ALS Environmental

CEDD Contract No. GE/2009/16

Chemical and Biological Testing (Service Contract)

Service Order No. GE/2009/16.24

Planning and Engineering Study on Development of Lak Ma Chau Loop – Investigation Request for Sediment Sampling and Testing at Old Shenzhen River

Laboratory Chemical Testing Report (Final Report)

Prepared for

Civil Engineering and Development Department

Prepared By

ALS Technichem (HK) Pty Ltd

November 2, 2011

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Planning and Engineering Study on Development of Lak Ma Chau Loop – Investigation
Request for Sediment Sampling and Testing at Old Shenzhen River

Laboratory Chemical Testing Report (Final Report)

CLIENT:

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Date: November 2, 2011

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Section 1

Summary Report

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Sediment Quality Report
Project: AGREEMENT NO CE53/2008(CE) PLANNING AND ENGINEERING STUDY ON DEVELOPMENT OF LOK MA CHAU LOOP – INVESTIGATION
REQUEST FOR SEDIMENT SAMPLING AND TESTING AT OLD SHENZHEN RIVER
Order No.: CONTRACT NO. GE/2009/16.24

Analyte Description			Silver	Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Mercury	Total Polychlorinated biphenyls	Low M.W. PAHs	High M.W. PAHs	Tributyl Tin	Classification
Unit (In dry Wt basis)			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	ug TBT/L	
Reporting Limits			0.1	1	0.2	1	1	1	1	1	0.05	18	550	1700	0.015	
Lower Chemical Exceedance Level (LCEL)			**1**	**12**	**1.5**	**80**	**65**	**40**	**75**	**200**	**0.5**	**23**	**550**	**1700**	**0.15**	
Upper Chemical Exceedance Level (UCEL)			***2***	***42***	***4***	***160***	***110***	***40***	***110***	***270***	***1***	***180***	***3160***	***9600***	***0.15***	
10 x (LCEL)			**10**	**120**	**15**	**800**	**650**	**400**	**750**	**2000**	**5**	**230**	**5500**	**17000**	**1.5**	
Sample Description																
ALS Lab ID	Sample ID	Sampling Date														
HK1120444001	GR5	31/08/2011	0.7	**15**	1.1	52	**80**	***43***	49	***551***	0.12	<18	<550	<1700	<0.015	***H***
HK1120444002	GR6	31/08/2011	0.8	**17**	1.2	56	**76**	***52***	53	***604***	0.11	<18	<550	<1700	<0.015	***H***
HK1120444003	GR7	31/08/2011	0.7	**17**	0.9	47	62	***43***	45	***455***	0.09	<18	<550	<1700	<0.015	***H***
HK1120444004	GR8	31/08/2011	0.7	**16**	1.0	51	61	***48***	50	***496***	0.29	<18	<550	<1700	<0.015	***H***
HK1120444005	GR9	31/08/2011	0.8	**17**	1.0	54	60	***50***	52	***498***	0.11	<18	<550	<1700	<0.015	***H***
HK1120444006	GR10	31/08/2011	0.9	**18**	1.2	55	64	***53***	52	***549***	0.10	<18	<550	<1700	<0.015	***H***
HK1120444007	GR11	31/08/2011	0.6	**15**	0.9	42	42	***41***	43	***410***	0.08	<18	<550	<1700	<0.015	***H***

Bold: Value that exceed LCEL
Bold Italic and Underlined: Value that exceed UCEL
Bold and Underlined: Value that exceed 10 x LCEL

Total PCB: Total PCBs calculated through summation of the 18 PCB congeners, based on raw data above the limit of detection of 1ug/kg.
For detailed information on the individual congeners please refer to the certificate of analysis for the work order.

IS Denoted: Insufficient interstitial water generated for TBT analysis.

Category L: **Analytical results less than or equal to Lower Chemical Exceedance Level (LCEL)**
Category M: **Analytical results greater than Lower Chemical Exceedance Level (LCEL), but less than or equal to Upper Chemical Exceedance Level (UCEL)**
Category H: **Analytical results greater than Upper Chemical Exceedance Level (UCEL)**
Category 10xLCEL: **Analytical results greater than 10x Lower Chemical Exceedance Level (10xLCEL)**

Summary Result for Elutriate Samples

Date of Issue: 19/10/2011
Client: Civil Engineering and Development Department
Service Order No.: GE/2009/16.24
Project: Agreement No. CE 53/2008(CE) Planning and Engineering Study on Development of Lok Ma Chau Loop- Investigation
Request for Sediment Sampling and Testing at Old Shenzhen River

ALS Lab ID		HK1120450001	HK1120450002	HK1120450003	HK1120450004	HK1120450005	HK1120450006	HK1120450007	HK1120450009
Client Sample ID		GR5	GR6	GR7	GR8	GR9	GR10	GR11	Blank Water Sample
Sampling Date	Unit	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011
Inorganic Nonmetallic Parameters									
Ammonia as N	mg/L	12.1	6.31	4.20	8.90	2.99	1.63	4.93	0.06
Reactive Phosphorus as P	µg/L	<5	<5	<5	<5	<5	<5	<5	<5
Total Kjeldahl Nitrogen as N	mg/L	14	6	4	10	3	2	10	<1
Total Phosphorus as P	mg/L	<0.02	<0.02	<0.02	0.05	0.06	<0.02	0.02	0.02
Nitrate as N	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite as N	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Metals									
Arsenic	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Copper	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Lead	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Mercury	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	µg/L	3	3	4	3	3	3	2	3
Silver	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	<10	<10	<10	<10	<10

Summary Result for Elutriate Samples

Date of Issue: 19/10/2011
Client: Civil Engineering and Development Department
Service Order No.: GE/2009/16.24
Project: Agreement No. CE 53/2008(CE) Planning and Engineering Study on Development of Lok Ma Chau Loop- Investigation Request for Sediment Sampling and Testing at Old Shenzhen River

ALS Lab ID	Unit	HK1120450001	HK1120450002	HK1120450003	HK1120450004	HK1120450005	HK1120450006	HK1120450007	HK1120450009
Client Sample ID		GR5	GR6	GR7	GR8	GR9	GR10	GR11	Blank Water Sample
Sampling Date		31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011
PCB Single Congeners									
PCB 8	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 18	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 28	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 52	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 44	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 66	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 101	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 77	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 118	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 153	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 105	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 126	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 187	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 128	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 180	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 169	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 170	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 138	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Organochlorine Pesticides (OC)									
Aldrin	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
alpha-BHC	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
beta-BHC	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
gamma-BHC	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
delta-BHC	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Heptachlor	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Heptachlor epoxide	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Endosulfan 1	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Endosulfan sulfate	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
4.4`-DDT	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
4.4`-DDD	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
4.4`-DDE	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Summary Result for Elutriate Samples

Date of Issue: 19/10/2011
Client: Civil Engineering and Development Department
Service Order No.: GE/2009/16.24
Project: Agreement No. CE 53/2008(CE) Planning and Engineering Study on Development of Lok Ma Chau Loop- Investigation Request for Sediment Sampling and Testing at Old Shenzhen River

ALS Lab ID	Unit	HK1120450001	HK1120450002	HK1120450003	HK1120450004	HK1120450005	HK1120450006	HK1120450007	HK1120450009
Client Sample ID		GR5	GR6	GR7	GR8	GR9	GR10	GR11	Blank Water Sample
Sampling Date		31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011	31/08/2011
Polycyclic Aromatics Hydrocarbons (PAHs)									
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Phenanthrene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Anthracene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Pyrene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benz(a)anthracene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b) & Benzo(k)fluoran	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzo(a)pyrene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1.2.3.cd)pyrene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a.h)anthracene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(g.h.i)perylene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Low M.W. PAHs	µg/L	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2	<2.2
High M.W. PAHs	µg/L	<6.8	<6.8	<6.8	<6.8	<6.8	<6.8	<6.8	<6.8
Triorganotins									
Tributyltin	µg TBT /L	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015

Section 2

Certificate of Analysis

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

HOKLAS 066

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 12
Contact	: IR POPHIL LAM	Contact	: Chan Kwok Fai, Godfrey	Work Order	: HK1120444
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, 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 2716 8609	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE53_2008 PLANNING AND ENGINEERING STUDY ON DEVELOPMENT OF LOK MA CHAU LOOP	Quote number	: ----	Date Samples Received	: 31-AUG-2011
Order number	: GE/2009/16.24			Issue Date	: 17-SEP-2011
C-O-C number	: H020498			No. of samples received	: 7
Site	: ----			No. of samples analysed	: 7

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Hong Kong Accreditation Service (HKAS) has accedited this laboratory (ALS Technichem (HK) Pty Ltd) under Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS Directory of Accredited Laboratories. The results shown in this certificate were determined by this laboratory in accordance with its terms of accreditation.

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*
Anh Ngoc Huynh	Senior Chemist - Organics	Organics
Chan Siu Ming, Vico	Manager - Inorganics	Inorganics
Tai Yuk Lun, Stephen	Senior Chemist - Organics	Organics
Wong Wing, Kenneth	Assistant Supervisor	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. The completion date of analysis is: 12-SEP-2011

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: **HK1120444**

Project Name: Agreement No. CE 53/2008. Planning and Engineering Study on Development of Lok Ma Chau Loop - Investigation Sediment Sampling and Testing at Old Shenzhen River.

Sample(s) were received in a chilled condition.

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

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 PCBs" results (Method: EP065) are not HOKLAS accredited. The values are calculated from summation of the 18 PCB congeners, based on Limit of Detection (LOD) of 1 ug/kg.

Analytical Results

Sub-Matrix: **SEDIMENT**

Compound	CAS Number	LOR	Unit	Client sample ID / Client sampling date / time	GR5 [31-AUG-2011] HK1120444-001	GR6 [31-AUG-2011] HK1120444-002	GR7 [31-AUG-2011] HK1120444-003	GR8 [31-AUG-2011] HK1120444-004	GR9 [31-AUG-2011] HK1120444-005
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103° C)	----	0.1	%		62.8	66.7	67.6	65.3	62.8
EG: Metals and Major Cations									
EG020: Arsenic	7440-38-2	1	mg/kg		15	17	17	16	17
EG020: Cadmium	7440-43-9	0.2	mg/kg		1.1	1.2	0.9	1.0	1.0
EG020: Chromium	7440-47-3	1	mg/kg		52	56	47	51	54
EG020: Copper	7440-50-8	1	mg/kg		80	76	62	61	60
EG020: Lead	7439-92-1	1	mg/kg		49	53	45	50	52
EG020: Mercury	7439-97-6	0.05	mg/kg		0.12	0.11	0.09	0.29	0.11
EG020: Nickel	7440-02-0	1	mg/kg		43	52	43	48	50
EG020: Silver	7440-22-4	0.1	mg/kg		0.7	0.8	0.7	0.7	0.8
EG020: Zinc	7440-66-6	1	mg/kg		551	604	455	496	498
EP-065: PCB Single Congeners									
PCB 8	34883-43-7	3	µg/kg		<3	<3	<3	<3	<3
PCB 18	37680-65-2	3	µg/kg		<3	<3	<3	<3	<3
PCB 28	7012-37-5	3	µg/kg		<3	<3	<3	<3	<3
PCB 44	41464-39-5	3	µg/kg		<3	<3	<3	<3	<3
PCB 52	35693-99-3	3	µg/kg		<3	<3	<3	<3	<3
PCB 66	32598-10-0	3	µg/kg		<3	<3	<3	<3	<3
PCB 77	32598-13-3	3	µg/kg		<3	<3	<3	<3	<3
PCB 101	37680-73-2	3	µg/kg		<3	<3	<3	<3	<3
PCB 105	32598-14-4	3	µg/kg		<3	<3	<3	<3	<3
PCB 118	31508-00-6	3	µg/kg		<3	<3	<3	<3	<3
PCB 126	57465-28-8	3	µg/kg		<3	<3	<3	<3	<3
PCB 128	38380-07-3	3	µg/kg		<3	<3	<3	<3	<3
PCB 138	35065-28-2	3	µg/kg		<3	<3	<3	<3	<3
PCB 153	35065-27-1	3	µg/kg		<3	<3	<3	<3	<3
PCB 169	32774-16-6	3	µg/kg		<3	<3	<3	<3	<3
PCB 170	35065-30-6	3	µg/kg		<3	<3	<3	<3	<3
PCB 180	35065-29-3	3	µg/kg		<3	<3	<3	<3	<3
PCB 187	52663-68-0	3	µg/kg		<3	<3	<3	<3	<3
Total Polychlorinated biphenyls	----	18	µg/kg		<18	<18	<18	<18	<18
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	50	µg/kg		<50	<50	<50	<50	<50
Acenaphthylene	208-96-8	50	µg/kg		<50	<50	<50	<50	<50
Acenaphthene	83-32-9	50	µg/kg		<50	<50	<50	<50	<50
Fluorene	86-73-7	50	µg/kg		<50	<50	<50	<50	<50
Phenanthrene	85-01-8	50	µg/kg		<50	<50	<50	<50	<50
Anthracene	120-12-7	50	µg/kg		<50	<50	<50	<50	<50
Fluoranthene	206-44-0	150	µg/kg		<150	<150	<150	<150	<150
Pyrene	129-00-0	150	µg/kg		<150	<150	<150	<150	<150
Benz(a)anthracene	56-55-3	150	µg/kg		<150	<150	<150	<150	<150

Sub-Matrix: SEDIMENT				Client sample ID	GR5	GR6	GR7	GR8	GR9
				Client sampling date / time	[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]
Compound	CAS Number	LOR	Unit		HK1120444-001	HK1120444-002	HK1120444-003	HK1120444-004	HK1120444-005
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued									
Chrysene	218-01-9	150	µg/kg		<150	<150	<150	<150	<150
Benzo(b)fluoranthene	205-99-2	150	µg/kg		<150	<150	<150	<150	<150
Benzo(k)fluoranthene	207-08-9	150	µg/kg		<150	<150	<150	<150	<150
Benzo(a)pyrene	50-32-8	150	µg/kg		<150	<150	<150	<150	<150
Indeno(1.2.3.cd)pyrene	193-39-5	150	µg/kg		<150	<150	<150	<150	<150
Dibenz(a.h)anthracene	53-70-3	150	µg/kg		<150	<150	<150	<150	<150
Benzo(g.h.i)perylene	191-24-2	150	µg/kg		<150	<150	<150	<150	<150
Low M.W. PAHs	----	550	µg/kg		<550	<550	<550	<550	<550
High M.W. PAHs	----	1700	µg/kg		<1700	<1700	<1700	<1700	<1700
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%		**68.5**	**99.7**	**127**	**68.0**	**73.0**
4-Terphenyl-d14	1718-51-0	0.1	%		**63.3**	**60.2**	**52.3**	**79.0**	**52.5**
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								Surrogate control limits listed at end of this report.	
Decachlorobiphenyl	2051-24-3	0.1	%		**50.6**	**54.2**	**55.3**	**52.3**	**51.2**

Sub-Matrix: SEDIMENT				Client sample ID	GR10	GR11			
				Client sampling date / time	[31-AUG-2011]	[31-AUG-2011]			
Compound	CAS Number	LOR	Unit		HK1120444-006	HK1120444-007			
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103° C)	----	0.1	%		59.2	54.6			
EG: Metals and Major Cations									
EG020: Arsenic	7440-38-2	1	mg/kg		18	15			
EG020: Cadmium	7440-43-9	0.2	mg/kg		1.2	0.9			
EG020: Chromium	7440-47-3	1	mg/kg		55	42			
EG020: Copper	7440-50-8	1	mg/kg		64	42			
EG020: Lead	7439-92-1	1	mg/kg		52	43			
EG020: Mercury	7439-97-6	0.05	mg/kg		0.10	0.08			
EG020: Nickel	7440-02-0	1	mg/kg		53	41			
EG020: Silver	7440-22-4	0.1	mg/kg		0.9	0.6			
EG020: Zinc	7440-66-6	1	mg/kg		549	410			
EP-065: PCB Single Congeners									
PCB 8	34883-43-7	3	µg/kg		<3	<3			
PCB 18	37680-65-2	3	µg/kg		<3	<3			
PCB 28	7012-37-5	3	µg/kg		<3	<3			
PCB 44	41464-39-5	3	µg/kg		<3	<3			
PCB 52	35693-99-3	3	µg/kg		<3	<3			
PCB 66	32598-10-0	3	µg/kg		<3	<3			
PCB 77	32598-13-3	3	µg/kg		<3	<3			
PCB 101	37680-73-2	3	µg/kg		<3	<3			
PCB 105	32598-14-4	3	µg/kg		<3	<3			
PCB 118	31508-00-6	3	µg/kg		<3	<3			
PCB 126	57465-28-8	3	µg/kg		<3	<3			
PCB 128	38380-07-3	3	µg/kg		<3	<3			
PCB 138	35065-28-2	3	µg/kg		<3	<3			
PCB 153	35065-27-1	3	µg/kg		<3	<3			
PCB 169	32774-16-6	3	µg/kg		<3	<3			
PCB 170	35065-30-6	3	µg/kg		<3	<3			
PCB 180	35065-29-3	3	µg/kg		<3	<3			
PCB 187	52663-68-0	3	µg/kg		<3	<3			
Total Polychlorinated biphenyls	----	18	µg/kg		<18	<18			
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	50	µg/kg		<50	<50			
Acenaphthylene	208-96-8	50	µg/kg		<50	<50			
Acenaphthene	83-32-9	50	µg/kg		<50	<50			
Fluorene	86-73-7	50	µg/kg		<50	<50			
Phenanthrene	85-01-8	50	µg/kg		<50	<50			
Anthracene	120-12-7	50	µg/kg		<50	<50			
Fluoranthene	206-44-0	150	µg/kg		<150	<150			
Pyrene	129-00-0	150	µg/kg		<150	<150			
Benz(a)anthracene	56-55-3	150	µg/kg		<150	<150			
Chrysene	218-01-9	150	µg/kg		<150	<150			

Sub-Matrix: **SEDIMENT**

Compound	CAS Number	LOR	Unit	Client sample ID: GR10 Client sampling date / time: [31-AUG-2011] HK1120444-006	Client sample ID: GR11 Client sampling date / time: [31-AUG-2011] HK1120444-007			
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150			
Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150			
Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150			
Indeno(1.2.3.cd)pyrene	193-39-5	150	µg/kg	<150	<150			
Dibenz(a.h)anthracene	53-70-3	150	µg/kg	<150	<150			
Benzo(g.h.i)perylene	191-24-2	150	µg/kg	<150	<150			
Low M.W. PAHs	----	550	µg/kg	<550	<550			
High M.W. PAHs	----	1700	µg/kg	<1700	<1700			
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	321-60-8	0.1	%	**59.4**	**103**			
4-Terphenyl-d14	1718-51-0	0.1	%	**59.9**	**72.2**			
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate							Surrogate control limits listed at end of this report.	
Decachlorobiphenyl	2051-24-3	0.1	%	**51.6**	**50.9**			

Sub-Matrix: INTERSTITIAL WATER				Client sample ID	GR5	GR6	GR7	GR8	GR9
				Client sampling date / time	[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]
Compound	CAS Number	LOR	Unit		HK1120444-001	HK1120444-002	HK1120444-003	HK1120444-004	HK1120444-005
EP-390: Triorganotins									
Tributyltin	56573-85-4	0.015	µg TBT /L		<0.015	<0.015	<0.015	<0.015	<0.015

Sub-Matrix: INTERSTITIAL WATER				Client sample ID	GR10	GR11			
				Client sampling date / time	[31-AUG-2011]	[31-AUG-2011]			
Compound	CAS Number	LOR	Unit		HK1120444-006	HK1120444-007			
EP-390: Triorganotins									
Tributyltin	56573-85-4	0.015	µg TBT /L		<0.015	<0.015			

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: 1940564)								
HK1120157-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	14.1	14.0	1.0
HK1120444-002	GR6	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	66.7	66.4	0.5
EG: Metals and Major Cations (QC Lot: 1941620)								
HK1120444-002	GR6	EG020: Mercury	7439-97-6	0.05	mg/kg	0.11	0.13	17.7
		EG020: Silver	7440-22-4	0.1	mg/kg	0.8	0.8	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	1.2	1.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	17	18	7.5
		EG020: Chromium	7440-47-3	1	mg/kg	56	59	6.0
		EG020: Copper	7440-50-8	1	mg/kg	76	81	6.5
		EG020: Lead	7439-92-1	1	mg/kg	53	56	4.7
		EG020: Nickel	7440-02-0	1	mg/kg	52	54	3.3
		EG020: Zinc	7440-66-6	1	mg/kg	604	616	2.0
EP-065: PCB Single Congeners (QC Lot: 1939715)								
HK1120444-001	GR5	Total Polychlorinated biphenyls	----	18	µg/kg	<18	<18	0.0
		PCB 8	34883-43-7	3	µg/kg	<3	<3	0.0
		PCB 18	37680-65-2	3	µg/kg	<3	<3	0.0
		PCB 28	7012-37-5	3	µg/kg	<3	<3	0.0
		PCB 44	41464-39-5	3	µg/kg	<3	<3	0.0
		PCB 52	35693-99-3	3	µg/kg	<3	<3	0.0
		PCB 66	32598-10-0	3	µg/kg	<3	<3	0.0
		PCB 77	32598-13-3	3	µg/kg	<3	<3	0.0
		PCB 101	37680-73-2	3	µg/kg	<3	<3	0.0
		PCB 105	32598-14-4	3	µg/kg	<3	<3	0.0
		PCB 118	31508-00-6	3	µg/kg	<3	<3	0.0
		PCB 126	57465-28-8	3	µg/kg	<3	<3	0.0
		PCB 128	38380-07-3	3	µg/kg	<3	<3	0.0
		PCB 138	35065-28-2	3	µg/kg	<3	<3	0.0
		PCB 153	35065-27-1	3	µg/kg	<3	<3	0.0
		PCB 169	32774-16-6	3	µg/kg	<3	<3	0.0
		PCB 170	35065-30-6	3	µg/kg	<3	<3	0.0
		PCB 180	35065-29-3	3	µg/kg	<3	<3	0.0
		PCB 187	52663-68-0	3	µg/kg	<3	<3	0.0
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1939716)								
HK1120444-001	GR5	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

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1939716) - Continued								
HK1120444-001	GR5	Benzo(g.h.i)perylene	191-24-2	150	µg/kg	<150	<150	0.0
		High M.W. PAHs	----	1700	µg/kg	<1700	<1700	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
		Low M.W. PAHs	----	550	µg/kg	<550	<550	0.0

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-390: Triorganotins (QC Lot: 1950262)								
HK1120444-001	GR5	Tributyltin	56573-85-4	6	ngSn/L	<6	<6	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 LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report Spike Concentration	Spike Recovery (%) LCS	DCS	Recovery Limits (%) Low	High	RPD (%) Value	Control Limit
EG: Metals and Major Cations (QC Lot: 1941620)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	89.4	----	85	115	----	----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	94.3	----	85	115	----	----
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	111	----	85	115	----	----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	98.6	----	85	115	----	----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	88.5	----	85	115	----	----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	97.6	----	85	115	----	----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	99.5	----	85	115	----	----
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	89.7	----	85	115	----	----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	99.5	----	85	115	----	----
EP-065: PCB Single Congeners (QC Lot: 1939715)											
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	61.4	----	39	117	----	----
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	62.5	----	44	120	----	----
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	70.4	----	54	121	----	----
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	70.6	----	43	128	----	----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	71.6	----	44	128	----	----
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	73.7	----	34	137	----	----
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	68.5	----	47	122	----	----
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	66.0	----	43	124	----	----
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	68.3	----	50	119	----	----
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	68.0	----	49	119	----	----
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	66.8	----	45	131	----	----
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	70.8	----	50	116	----	----
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	67.0	----	49	116	----	----
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	69.2	----	47	120	----	----

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-065: PCB Single Congeners (QC Lot: 1939715) - Continued											
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	73.7	----	55	117	----	----
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	74.7	----	50	117	----	----
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	73.6	----	49	116	----	----
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	69.8	----	45	122	----	----
Total Polychlorinated biphenyls	----	18	µg/kg	<18	----	----	----	----	----	----	----
EP-076A: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 1939716)											
Naphthalene	91-20-3	50	µg/kg	<50	250 µg/kg	98.7	----	48	142	----	----
Acenaphthylene	208-96-8	50	µg/kg	<50	250 µg/kg	115	----	48	120	----	----
Acenaphthene	83-32-9	50	µg/kg	<50	250 µg/kg	94.0	----	47	138	----	----
Fluorene	86-73-7	50	µg/kg	<50	250 µg/kg	125	----	53	134	----	----
Phenanthrene	85-01-8	50	µg/kg	<50	250 µg/kg	110	----	50	139	----	----
Anthracene	120-12-7	50	µg/kg	<50	250 µg/kg	96.4	----	50	136	----	----
Fluoranthene	206-44-0	50	µg/kg	<50	250 µg/kg	89.4	----	58	133	----	----
Pyrene	129-00-0	50	µg/kg	<50	250 µg/kg	103	----	56	131	----	----
Benz(a)anthracene	56-55-3	50	µg/kg	<50	250 µg/kg	102	----	56	121	----	----
Chrysene	218-01-9	50	µg/kg	<50	250 µg/kg	109	----	74	124	----	----
Benzo(b)fluoranthene	205-99-2	50	µg/kg	<50	250 µg/kg	55.4	----	53	119	----	----
Benzo(k)fluoranthene	207-08-9	50	µg/kg	<50	250 µg/kg	80.8	----	66	132	----	----
Benzo(a)pyrene	50-32-8	50	µg/kg	<50	250 µg/kg	73.0	----	45	105	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	50	µg/kg	<50	250 µg/kg	94.0	----	53	139	----	----
Dibenz(a.h)anthracene	53-70-3	50	µg/kg	<50	250 µg/kg	88.0	----	47	122	----	----
Benzo(g.h.i)perylene	191-24-2	50	µg/kg	<50	250 µg/kg	103	----	49	127	----	----
Low M.W. PAHs	----	550	µg/kg	<550	----	----	----	----	----	----	----
High M.W. PAHs	----	1700	µg/kg	<1700	----	----	----	----	----	----	----

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-390: Triorganotins (QC Lot: 1950262)											
Tributyltin	56573-85-4	5	ngSn/L	<5	5 ngSn/L	104	----	70	130	----	----

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: 1941620)										
HK1120444-001	GR5	EG020: Arsenic	7440-38-2	5 mg/kg	79.4	----	75	125	----	----
		EG020: Cadmium	7440-43-9	5 mg/kg	84.2	----	75	125	----	----
		EG020: Chromium	7440-47-3	5 mg/kg	88.1	----	75	125	----	----
		EG020: Copper	7440-50-8	5 mg/kg	# Not Determined	----	75	125	----	----
		EG020: Lead	7439-92-1	5 mg/kg	86.3	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.1 mg/kg	88.6	----	75	125	----	----
		EG020: Nickel	7440-02-0	5 mg/kg	83.2	----	75	125	----	----
		EG020: Silver	7440-22-4	5 mg/kg	86.7	----	75	125	----	----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: SEDIMENT

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-065S: PCB Congeners and Organochlorine Pesticides Surrogate			
Decachlorobiphenyl	2051-24-3	50	130

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 11
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Project	: AGREEMENT NO CE53_2008 PLANNING AND ENGINEERING STUDY ON DEVELOPMENT OF LOK MA CHAU LOOP	Quote number	: ----	Date Samples Received	: 31-AUG-2011
Order number	: GE/2009/16.24			Issue Date	: 17-SEP-2011
C-O-C number	: H020499			No. of samples received	: 9
Site	: ----			No. of samples analysed	: 8

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Signatories	*Position*	*Authorised results for*
Anh Ngoc Huynh	Senior Chemist	Organics
PP 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 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. The completion date of analysis is: 15-SEP-2011

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: **HK1120450**

Project Name: Agreement No. CE 53/2008. Planning and Engineering Study on Development of Lok Ma Chau Loop - Investigation. Sediment Sampling and Testing at Old Shenzhen River.

Sample(s) were received in a chilled condition.

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

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

Analytical Results

Sub-Matrix: **ELUTRIATE**

Compound	CAS Number	LOR	Unit	Client sample ID	GR5	GR6	GR7	GR8	GR9
				Client sampling date / time	[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]
					HK1120450-001	HK1120450-002	HK1120450-003	HK1120450-004	HK1120450-005
ED/EK: Inorganic Nonmetallic Parameters									
EK055K: Ammonia as N	7664-41-7	0.01	mg/L		12.1	6.31	4.20	8.90	2.99
EK057A: Nitrite as N	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK058A: Nitrate as N	14797-55-8	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/L		14	6	4	10	3
EK067A: Total Phosphorus as P	----	0.02	mg/L		<0.02	<0.02	<0.02	0.05	0.06
EK071K: Reactive Phosphorus as P	----	5	µg/L		<5	<5	<5	<5	<5
EG: Metals and Major Cations - Filtered									
EG020: Arsenic	7440-38-2	10	µg/L		<10	<10	<10	<10	<10
EG020: Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
EG020: Chromium	7440-47-3	1	µg/L		<1	<1	<1	<1	<1
EG020: Copper	7440-50-8	1	µg/L		<1	<1	<1	<1	<1
EG020: Lead	7439-92-1	1	µg/L		<1	<1	<1	<1	<1
EG020: Mercury	7439-97-6	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
EG020: Nickel	7440-02-0	1	µg/L		3	3	4	3	3
EG020: Silver	7440-22-4	1	µg/L		<1	<1	<1	<1	<1
EG020: Zinc	7440-66-6	10	µg/L		<10	<10	<10	<10	<10
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs)									
Naphthalene	91-20-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	208-96-8	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthene	83-32-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	86-73-7	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Phenanthrene	85-01-8	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Anthracene	120-12-7	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Fluoranthene	206-44-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Pyrene	129-00-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Benz(a)anthracene	56-55-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	218-01-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b) & Benzo(k)fluoranthene	205-99-2 207-08-9	0.4	µg/L		<0.4	<0.4	<0.4	<0.4	<0.4
Benzo(a)pyrene	50-32-8	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Low M.W. PAHs	----	2.2	µg/L		<2.2	<2.2	<2.2	<2.2	<2.2
High M.W. PAHs	----	6.8	µg/L		<6.8	<6.8	<6.8	<6.8	<6.8
EP-065A: PCB Single Congeners									
PCB 8	34883-43-7	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 18	37680-65-2	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 28	7012-37-5	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 52	35693-99-3	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 44	41464-39-5	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 66	32598-10-0	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01

Sub-Matrix: **ELUTRIATE**

Compound	CAS Number	LOR	Unit	Client sample ID / Client sampling date / time	GR5 [31-AUG-2011] HK1120450-001	GR6 [31-AUG-2011] HK1120450-002	GR7 [31-AUG-2011] HK1120450-003	GR8 [31-AUG-2011] HK1120450-004	GR9 [31-AUG-2011] HK1120450-005
EP-065A: PCB Single Congeners - Continued									
PCB 101	37680-73-2	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 77	32598-13-3	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 118	31508-00-6	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 153	35065-27-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 105	32598-14-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 126	57465-28-8	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 187	52663-68-0	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 128	38380-07-3	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 180	35065-29-3	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 169	32774-16-6	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 170	35065-30-6	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PCB 138	35065-28-2	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP-067A: Organochlorine Pesticides (OC)									
Aldrin	309-00-2	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
alpha-BHC	319-84-6	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
beta-BHC	319-85-7	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
gamma-BHC	58-89-9	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
delta-BHC	319-86-8	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Heptachlor	76-44-8	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Heptachlor epoxide	1024-57-3	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Endosulfan 1	959-98-8	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Endosulfan sulfate	1031-07-8	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
4.4`-DDT	50-29-3	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
4.4`-DDD	72-54-8	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
4.4`-DDE	72-55-9	0.10	µg/L		<0.10	<0.10	<0.10	<0.10	<0.10
EP-390: Triorganotins									
Tributyltin	56573-85-4	0.015	µg TBT /L		<0.015	<0.015	<0.015	<0.015	<0.015
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								Surrogate control limits listed at end of this report.	
Nitrobenzene -d5	4165-60-0	0.1	%		**57.8**	**86.4**	**60.7**	**58.5**	**52.7**
4-Terphenyl-d14	1718-51-0	0.1	%		**88.4**	**101**	**102**	**109**	**115**
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								Surrogate control limits listed at end of this report.	
Decachlorobiphenyl	2051-24-3	0.1	%		**70.8**	**85.2**	**78.2**	**79.6**	**85.8**
EP-067S: Pesticide Surrogate								Surrogate control limits listed at end of this report.	
Dibutylchlorendate	1770-80-5	0.1	%		**66.6**	**61.8**	**67.4**	**61.3**	**108**

Sub-Matrix: ELUTRIATE

Compound	CAS Number	LOR	Unit	Client sample ID: GR10	GR11	BLANK WATER SAMPLE		
				Client sampling date / time: [31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]		
				HK1120450-006	HK1120450-007	HK1120450-009		
ED/EK: Inorganic Nonmetallic Parameters								
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	**1.63**	**4.93**	**0.06**		
EK057A: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01		
EK058A: Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01		
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/L	**2**	**10**	<1		
EK067A: Total Phosphorus as P	----	0.02	mg/L	<0.02	**0.02**	**0.02**		
EK071K: Reactive Phosphorus as P	----	5	µg/L	<5	<5	<5		
EG: Metals and Major Cations - Filtered								
EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	<10		
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	<0.2		
EG020: Chromium	7440-47-3	1	µg/L	<1	<1	<1		
EG020: Copper	7440-50-8	1	µg/L	<1	<1	<1		
EG020: Lead	7439-92-1	1	µg/L	<1	<1	<1		
EG020: Mercury	7439-97-6	0.1	µg/L	<0.1	<0.1	<0.1		
EG020: Nickel	7440-02-0	1	µg/L	**3**	**2**	**3**		
EG020: Silver	7440-22-4	1	µg/L	<1	<1	<1		
EG020: Zinc	7440-66-6	10	µg/L	<10	<10	<10		
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.2	µg/L	<0.2	<0.2	<0.2		
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	<0.2	<0.2		
Acenaphthene	83-32-9	0.2	µg/L	<0.2	<0.2	<0.2		
Fluorene	86-73-7	0.2	µg/L	<0.2	<0.2	<0.2		
Phenanthrene	85-01-8	0.2	µg/L	<0.2	<0.2	<0.2		
Anthracene	120-12-7	0.2	µg/L	<0.2	<0.2	<0.2		
Fluoranthene	206-44-0	0.2	µg/L	<0.2	<0.2	<0.2		
Pyrene	129-00-0	0.2	µg/L	<0.2	<0.2	<0.2		
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	<0.2	<0.2		
Chrysene	218-01-9	0.2	µg/L	<0.2	<0.2	<0.2		
Benzo(b) & Benzo(k)fluoranthene	205-99-2 207-08-9	0.4	µg/L	<0.4	<0.4	<0.4		
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	<0.2	<0.2		
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	<0.2	<0.2		
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	<0.2	<0.2		
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	<0.2	<0.2		
Low M.W. PAHs	----	2.2	µg/L	<2.2	<2.2	<2.2		
High M.W. PAHs	----	6.8	µg/L	<6.8	<6.8	<6.8		
EP-065A: PCB Single Congeners								
PCB 8	34883-43-7	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 18	37680-65-2	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 28	7012-37-5	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 52	35693-99-3	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 44	41464-39-5	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 66	32598-10-0	0.01	µg/L	<0.01	<0.01	<0.01		

Sub-Matrix: **ELUTRIATE**

Compound	CAS Number	LOR	Unit	GR10	GR11	BLANK WATER SAMPLE		
Client sample ID								
Client sampling date / time				[31-AUG-2011]	[31-AUG-2011]	[31-AUG-2011]		
				HK1120450-006	HK1120450-007	HK1120450-009		
EP-065A: PCB Single Congeners - Continued								
PCB 101	37680-73-2	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 77	32598-13-3	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 118	31508-00-6	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 153	35065-27-1	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 105	32598-14-4	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 126	57465-28-8	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 187	52663-68-0	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 128	38380-07-3	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 180	35065-29-3	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 169	32774-16-6	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 170	35065-30-6	0.01	µg/L	<0.01	<0.01	<0.01		
PCB 138	35065-28-2	0.01	µg/L	<0.01	<0.01	<0.01		
EP-067A: Organochlorine Pesticides (OC)								
Aldrin	309-00-2	0.10	µg/L	<0.10	<0.10	<0.10		
alpha-BHC	319-84-6	0.10	µg/L	<0.10	<0.10	<0.10		
beta-BHC	319-85-7	0.10	µg/L	<0.10	<0.10	<0.10		
gamma-BHC	58-89-9	0.10	µg/L	<0.10	<0.10	<0.10		
delta-BHC	319-86-8	0.10	µg/L	<0.10	<0.10	<0.10		
Heptachlor	76-44-8	0.10	µg/L	<0.10	<0.10	<0.10		
Heptachlor epoxide	1024-57-3	0.10	µg/L	<0.10	<0.10	<0.10		
Endosulfan 1	959-98-8	0.10	µg/L	<0.10	<0.10	<0.10		
Endosulfan sulfate	1031-07-8	0.10	µg/L	<0.10	<0.10	<0.10		
4.4`-DDT	50-29-3	0.10	µg/L	<0.10	<0.10	<0.10		
4.4`-DDD	72-54-8	0.10	µg/L	<0.10	<0.10	<0.10		
4.4`-DDE	72-55-9	0.10	µg/L	<0.10	<0.10	<0.10		
EP-390: Triorganotins								
Tributyltin	56573-85-4	0.015	µg TBT /L	<0.015	<0.015	<0.015		
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
Nitrobenzene -d5	4165-60-0	0.1	%	**60.0**	**70.0**	**82.5**		
4-Terphenyl-d14	1718-51-0	0.1	%	**95.9**	**105**	**112**		
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate							Surrogate control limits listed at end of this report.	
Decachlorobiphenyl	2051-24-3	0.1	%	**78.6**	**72.1**	**83.7**		
EP-067S: Pesticide Surrogate							Surrogate control limits listed at end of this report.	
Dibutylchlorendate	1770-80-5	0.1	%	**105**	**57.9**	**71.3**		

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 (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1945307)								
HK1120450-009	BLANK WATER SAMPLE	EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/L	<1	<1	0.0
HK1120720-009	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	0.7	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1945308)								
HK1120450-009	BLANK WATER SAMPLE	EK067A: Total Phosphorus as P	----	0.02	mg/L	0.02	0.02	0.0
HK1120720-026	Anonymous	EK067A: Total Phosphorus as P	----	0.1	mg/L	0.3	0.3	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1947343)								
HK1120450-009	BLANK WATER SAMPLE	EK071K: Reactive Phosphorus as P	----	0.005	mg/L	<0.005	<0.01	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1950668)								
HK1120450-009	BLANK WATER SAMPLE	EK057A: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0
HK1120887-005	Anonymous	EK057A: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1951475)								
HK1120450-009	BLANK WATER SAMPLE	EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.06	0.05	18.2
EG: Metals and Major Cations - Filtered (QC Lot: 1946370)								
HK1120450-009	BLANK WATER SAMPLE	EG020: Mercury	7439-97-6	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
		EG020: Chromium	7440-47-3	1	µg/L	<1	<1	0.0
		EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.0
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	µg/L	3	3	0.0
		EG020: Silver	7440-22-4	1	µg/L	<1	<1	0.0
		EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.0
		EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
HK1120599-012	Anonymous	EG020: Mercury	7439-97-6	0.1	µg/L	<0.1	<0.1	0.0
		EG020: Cadmium	7440-43-9	1	µg/L	<1	<1	0.0
		EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.0
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
		EG020: Silver	7440-22-4	1	µg/L	<1	<1	0.0
		EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.0
		EG020: Chromium	7440-47-3	10	µg/L	<10	<10	0.0
		EG020: Zinc	7440-66-6	25	µg/L	<25	<25	0.0
		EG020: Nickel	7440-02-0	5	µg/L	<5	<5	0.0
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 1940572)								
HK1120450-009	BLANK WATER SAMPLE	Naphthalene	91-20-3	0.2	µg/L	<0.2	<0.2	0.0
		Acenaphthylene	208-96-8	0.2	µg/L	<0.2	<0.2	0.0
		Acenaphthene	83-32-9	0.2	µg/L	<0.2	<0.2	0.0
		Fluorene	86-73-7	0.2	µg/L	<0.2	<0.2	0.0
		Phenanthrene	85-01-8	0.2	µg/L	<0.2	<0.2	0.0
		Anthracene	120-12-7	0.2	µg/L	<0.2	<0.2	0.0
		Fluoranthene	206-44-0	0.2	µg/L	<0.2	<0.2	0.0
		Pyrene	129-00-0	0.2	µg/L	<0.2	<0.2	0.0
		Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	<0.2	0.0
		Chrysene	218-01-9	0.2	µg/L	<0.2	<0.2	0.0

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 1940572) - Continued								
HK1120450-009	BLANK WATER SAMPLE	**Benzo(a)pyrene**	50-32-8	0.2	µg/L	<0.2	<0.2	0.0
		Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	<0.2	0.0
		Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	<0.2	0.0
		Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	<0.2	0.0
		Benzo(b) & Benzo(k)fluoranthene	205-99-2 207-08-9	0.4	µg/L	<0.4	<0.4	0.0
		Low M.W. PAHs	----	2.2	µg/L	<2.2	<2.2	0.0
		High M.W. PAHs	----	6.8	µg/L	<6.8	<6.8	0.0
EP-065A: PCB Single Congeners (QC Lot: 1940128)								
HK1120450-009	BLANK WATER SAMPLE	**PCB 8**	34883-43-7	0.01	µg/L	<0.01	<0.01	0.0
		PCB 18	37680-65-2	0.01	µg/L	<0.01	<0.01	0.0
		PCB 28	7012-37-5	0.01	µg/L	<0.01	<0.01	0.0
		PCB 52	35693-99-3	0.01	µg/L	<0.01	<0.01	0.0
		PCB 44	41464-39-5	0.01	µg/L	<0.01	<0.01	0.0
		PCB 66	32598-10-0	0.01	µg/L	<0.01	<0.01	0.0
		PCB 101	37680-73-2	0.01	µg/L	<0.01	<0.01	0.0
		PCB 77	32598-13-3	0.01	µg/L	<0.01	<0.01	0.0
		PCB 118	31508-00-6	0.01	µg/L	<0.01	<0.01	0.0
		PCB 153	35065-27-1	0.01	µg/L	<0.01	<0.01	0.0
		PCB 105	32598-14-4	0.01	µg/L	<0.01	<0.01	0.0
		PCB 126	57465-28-8	0.01	µg/L	<0.01	<0.01	0.0
		PCB 187	52663-68-0	0.01	µg/L	<0.01	<0.01	0.0
		PCB 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
		PCB 180	35065-29-3	0.01	µg/L	<0.01	<0.01	0.0
		PCB 169	32774-16-6	0.01	µg/L	<0.01	<0.01	0.0
		PCB 170	35065-30-6	0.01	µg/L	<0.01	<0.01	0.0
EP-067A: Organochlorine Pesticides (OC) (QC Lot: 1940573)								
HK1120450-009	BLANK WATER SAMPLE	**Aldrin**	309-00-2	0.10	µg/L	<0.10	<0.10	0.0
		alpha-BHC	319-84-6	0.10	µg/L	<0.10	<0.10	0.0
		beta-BHC	319-85-7	0.10	µg/L	<0.10	<0.10	0.0
		gamma-BHC	58-89-9	0.10	µg/L	<0.10	<0.10	0.0
		delta-BHC	319-86-8	0.10	µg/L	<0.10	<0.10	0.0
		Heptachlor	76-44-8	0.10	µg/L	<0.10	<0.10	0.0
		Heptachlor epoxide	1024-57-3	0.10	µg/L	<0.10	<0.10	0.0
		Endosulfan 1	959-98-8	0.10	µg/L	<0.10	<0.10	0.0
		Endosulfan sulfate	1031-07-8	0.10	µg/L	<0.10	<0.10	0.0
		4.4`-DDT	50-29-3	0.10	µg/L	<0.10	<0.10	0.0
		4.4`-DDD	72-54-8	0.10	µg/L	<0.10	<0.10	0.0
		4.4`-DDE	72-55-9	0.10	µg/L	<0.10	<0.10	0.0
EP-390: Triorganotins (QC Lot: 1950262)								
HK1120444-001	Anonymous	**Tributyltin**	56573-85-4	6	ngSn/L	<6	<6	0.0

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

Matrix: WATER

Method Blank (MB) Report	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
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1945307)											
EK061A: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	0.5 mg/L	105	----	85	115	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1945308)											
EK067A: Total Phosphorus as P	----	0.1	mg/L	<0.1	0.5 mg/L	95.9	----	85	115	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1947343)											
EK071K: Reactive Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	104	----	85	115	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1950668)											
EK057A: Nitrite as N	----	0.01	mg/L	<0.01	0.4 mg/L	98.8	----	85	115	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1951475)											
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	109	----	85	115	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 1946370)											
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	97.9	----	85	115	----	----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	110	----	85	115	----	----
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	106	----	85	115	----	----
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	105	----	85	115	----	----
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	102	----	85	115	----	----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	98.5	----	85	115	----	----
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	107	----	85	115	----	----
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	94.0	----	85	115	----	----
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	112	----	85	115	----	----
EP-076: Polycyclic Aromatics Hydrocarbons (PAHs) (QC Lot: 1940572)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	1 µg/L	68.1	----	32	98	----	----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	1 µg/L	83.8	----	34	84	----	----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	1 µg/L	78.0	----	32	91	----	----
Fluorene	86-73-7	0.2	µg/L	<0.2	1 µg/L	78.6	----	34	92	----	----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	1 µg/L	89.0	----	30	102	----	----
Anthracene	120-12-7	0.2	µg/L	<0.2	1 µg/L	76.2	----	33	98	----	----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	1 µg/L	93.7	----	46	110	----	----
Pyrene	129-00-0	0.2	µg/L	<0.2	1 µg/L	92.1	----	47	107	----	----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	1 µg/L	95.3	----	47	119	----	----
Chrysene	218-01-9	0.2	µg/L	<0.2	1 µg/L	79.9	----	47	112	----	----
Benzo(b) & Benzo(k)fluoranthene	205-99-2 207-08-9	0.4	µg/L	<0.4	2 µg/L	84.0	----	9	137	----	----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	1 µg/L	75.1	----	40	116	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	1 µg/L	75.0	----	54	123	----	----
Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<0.2	1 µg/L	76.6	----	54	104	----	----
Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<0.2	1 µg/L	84.9	----	32	116	----	----
Low M.W. PAHs	----	2.2	µg/L	<2.2	----	----	----	----	----	----	----
High M.W. PAHs	----	6.8	µg/L	<6.8	----	----	----	----	----	----	----
EP-065A: PCB Single Congeners (QC Lot: 1940128)											
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	52.7	----	50	130	----	----
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	55.3	----	50	130	----	----

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-065A: PCB Single Congeners (QC Lot: 1940128) - Continued											
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	60.5	----	50	130	----	----
PCB 52	35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	64.8	----	50	130	----	----
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	66.6	----	50	130	----	----
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	69.4	----	50	130	----	----
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	64.1	----	50	130	----	----
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	68.5	----	50	130	----	----
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	66.9	----	50	130	----	----
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	66.6	----	50	130	----	----
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	67.7	----	50	130	----	----
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	69.2	----	50	130	----	----
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	66.7	----	50	130	----	----
PCB 128	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	69.0	----	50	130	----	----
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	69.6	----	50	130	----	----
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	70.6	----	50	130	----	----
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	69.7	----	50	130	----	----
EP-067A: Organochlorine Pesticides (OC) (QC Lot: 1940573)											
Aldrin	309-00-2	0.02	µg/L	<0.02	0.1 µg/L	53.9	----	50	130	----	----
alpha-BHC	319-84-6	0.02	µg/L	<0.02	0.1 µg/L	53.3	----	50	130	----	----
beta-BHC	319-85-7	0.02	µg/L	<0.02	0.1 µg/L	54.3	----	50	130	----	----
gamma-BHC	58-89-9	0.02	µg/L	<0.02	0.1 µg/L	57.6	----	50	130	----	----
delta-BHC	319-86-8	0.02	µg/L	<0.02	0.1 µg/L	59.1	----	50	130	----	----
Heptachlor	76-44-8	0.02	µg/L	<0.02	0.1 µg/L	77.2	----	50	130	----	----
Heptachlor epoxide	1024-57-3	0.02	µg/L	<0.02	0.1 µg/L	62.0	----	50	130	----	----
Endosulfan 1	959-98-8	0.02	µg/L	<0.02	0.1 µg/L	55.6	----	50	130	----	----
Endosulfan sulfate	1031-07-8	0.02	µg/L	<0.02	0.1 µg/L	68.6	----	50	130	----	----
4.4`-DDT	50-29-3	0.02	µg/L	<0.02	0.1 µg/L	90.7	----	50	130	----	----
4.4`-DDD	72-54-8	0.02	µg/L	<0.02	0.1 µg/L	72.6	----	50	130	----	----
4.4`-DDE	72-55-9	0.02	µg/L	<0.02	0.1 µg/L	61.8	----	50	130	----	----
EP-390: Triorganotins (QC Lot: 1950262)											
Tributyltin	56573-85-4	5	ngSn/L	<5	5 ngSn/L	104	----	70	130	----	----

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
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1945307)										
HK1120450-009	BLANK WATER SAMPLE	EK061A: Total Kjeldahl Nitrogen as N	----	0.5 mg/L	96.6	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1945308)										
HK1120450-009	BLANK WATER SAMPLE	EK067A: Total Phosphorus as P	----	0.5 mg/L	108	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1947343)										
HK1120450-009	BLANK WATER SAMPLE	EK071K: Reactive Phosphorus as P	----	0.5 mg/L	102	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1950668)										
HK1120450-009	BLANK WATER SAMPLE	EK057A: Nitrite as N	----	0.5 mg/L	116	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 1951475)										
HK1120450-009	BLANK WATER SAMPLE	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	90.0	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 1946370)										
HK1120599-001	Anonymous	EG020: Arsenic	7440-38-2	10 µg/L	99.0	----	75	125	----	----
		EG020: Cadmium	7440-43-9	10 µg/L	111	----	75	125	----	----
		EG020: Chromium	7440-47-3	10 µg/L	96.2	----	75	125	----	----
		EG020: Copper	7440-50-8	10 µg/L	87.9	----	75	125	----	----
		EG020: Lead	7439-92-1	10 µg/L	92.4	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.2 µg/L	91.5	----	75	125	----	----
		EG020: Nickel	7440-02-0	10 µg/L	95.6	----	75	125	----	----
		EG020: Silver	7440-22-4	10 µg/L	97.5	----	75	125	----	----
		EG020: Zinc	7440-66-6	10 µg/L	105	----	75	125	----	----

Surrogate Control Limits

Sub-Matrix: ELUTRIATE

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates			
Nitrobenzene -d5	4165-60-0	50	130
4-Terphenyl-d14	1718-51-0	50	130
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate			
Decachlorobiphenyl	2051-24-3	50	130
EP-067S: Pesticide Surrogate			
Dibutylchlorendate	1770-80-5	50	130

Section 3

Summary of Sample Receipt Condition and Analysis Date

Summary of Sample Receipt Condition and Analysis Date

Date of Issue: 19/10/2011
Client: Civil Engineering and Development Department
Service Order No.: GE/2009/16.24
Project: Agreement No. CE 53/2008(CE) Planning and Engineering Study on Development of Lok Ma Chau Loop- Investigation Request for Sediment Sampling and Testing at Old Shenzhen River

ALS Lab ID	Client Sample ID	Sampling Date	Receipt Details			Storage Condition*	Testing Date				
			Date	Time	Condition		Metals	Inorganic Nonmetallic Parameters	PAHs	PCBs	TBT
HK1120444001	GR5	31/08/2011	31/08/2011	15:00	4°C	4°C	5/09/2011	--	9/09/2011	10/09/2011	9/09/2011
HK1120444002	GR6	31/08/2011	31/08/2011	15:00	4°C	4°C	5/09/2011	--	9/09/2011	10/09/2011	9/09/2011
HK1120444003	GR7	31/08/2011	31/08/2011	15:00	4°C	4°C	5/09/2011	--	9/09/2011	10/09/2011	9/09/2011
HK1120444004	GR8	31/08/2011	31/08/2011	15:00	4°C	4°C	5/09/2011	--	9/09/2011	10/09/2011	9/09/2011
HK1120444005	GR9	31/08/2011	31/08/2011	15:00	4°C	4°C	5/09/2011	--	9/09/2011	10/09/2011	9/09/2011
HK1120444006	GR10	31/08/2011	31/08/2011	15:00	4°C	4°C	5/09/2011	--	9/09/2011	10/09/2011	9/09/2011
HK1120444007	GR11	31/08/2011	31/08/2011	15:00	4°C	4°C	5/09/2011	--	9/09/2011	10/09/2011	9/09/2011
HK1120450001	GR5 #	31/08/2011	31/08/2011	15:00	--	4°C	12/09/2011	12/09/2011	9/09/2011	12/09/2011	10/09/2011
HK1120450002	GR6 #	31/08/2011	31/08/2011	15:00	--	4°C	12/09/2011	12/09/2011	9/09/2011	12/09/2011	10/09/2011
HK1120450003	GR7 #	31/08/2011	31/08/2011	15:00	--	4°C	12/09/2011	12/09/2011	9/09/2011	12/09/2011	10/09/2011
HK1120450004	GR8 #	31/08/2011	31/08/2011	15:00	--	4°C	12/09/2011	12/09/2011	9/09/2011	12/09/2011	10/09/2011
HK1120450005	GR9 #	31/08/2011	31/08/2011	15:00	--	4°C	12/09/2011	12/09/2011	9/09/2011	12/09/2011	10/09/2011
HK1120450006	GR10 #	31/08/2011	31/08/2011	15:00	--	4°C	12/09/2011	12/09/2011	9/09/2011	12/09/2011	10/09/2011
HK1120450007	GR11 #	31/08/2011	31/08/2011	15:00	--	4°C	12/09/2011	12/09/2011	9/09/2011	12/09/2011	10/09/2011
HK1120450009	Blank Water Sample	31/08/2011	31/08/2011	15:00	4°C	4°C	12/09/2011	12/09/2011	9/09/2011	12/09/2011	10/09/2011

***Container for sample storage:** 250mL Glass Jar with Teflon Lined Lid (for Chemical Testing) & High Density Polyethylene Bags (for Biological Testing)
Elutriate Sample

Section 4

Chain of Custody (COC) Form

CHAIN OF CUSTODY DOCUMENTATION

H 020498

ALS Laboratory Group

CLIENT:	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): Lo Wing Fan	PHONE 3191 5777
PROJECT ID: 48/2010/02.45	EMAIL REPORT TO:
SITE: LOK MA CHAU 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		Cd	Cr	Cu	Hg	Ni	Pb	Zn	As	PAHs	Total PCBs	TBT
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles											
	GR 5	1			Grab	2 bags & 1 small bottle	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	GR 6				"	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	GR 7		20/08/31		"	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	GR 8				"	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	GR 9				"	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	GR 10				"	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	GR 11	↓			"	"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	~~GR5 to GR11~~				Water	3 bottles											

RELINQUISHED BY:		RECEIVED BY		METHOD OF SHIPMENT
Name: Leung Wai Kwong	Date: 31/08/2011	Name:	Date: 31/8/11	Con' Note No:
Of: Gammon	Time:	Of: ALS	Time: 1700	
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.

CHAIN OF CUSTODY DOCUMENTATION

H 020499

ALS Laboratory Group

CLIENT:	SAMPLER:
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): Lo Wing Fan	PHONE 31915227
PROJECT ID: GE 1210/024	EMAIL REPORT TO:
SITE: Lok Ma Chau 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

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	Test: Inorganic chemical	Organic chemical test	Ammonia	Nitrite as N	Nitrate as N	TKN as N	Total P	Reactive P	Chlorinated Pesticides				
	GR5 To GR11		2011/08/31		water	3 bottles	✓	✓	✓	✓	✓	✓	✓	✓	✓				3X20 Litres Water

RELINQUISHED BY:

Name: Leung Wai Keung	Date: 31/08/2011
Of: Grammon	Time:
Name:	Date:
Of:	Time:

RECEIVED BY

Name:	Date: 31/8/11
Of:	Time: 1700
Name:	Date:
Of:	Time:

METHOD OF SHIPMENT

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.