ms Wong Wai Man, Alice
Laboratory Manager - Hong Kong

Other ALS Environmental Laboratories

AUSTRALIA		*AMERICAS*
Brisbane	*Hong Kong*	*Vancouver*
Melbourne	*Singapore*	*Santiago*
Sydney	*Kuala Lumpur*	*Antofagasta*
Newcastle	*Bogor*	*Lima*

Abbreviations
% SPK REC denotes percentage spike recovery
CHK denotes duplicate check sample
LOR denotes limit of reporting
LCS % REC denotes Laboratory Control Sample percentage recovery

Benthic Data Summary Report

December 4, 2009

A total of 175 specimens were obtained from the 8 grabs at 8 stations. They belong to 4 animal phyla. Some juveniles and fragments were not identified to genus or family level. Eighteen families and twenty-two genera were identified: most of them belonging to Annelida.

Phylum	Number of identified families	Number of identified genera
Annelida	15	19
Arthropoda	1	1
Echinodermata	1	1
Nemertinea	1	1
Total	**18**	**22**

8 stations contained on average 21.9 specimens per station. The total biomass was 0.1937 g for all stations, with an average of 0.0242 g per station. The average individual wet weight was 1.1 mg/specimen.

Parameter	Overall	Per Grab
Number of specimens	175	21.9
Biomass (g)	0.1937	0.0242

A breakdown of the data by station (grab) reveals somewhat differences among station (grab) in terms of both number of specimens and biomass. The total number of specimens ranged from the lowest at station G (7 specimens) to the highest at station D (37 specimens). The average biomass value ranged from the lowest at station G (0.0070 g) to the highest at station A (0.0596 g). The average size of a specimen, as determined by individual wet weight, was also very low among stations, with the lowest of 0.5 mg at station F and the highest of 1.7 mg at station A.

Station	Number of grabs	Per Station (grab)		Weight per specimen (mg)
		No. of specimens	Biomass (g)	
A	1	36	0.0596	1.7
B	1	29	0.0322	1.1
C	1	16	0.0120	0.8
D	1	37	0.0430	1.2

Station	Number of grabs	Per Station (grab)		Weight per specimen (mg)
		No. of specimens	Biomass (g)	
E	1	18	0.0172	1.0
F	1	20	0.0105	0.5
G	1	7	0.0070	1.0
H	1	12	0.0122	1.0

One species was considered dominant, if a species with more than 10 individuals per station (grab). The "dominant" species and the corresponding stations were listed below. Some families in the datasheet contained more than 10 individuals, but these families contained more than one species, and each species had less than 10 individuals. Therefore, these stations were not listed in the following table.

Phylum	Class	Order	Family	Species	Station
Annelida	Polychaete	Spionida	Spionidae	*Prionospio cirrifera*	A, D, E

Reference:

Huang Z. G. (2008). Marine Species and Their Distributions in China's Seas. China Ocean Press Beijing.

Fauna Sinica. About 30 books. It includes polychaeta, mollusca, crustacea, echinodermata and so on Published from 1995 to 2001. (In Chinese)

The polychaete worms definitions and keys to the Orders, Families and Genera. 1977. By Kristian Fauchald.(In English)

Polychaete Annelida in Chinese Coast. By Yang Dejian and Sun Ruiping. 1987. (In Chinese)

Studies on Nereidae in Chinese Coast. By Wu Baoling and Sun Ruiping. 1981. (In Chinese)

Coloured Illustrations of Aquatic Mollusks in China. By Wang Rucai et al. 1988. (In Chinese)

Coloured Illustrations of Hong Kong animals. 1982. (In Chinese)

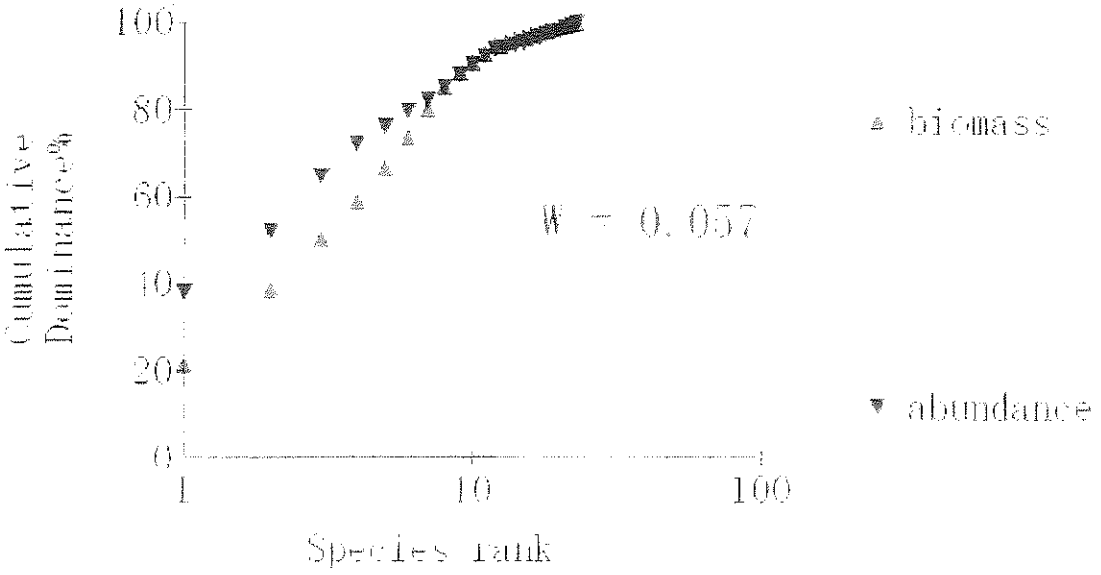
Chinese Marine Crabs. 1988. Dai Aiyun. (In Chinese)

The Marine Flora and Fauna of Hong Kong and Southern China. I to V. Ed. By Brian Morton 1990-2001

Cai Yingya. Mollusca in Guangdong. Shantou University Press. 2007. (In Chinese)

Diversity Index

Station	Number of species	Number of individuals	Species Richness	Pielou's Eveness	Diversity Index H' (log10)
A	11	36	2.791	0.818	0.852
B	16	29	4.455	0.929	1.119
C	4	16	1.082	0.712	0.429
D	11	37	2.769	0.779	0.811
E	7	18	2.076	0.634	0.536
F	5	20	1.335	0.769	0.537
G	4	7	1.542	0.921	0.555
H	10	12	3.622	0.960	0.960



Summary Data of Benthic Macrofauna

Seq	Station	Mass(g)	Number	Phylum	Class	Order	Family	Genus	Species
1	A	0.0357	2	Annelida	Polychaeta	Eunicida	Lumbrineridae	Lumbrineris	Lumbrineris sp.
2	A	0.0032	12	Annelida	Polychaeta	Spionida	Spionidae	Prionospio	Prionospio cirrifera
3	A	0.0008	1	Annelida	Polychaeta	Phyllodocida	Pilargidae	Ancistrosyllis	Ancistrosyllis pilargiformis
4	A	0.0025	4	Annelida	Polychaeta	Spionida	Cirratulidae	Tharyx	Tharyx sp.
5	A	0.0015	5	Annelida	Polychaeta	Phyllodocida	Pilargidae	Sigambra	Sigambra hanaokai
6	A	0.0023	1	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Aglaophamus	Aglaophamus dibranchis
7	A	0.0009	1	Annelida	Polychaeta	Phyllodocida	Chrysopetalidae	Bhawania	Bhawania goodei
8	A	0.0022	1	Annelida	Polychaeta	Phyllodocida	Hesionidae	Micropodarke	Micropodarke dubia
9	A	0.0040	7	Annelida	Polychaeta	Capitellida	Capitellidae	Mediomastus	Mediomastus californiensis
10	A	0.0064	1	Annelida	Polychaeta	Capitellida	Maldanidae	Euclymene	Euclymene sp.
11	A	0.0006	1	Echinodermata	Stelleroidea	Ophiurida	Amphiuridae	Amphioplus	Amphioplus sp.
12	B	0.0055	2	Annelida	Polychaeta	Phyllodocida	Hesionidae	Micropodarke	Micropodarke dubia
13	B	0.0005	1	Annelida	Polychaeta	Phyllodocida	Syllidae	Eusyllis	Eusyllis sp.
14	B	0.0015	5	Arthropoda	Crustacea	Amphipoda	Corophiidae	Corophium	Corophium sp.
15	B	0.0017	1	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Aglaophamus	Aglaophamus dibranchis
16	B	0.0032	2	Annelida	Polychaeta	Spionida	Spionidae	Polydora	Polydora sp.
17	B	0.0008	1	Annelida	Polychaeta	Spionida	Spionidae	Laonice	Laonice cirrata
18	B	0.0024	3	Annelida	Polychaeta	Phyllodocida	Pilargidae	Sigambra	Sigambra hanaokai
19	B	0.0007	1	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteone	Eteone sp.
20	B	0.0010	3	Annelida	Polychaeta	Capitellida	Capitellidae	Mediomastus	Mediomastus californiensis
21	B	0.0032	4	Annelida	Polychaeta	Spionida	Cirratulidae	Tharyx	Tharyx sp.
22	B	0.0012	1	Annelida	Polychaeta	Spionida	Spionidae	Prionospio	Prionospio queenslandica
23	B	0.0028	1	Annelida	Polychaeta	Eunicida	Lumbrineridae	Lumbrineris	Lumbrineris sp.
24	B	0.0010	1	Annelida	Polychaeta	Spionida	Magelonidae	Magelona	Magelona pacifica
25	B	0.0005	1	Annelida	Polychaeta	Spionida	Spionidae	Prionospio	Prionospio cirrifera
26	B	0.0006	1	Annelida	Polychaeta	Phyllodocida	Pilargidae	Ancistrosyllis	Ancistrosyllis pilargiformis
27	B	0.0056	1	Nemertinea	Anopla	Heteronemertea	Cerebratulidae	Cerebratulina	Cerebratulina sp.
28	C	0.0028	10	Annelida	Polychaeta	Spionida	Spionidae	Prionospio	Prionospio cirrifera
29	C	0.0010	1	Annelida	Polychaeta	Spionida	Cirratulidae	Tharyx	Tharyx sp.
30	C	0.0008	1	Annelida	Polychaeta	Phyllodocida	Pilargidae	Sigambra	Sigambra hanaokai

Summary Data of Benthic Macrofauna

Seq	Station	Mass(g)	Number	Phylum	Class	Order	Family	Genus	Species
31	C	0.0074	4	Annelida	Polychaeta	Capitellida	Capitellidae	Mediomastus	Mediomastus californiensis
32	D	0.0020	4	Annelida	Polychaeta	Phyllodocida	Pilargidae	Sigambra	Sigambra hanaokai
33	D	0.0018	15	Annelida	Polychaeta	Spionida	Spionidae	Prionospio	Prionospio cirrifera
34	D	0.0056	7	Annelida	Polychaeta	Capitellida	Capitellidae	Mediomastus	Mediomastus californiensis
35	D	0.0067	2	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Aglaophamus	Aglaophamus dibranchis
36	D	0.0012	1	Echinodermata	Stelleroidea	Ophiurida	Amphiuridae	Amphioplus	Amphioplus sp.
37	D	0.0007	1	Annelida	Polychaeta	Phyllodocida	Pilargidae	Ancistrosyllis	Ancistrosyllis pilargiformis
38	D	0.0034	3	Annelida	Polychaeta	Phyllodocida	Hesionidae	Micropodarke	Micropodarke dubia
39	D	0.0006	1	Annelida	Polychaeta	Spionida	Cirratulidae	Tharyx	Tharyx sp.
40	D	0.0010	1	Annelida	Polychaeta	Phyllodocida	Glyceridae	Glycera	Glycera onomichinensis
41	D	0.0032	1	Annelida	Polychaeta	Eunicida	Lumbrineridae	Lumbrineris	Lumbrineris sp.
42	D	0.0173	1	Nemertinea	Anopla	Heteronemertea	Cerebratulidae	Cerebratulina	Cerebratulina sp.
43	E	0.0025	1	Annelida	Polychaeta	Phyllodocida	Hesionidae	Micropodarke	Micropodarke dubia
44	E	0.0034	12	Annelida	Polychaeta	Spionida	Spionidae	Prionospio	Prionospio cirrifera
45	E	0.0018	1	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Aglaophamus	Aglaophamus dibranchis
46	E	0.0017	1	Annelida	Polychaeta	Capitellida	Capitellidae	Mediomastus	Mediomastus californiensis
47	E	0.0012	1	Annelida	Polychaeta	Phyllodocida	Pilargidae	Sigambra	Sigambra hanaokai
48	E	0.0015	1	Echinodermata	Stelleroidea	Ophiurida	Amphiuridae	Amphioplus	Amphioplus sp.
49	E	0.0051	1	Nemertinea	Anopla	Heteronemertea	Cerebratulidae	Cerebratulina	Cerebratulina sp.
50	F	0.0023	6	Annelida	Polychaeta	Phyllodocida	Pilargidae	Sigambra	Sigambra hanaokai
51	F	0.0017	2	Annelida	Polychaeta	Spionida	Cirratulidae	Tharyx	Tharyx sp.
52	F	0.0010	1	Annelida	Polychaeta	Phyllodocida	Pilargidae	Ancistrosyllis	Ancistrosyllis pilargiformis
53	F	0.0030	10	Annelida	Polychaeta	Spionida	Spionidae	Prionospio	Prionospio cirrifera
54	F	0.0025	1	Nemertinea	Anopla	Heteronemertea	Cerebratulidae	Cerebratulina	Cerebratulina sp.
55	G	0.0031	1	Annelida	Polychaeta	Phyllodocida	Nephtyidae	Aglaophamus	Aglaophamus dibranchis
56	G	0.0018	2	Annelida	Polychaeta	Capitellida	Capitellidae	Mediomastus	Mediomastus californiensis
57	G	0.0009	1	Annelida	Polychaeta	Phyllodocida	Pilargidae	Sigambra	Sigambra hanaokai
58	G	0.0012	3	Annelida	Polychaeta	Spionida	Spionidae	Prionospio	Prionospio cirrifera
59	H	0.0010	1	Annelida	Polychaeta	Spionida	Spionidae	Paraprionospio	Paraprionospio pinnata
60	H	0.0009	1	Annelida	Polychaeta	Spionida	Poecilochaetidae	Poecilochaetus	Poecilochaetus serpens

Summary Data of Benthic Macrofauna

Seq	Station	Mass(g)	Number	Phylum	Class	Order	Family	Genus	Species
61	H	0.0007	1	Annelida	Polychaeta	Spionida	Cirratulidae	Tharyx	Tharyx sp.
62	H	0.0008	3	Annelida	Polychaeta	Spionida	Spionidae	Prionospio	Prionospio cirrifera
63	H	0.0007	1	Annelida	Polychaeta	Orbiniida	Orbiniidae	Scoloplos	Scoloplos sp.
64	H	0.0013	1	Annelida	Polychaeta	Capitellida	Capitellidae	Mediomastus	Mediomastus californiensis
65	H	0.0015	1	Annelida	Polychaeta	Phyllodocida	Pilargidae	Sigambra	Sigambra hanaokai
66	H	0.0012	1	Annelida	Polychaeta	Phyllodocida	Pilargidae	Ancistrosyllis	Ancistrosyllis pilargiformis
67	H	0.0014	1	Annelida	Polychaeta	Spionida	Spionidae	Polydora	Polydora sp.
68	H	0.0027	1	Nemertinea	Anopla	Heteronemertea	Cerebratulidae	Cerebratulina	Cerebratulina sp.
	Total	**0.1937**	**175**						