

Annex 5E

Sediment Testing Report



CEDD Contract No. GE/2014/21

Chemical and Biological Testing (Service Contract)

Service Order No. GE/2014/21.01

*Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok
Sewage Treatment Works, Phase 1 - Investigation, Design and
Construction*

Laboratory Chemical Testing Report (Final Report)

Prepared for

Civil Engineering and Development Department

Prepared By

ALS Technichem (HK) Pty Ltd

May 13, 2015



CEDD Contract No. GE/2014/21

Chemical and Biological Testing (Service Contract)

Service Order No. GE/2014/21.01

Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

Laboratory Chemical Testing Report (Final Report)


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Date: May 13, 2015



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Section 1

Summary Report

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1504844001	HK1504844002	HK1504844003	HK1504844004
Sampling Date	2/02/2015	2/02/2015	2/02/2015	2/02/2015
Client Sample ID	GB1	GB2	GB4	GB5
Units				
Inorganic Nonmetallic Parameters				
Moisture Content (dried @ 103°C)	53.1	59.9	61.4	54.2
Ammonia as N	mg/kg 8.7	mg/kg 14.3	mg/kg 9.8	mg/kg 8.8
Total Kjeldahl Nitrogen as N	mg/kg 1510	mg/kg 1510	mg/kg 1670	mg/kg 1700
Total Phosphorus as P	mg/kg 505	mg/kg 491	mg/kg 532	mg/kg 560
Nitrate as N (Sol.)	mg/kg <0.1	mg/kg <0.1	mg/kg <0.1	mg/kg <0.1
Nitrite as N (Sol.)	mg/kg <0.1	mg/kg <0.1	mg/kg <0.1	mg/kg <0.1
Organochlorine Pesticides (OC)				
alpha-BHC	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
beta-BHC	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
gamma-BHC	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
delta-BHC	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
Heptachlor	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
Aldrin	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
Heptachlor epoxide	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
Endosulfan 1	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
4,4'-DDE	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
4,4'-DDD	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
Endosulfan sulfate	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50
4,4'-DDT	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50	mg/kg <0.50

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
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ALS Lab ID	HK1504956001	HK1504956002
Sampling Date	4/02/2015	4/02/2015
Client Sample ID	GB3	GB8
	Units	
Inorganic Nonmetallic Parameters		
Moisture Content (dried @ 103°C)	%	53.2
Ammonia as N	mg/kg	9.3
Total Kjeldahl Nitrogen as N	mg/kg	1600
Total Phosphorus as P	mg/kg	557
Nitrate as N (Sol.)	mg/kg	<0.1
Nitrite as N (Sol.)	mg/kg	<0.1
Organochlorine Pesticides (OC)		
alpha-BHC	mg/kg	<0.50
beta-BHC	mg/kg	<0.50
gamma-BHC	mg/kg	<0.50
delta-BHC	mg/kg	<0.50
Heptachlor	mg/kg	<0.50
Aldrin	mg/kg	<0.50
Heptachlor epoxide	mg/kg	<0.50
Endosulfan 1	mg/kg	<0.50
4,4'-DDE	mg/kg	<0.50
4,4'-DDD	mg/kg	<0.50
Endosulfan sulfate	mg/kg	<0.50
4,4'-DDT	mg/kg	<0.50

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1505597001	HK1505597002
Sampling Date	10/02/2015	10/02/2015
Client Sample ID	GB6	GB7
	Units	
Inorganic Nonmetallic Parameters		
Moisture Content (dried @ 103°C)	%	28.1
Ammonia as N	mg/kg	3.6
Total Kjeldahl Nitrogen as N	mg/kg	459
Total Phosphorus as P	mg/kg	256
Nitrate as N (Sol.)	mg/kg	<0.1
Nitrite as N (Sol.)	mg/kg	<0.1
Organochlorine Pesticides (OC)		
alpha-BHC	mg/kg	<0.50
beta-BHC	mg/kg	<0.50
gamma-BHC	mg/kg	<0.50
delta-BHC	mg/kg	<0.50
Heptachlor	mg/kg	<0.50
Aldrin	mg/kg	<0.50
Heptachlor epoxide	mg/kg	<0.50
Endosulfan 1	mg/kg	<0.50
4,4'-DDE	mg/kg	<0.50
4,4'-DDD	mg/kg	<0.50
Endosulfan sulfate	mg/kg	<0.50
4,4'-DDT	mg/kg	<0.50

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Service Order No.: GE/2014/21.01
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ALS Lab ID	HK1505110001	HK1505110002	HK1505110003	HK1505110004
Sampling Date	5/02/2015	5/02/2015	5/02/2015	5/02/2015
Client Sample ID	SD1	SD1	SD1	SD1
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M
Inorganic Nonmetallic Parameters				
Moisture Content (dried @ 103°C)	46.4	41.1	37.3	27.2
Ammonia as N	5.6	4.4	2.2	1.4
Total Kjeldahl Nitrogen as N	1040	883	676	342
Total Phosphorus as P	472	431	544	286
Nitrate as N (Sol.)	<0.1	<0.1	<0.1	<0.1
Nitrite as N (Sol.)	<0.1	<0.1	<0.1	<0.1
Organochlorine Pesticides (OC)				
alpha-BHC	<0.50	<0.50	<0.50	<0.50
beta-BHC	<0.50	<0.50	<0.50	<0.50
gamma-BHC	<0.50	<0.50	<0.50	<0.50
delta-BHC	<0.50	<0.50	<0.50	<0.50
Heptachlor	<0.50	<0.50	<0.50	<0.50
Aldrin	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	<0.50	<0.50	<0.50	<0.50
Endosulfan 1	<0.50	<0.50	<0.50	<0.50
4,4'-DDE	<0.50	<0.50	<0.50	<0.50
4,4'-DDD	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	<0.50	<0.50	<0.50	<0.50
4,4'-DDT	<0.50	<0.50	<0.50	<0.50

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ALS Lab ID	HK1504954001	HK1504954002	HK1504954003	HK1504954004	HK1504954005
Sampling Date	4/02/2015	4/02/2015	4/02/2015	4/02/2015	4/02/2015
Client Sample ID	SD2	SD2	SD2	SD2	SD2
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M	5.9M-6.9M
Inorganic Nonmetallic Parameters					
Moisture Content (dried @ 103°C)	57.3	47.7	43.8	39.7	12.2
Ammonia as N	13.6	8	5.7	4.2	<1.0
Total Kjeldahl Nitrogen as N	1400	853	941	702	38
Total Phosphorus as P	454	490	391	455	252
Nitrate as N (Sol.)	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N (Sol.)	<0.1	<0.1	<0.1	<0.1	<0.1
Organochlorine Pesticides (OC)					
alpha-BHC	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	<0.50	<0.50	<0.50	<0.50	<0.50
Aldrin	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan 1	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDE	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDD	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDT	<0.50	<0.50	<0.50	<0.50	<0.50

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ALS Lab ID	HK1505114001	HK1505114002	HK1505114003	HK1505114004
Sampling Date	6/02/2015	6/02/2015	6/02/2015	6/02/2015
Client Sample ID	SD4	SD4	SD4	SD4
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M
Inorganic Nonmetallic Parameters				
Moisture Content (dried @ 103°C)	44.2	43.7	42.4	40.9
Ammonia as N	8.8	7.3	5.9	4.5
Total Kjeldahl Nitrogen as N	800	838	831	564
Total Phosphorus as P	424	430	477	384
Nitrate as N (Sol.)	<0.1	<0.1	<0.1	<0.1
Nitrite as N (Sol.)	<0.1	<0.1	<0.1	<0.1
Organochlorine Pesticides (OC)				
alpha-BHC	<0.50	<0.50	<0.50	<0.50
beta-BHC	<0.50	<0.50	<0.50	<0.50
gamma-BHC	<0.50	<0.50	<0.50	<0.50
delta-BHC	<0.50	<0.50	<0.50	<0.50
Heptachlor	<0.50	<0.50	<0.50	<0.50
Aldrin	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	<0.50	<0.50	<0.50	<0.50
Endosulfan 1	<0.50	<0.50	<0.50	<0.50
4,4'-DDE	<0.50	<0.50	<0.50	<0.50
4,4'-DDD	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	<0.50	<0.50	<0.50	<0.50
4,4'-DDT	<0.50	<0.50	<0.50	<0.50

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ALS Lab ID	HK1504951001	HK1504951002	HK1504951003	HK1504951004
Sampling Date	3/02/2015	3/02/2015	3/02/2015	3/02/2015
Client Sample ID	SD5 0M-0.9M	SD5 0.9M-1.9M	SD5 1.9M-2.9M	SD5 2.9M-3.9M
Units				
Inorganic Nonmetallic Parameters				
Moisture Content (dried @ 103°C)	45.6	36.7	39.1	32.3
Ammonia as N	10.8	4.6	4.1	3.1
Total Kjeldahl Nitrogen as N	1110	787	795	431
Total Phosphorus as P	486	378	434	282
Nitrate as N (Sol.)	<0.1	<0.1	<0.1	<0.1
Nitrite as N (Sol.)	<0.1	<0.1	<0.1	<0.1
Organochlorine Pesticides (OC)				
alpha-BHC	<0.50	<0.50	<0.50	<0.50
beta-BHC	<0.50	<0.50	<0.50	<0.50
gamma-BHC	<0.50	<0.50	<0.50	<0.50
delta-BHC	<0.50	<0.50	<0.50	<0.50
Heptachlor	<0.50	<0.50	<0.50	<0.50
Aldrin	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	<0.50	<0.50	<0.50	<0.50
Endosulfan 1	<0.50	<0.50	<0.50	<0.50
4,4'-DDE	<0.50	<0.50	<0.50	<0.50
4,4'-DDD	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	<0.50	<0.50	<0.50	<0.50
4,4'-DDT	<0.50	<0.50	<0.50	<0.50

Summary Report

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Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1506971001	HK1506971002	HK1506971003	HK1506971004	HK1506971005
Sampling Date	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Client Sample ID	SD6 0M-0.9M	SD6 0.9M-1.9M	SD6 1.9M-2.9M	SD6 2.9M-3.9M	SD6 5.9M-6.9M
Units					
Inorganic Nonmetallic Parameters					
Moisture Content (dried @ 103°C)	15.8	18	21.4	17.3	32.1
Ammonia as N	<1.0	<1.0	1.9	2	8.1
Total Kjeldahl Nitrogen as N	44	110	201	99	608
Total Phosphorus as P	62	109	125	92	184
Nitrate as N (Sol.)	0.1	0.2	0.1	0.2	0.1
Nitrite as N (Sol.)	<0.1	<0.1	<0.1	<0.1	<0.1
Organochlorine Pesticides (OC)					
alpha-BHC	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	<0.50	<0.50	<0.50	<0.50	<0.50
Aldrin	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan 1	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDE	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDD	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDT	<0.50	<0.50	<0.50	<0.50	<0.50

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
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ALS Lab ID	HK1507201001	HK1507201002	HK1507201003	HK1507201004
Sampling Date	27/02/2015	27/02/2015	27/02/2015	27/02/2015
Client Sample ID	SD7	SD7	SD7	SD7
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M
Inorganic Nonmetallic Parameters				
Moisture Content (dried @ 103°C)	19.2	19.5	19.3	18.8
Ammonia as N	<1.0	1.4	2	2.1
Total Kjeldahl Nitrogen as N	120	230	216	170
Total Phosphorus as P	127	179	177	129
Nitrate as N (Sol.)	<0.1	<0.1	<0.1	<0.1
Nitrite as N (Sol.)	<0.1	<0.1	<0.1	<0.1
Organochlorine Pesticides (OC)				
alpha-BHC	<0.50	<0.50	<0.50	<0.50
beta-BHC	<0.50	<0.50	<0.50	<0.50
gamma-BHC	<0.50	<0.50	<0.50	<0.50
delta-BHC	<0.50	<0.50	<0.50	<0.50
Heptachlor	<0.50	<0.50	<0.50	<0.50
Aldrin	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	<0.50	<0.50	<0.50	<0.50
Endosulfan 1	<0.50	<0.50	<0.50	<0.50
4,4'-DDE	<0.50	<0.50	<0.50	<0.50
4,4'-DDD	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	<0.50	<0.50	<0.50	<0.50
4,4'-DDT	<0.50	<0.50	<0.50	<0.50

Summary Report

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ALS Lab ID	HK1507058001	HK1507058002	HK1507058003	HK1507058004
Sampling Date	26/02/2015	26/02/2015	26/02/2015	26/02/2015
Client Sample ID	SD8	SD8	SD8	SD8
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M
Inorganic Nonmetallic Parameters				
Moisture Content (dried @ 103°C)	51.6	49.1	17.6	21.1
Ammonia as N	mg/kg	7.8	6.5	<1.0
Total Kjeldahl Nitrogen as N	mg/kg	1200	1030	102
Total Phosphorus as P	mg/kg	417	395	81
Nitrate as N (Sol.)	mg/kg	0.3	0.2	<0.1
Nitrite as N (Sol.)	mg/kg	<0.1	<0.1	<0.1
Organochlorine Pesticides (OC)				
alpha-BHC	mg/kg	<0.50	<0.50	<0.50
beta-BHC	mg/kg	<0.50	<0.50	<0.50
gamma-BHC	mg/kg	<0.50	<0.50	<0.50
delta-BHC	mg/kg	<0.50	<0.50	<0.50
Heptachlor	mg/kg	<0.50	<0.50	<0.50
Aldrin	mg/kg	<0.50	<0.50	<0.50
Heptachlor epoxide	mg/kg	<0.50	<0.50	<0.50
Endosulfan 1	mg/kg	<0.50	<0.50	<0.50
4,4'-DDE	mg/kg	<0.50	<0.50	<0.50
4,4'-DDD	mg/kg	<0.50	<0.50	<0.50
Endosulfan sulfate	mg/kg	<0.50	<0.50	<0.50
4,4'-DDT	mg/kg	<0.50	<0.50	<0.50

Summary Report

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Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK15098001
Sampling Date	20/03/2015
Client Sample ID	RGS1
	Units
Inorganic Nonmetallic Parameters	
Moisture Content (dried @ 103°C)	%
Ammonia as N	mg/kg
Total Kjeldahl Nitrogen as N	mg/kg
Total Phosphorus as P	mg/kg
Nitrate as N (Sol.)	mg/kg
Nitrite as N (Sol.)	mg/kg
Organochlorine Pesticides (OC)	
alpha-BHC	mg/kg
beta-BHC	mg/kg
gamma-BHC	mg/kg
delta-BHC	mg/kg
Heptachlor	mg/kg
Aldrin	mg/kg
Heptachlor epoxide	mg/kg
Endosulfan 1	mg/kg
4,4'-DDE	mg/kg
4,4'-DDD	mg/kg
Endosulfan sulfate	mg/kg
4,4'-DDT	mg/kg

Summary Report

Date of Issue: 23/04/2015
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ALS Lab ID	HK1505598001	HK1505598002	HK1505598003	HK1505598004
Sampling Date	10/02/2015	10/02/2015	10/02/2015	10/02/2015
Client Sample ID	GB6	GB7	GB6	GB7
Units			ELUTRIATE BLK	ELUTRIATE BLK
Inorganic Nonmetallic Parameters				
Ammonia as N	mg/L	0.43	0.2	0.19
Reactive Phosphorus as P	µg/L	20	10	30
Total Kjeldahl Nitrogen as N	mg/L	1.2	0.9	0.4
Total Phosphorus as P	mg/L	0.06	0.05	0.05
Nitrate as N	mg/L	0.01	0.04	0.47
Nitrite as N	mg/L	<0.01	<0.01	0.02
Metals				
Arsenic	µg/L	<10	<10	<10
Cadmium	µg/L	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1
Copper	µg/L	1	2	2
Lead	µg/L	<1	<1	<1
Mercury	µg/L	<0.5	<0.5	<0.5
Nickel	µg/L	1	1	<1
Silver	µg/L	3	<1	<1
Zinc	µg/L	<10	<10	<10
PCB Single Congeners				
PCB 8	µg/L	<0.01	<0.01	<0.01
PCB 18	µg/L	<0.01	<0.01	<0.01
PCB 28	µg/L	<0.01	<0.01	<0.01
PCB 44	µg/L	<0.01	<0.01	<0.01
PCB 52	µg/L	<0.01	<0.01	<0.01
PCB 66	µg/L	<0.01	<0.01	<0.01
PCB 77	µg/L	<0.01	<0.01	<0.01
PCB 101	µg/L	<0.01	<0.01	<0.01
PCB 105	µg/L	<0.01	<0.01	<0.01
PCB 118	µg/L	<0.01	<0.01	<0.01
PCB 126	µg/L	<0.01	<0.01	<0.01
PCB 128	µg/L	<0.01	<0.01	<0.01
PCB 138	µg/L	<0.01	<0.01	<0.01
PCB 153	µg/L	<0.01	<0.01	<0.01
PCB 169	µg/L	<0.01	<0.01	<0.01
PCB 170	µg/L	<0.01	<0.01	<0.01
PCB 180	µg/L	<0.01	<0.01	<0.01
PCB 187	µg/L	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	µg/L	<0.18	<0.18	<0.18

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1505598001	HK1505598002	HK1505598003	HK1505598004
Sampling Date	10/02/2015	10/02/2015	10/02/2015	10/02/2015
Client Sample ID	GB6	GB7	GB6	GB7
Units			ELUTRIATE BLK	ELUTRIATE BLK
Organochlorine Pesticides (OC)				
alpha-BHC	<0.1	<0.1	<0.1	<0.1
beta-BHC	<0.1	<0.1	<0.1	<0.1
gamma-BHC	<0.1	<0.1	<0.1	<0.1
delta-BHC	<0.1	<0.1	<0.1	<0.1
Heptachlor	<0.1	<0.1	<0.1	<0.1
Aldrin	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	<0.1	<0.1	<0.1	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)				
Naphthalene	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	<0.2	<0.2	<0.2	<0.2
Acenaphthene	<0.2	<0.2	<0.2	<0.2
Fluorene	<0.2	<0.2	<0.2	<0.2
Phenanthrene	<0.2	<0.2	<0.2	<0.2
Anthracene	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.2	<0.2	<0.2	<0.2
Pyrene	<0.2	<0.2	<0.2	<0.2
Benz(a)anthracene	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-cd)pyrene	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	<0.2	<0.2	<0.2	<0.2
Benzo(g,h,i)perylene	<0.2	<0.2	<0.2	<0.2
Low M.W. PAHs	<2.2	<2.2	<2.2	<2.2
High M.W. PAHs	<6.8	<6.8	<6.8	<6.8

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1504958001	HK1504958002	HK1504958003	HK1504958004
Sampling Date	4/02/2015	4/02/2015	4/02/2015	4/02/2015
Client Sample ID	GB3	GB8	GB3	GB8
Units			ELUTRIATE BLK	ELUTRIATE BLK
Inorganic Nonmetallic Parameters				
Ammonia as N	0.82	0.32	0.06	0.09
Reactive Phosphorus as P	20	<10	<10	10
Total Kjeldahl Nitrogen as N	1.3	0.7	0.3	0.4
Total Phosphorus as P	0.06	0.03	0.01	0.03
Nitrate as N	0.04	0.08	0.1	0.25
Nitrite as N	<0.01	0.01	<0.01	<0.01
Metals				
Arsenic	<10	<10	<10	<10
Cadmium	<0.2	<0.2	<0.2	<0.2
Chromium	<1	<1	<1	<1
Copper	1	1	2	3
Lead	<1	<1	<1	<1
Mercury	<0.5	<0.5	<0.5	<0.5
Nickel	<1	<1	<1	<1
Silver	<1	<1	<1	<1
Zinc	<10	<10	<10	<10
PCB Single Congeners				
PCB 8	<0.01	<0.01	<0.01	<0.01
PCB 18	<0.01	<0.01	<0.01	<0.01
PCB 28	<0.01	<0.01	<0.01	<0.01
PCB 44	<0.01	<0.01	<0.01	<0.01
PCB 52	<0.01	<0.01	<0.01	<0.01
PCB 66	<0.01	<0.01	<0.01	<0.01
PCB 77	<0.01	<0.01	<0.01	<0.01
PCB 101	<0.01	<0.01	<0.01	<0.01
PCB 105	<0.01	<0.01	<0.01	<0.01
PCB 118	<0.01	<0.01	<0.01	<0.01
PCB 126	<0.01	<0.01	<0.01	<0.01
PCB 128	<0.01	<0.01	<0.01	<0.01
PCB 138	<0.01	<0.01	<0.01	<0.01
PCB 153	<0.01	<0.01	<0.01	<0.01
PCB 169	<0.01	<0.01	<0.01	<0.01
PCB 170	<0.01	<0.01	<0.01	<0.01
PCB 180	<0.01	<0.01	<0.01	<0.01
PCB 187	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	<0.18	<0.18	<0.18	<0.18

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1504958001	HK1504958002	HK1504958003	HK1504958004
Sampling Date	4/02/2015	4/02/2015	4/02/2015	4/02/2015
Client Sample ID	GB3	GB8	GB3	GB8
Units			ELUTRIATE BLK	ELUTRIATE BLK
Organochlorine Pesticides (OC)				
alpha-BHC	<0.1	<0.1	<0.1	<0.1
beta-BHC	<0.1	<0.1	<0.1	<0.1
gamma-BHC	<0.1	<0.1	<0.1	<0.1
delta-BHC	<0.1	<0.1	<0.1	<0.1
Heptachlor	<0.1	<0.1	<0.1	<0.1
Aldrin	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	<0.1	<0.1	<0.1	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)				
Naphthalene	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	<0.2	<0.2	<0.2	<0.2
Acenaphthene	<0.2	<0.2	<0.2	<0.2
Fluorene	<0.2	<0.2	<0.2	<0.2
Phenanthrene	<0.2	<0.2	<0.2	<0.2
Anthracene	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.2	<0.2	<0.2	<0.2
Pyrene	<0.2	<0.2	<0.2	<0.2
Benz(a)anthracene	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-cd)pyrene	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	<0.2	<0.2	<0.2	<0.2
Benzo(g,h,i)perylene	<0.2	<0.2	<0.2	<0.2
Low M.W. PAHs	<2.2	<2.2	<2.2	<2.2
High M.W. PAHs	<6.8	<6.8	<6.8	<6.8

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1505112001	HK1505112002	HK1505112003	HK1505112004	HK1505112005
Sampling Date	5/02/2015	5/02/2015	5/02/2015	5/02/2015	5/02/2015
Client Sample ID	SD1	SD1	SD1	SD1	SD1
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M	ELUTRIATE BLK
Inorganic Nonmetallic Parameters					
Ammonia as N	mg/L	0.4	0.32	0.18	0.04
Reactive Phosphorus as P	µg/L	110	70	20	<10
Total Kjeldahl Nitrogen as N	mg/L	0.9	0.8	0.6	0.3
Total Phosphorus as P	mg/L	0.15	0.16	0.1	0.06
Nitrate as N	mg/L	0.12	0.15	0.2	0.12
Nitrite as N	mg/L	0.03	<0.01	0.02	<0.01
Metals					
Arsenic	µg/L	20	10	<10	<10
Cadmium	µg/L	<0.2	0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1
Copper	µg/L	2	2	2	3
Lead	µg/L	<1	1	<1	<1
Mercury	µg/L	<0.5	<0.5	<0.5	<0.5
Nickel	µg/L	1	<1	<1	<1
Silver	µg/L	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	<10
PCB Single Congeners					
PCB 8	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 18	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 28	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 44	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 52	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 66	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 77	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 101	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 105	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 118	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 126	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 128	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 138	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 153	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 169	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 170	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 180	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 187	µg/L	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	µg/L	<0.18	<0.18	<0.18	<0.18

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1505112001	HK1505112002	HK1505112003	HK1505112004	HK1505112005
Sampling Date	5/02/2015	5/02/2015	5/02/2015	5/02/2015	5/02/2015
Client Sample ID	SD1	SD1	SD1	SD1	SD1
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M	ELUTRIATE BLK
Organochlorine Pesticides (OC)					
alpha-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	<0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthene	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	<0.2	<0.2	<0.2	<0.2	<0.2
Phenanthrene	<0.2	<0.2	<0.2	<0.2	<0.2
Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Benz(a)anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-cd)pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(g,h,i)perylene	<0.2	<0.2	<0.2	<0.2	<0.2
Low M.W. PAHs	<2.2	<2.2	<2.2	<2.2	<2.2
High M.W. PAHs	<6.8	<6.8	<6.8	<6.8	<6.8

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1504957001	HK1504957002	HK1504957003	HK1504957004	HK1504957005	HK1504957006
Sampling Date	4/02/2015	4/02/2015	4/02/2015	4/02/2015	4/02/2015	4/02/2015
Client Sample ID	SD2 0M-0.9M	SD2 0.9M-1.9M	SD2 1.9M-2.9M	SD2 2.9M-3.9M	SD2 5.9M-6.9M	SD2 ELUTRIATE BLK
Units						
Inorganic Nonmetallic Parameters						
Ammonia as N	mg/L	0.66	0.63	0.54	0.43	0.11
Reactive Phosphorus as P	µg/L	80	210	90	70	<10
Total Kjeldahl Nitrogen as N	mg/L	1.7	1.3	1	0.9	0.4
Total Phosphorus as P	mg/L	0.12	0.25	0.12	0.1	0.02
Nitrate as N	mg/L	0.08	0.08	0.09	0.13	0.14
Nitrite as N	mg/L	0.02	0.03	<0.01	0.01	<0.01
Metals						
Arsenic	µg/L	<10	10	<10	<10	<10
Cadmium	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1	<1
Copper	µg/L	2	2	2	1	2
Lead	µg/L	<1	<1	<1	<1	<1
Mercury	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	µg/L	<1	2	<1	<1	1
Silver	µg/L	2	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	<10	<10
PCB Single Congeners						
PCB 8	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 18	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 28	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 44	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 52	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 66	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 77	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 101	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 105	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 118	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 126	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 128	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 138	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 153	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 169	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 170	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 180	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 187	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1505116001	HK1505116002	HK1505116003	HK1505116004	HK1505116005
Sampling Date	6/02/2015	6/02/2015	6/02/2015	6/02/2015	6/02/2015
Client Sample ID	SD4	SD4	SD4	SD4	SD4
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M	ELUTRIATE BLK
Inorganic Nonmetallic Parameters					
Ammonia as N	1.09	0.68	0.53	0.5	0.03
Reactive Phosphorus as P	110	160	90	60	<10
Total Kjeldahl Nitrogen as N	1.6	1.3	1	0.9	0.3
Total Phosphorus as P	0.16	0.2	0.12	0.08	<0.01
Nitrate as N	0.07	0.14	0.22	0.11	0.09
Nitrite as N	0.06	<0.01	<0.01	<0.01	<0.01
Metals					
Arsenic	10	<10	<10	<10	<10
Cadmium	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	<1	<1	<1	<1	<1
Copper	2	2	2	2	2
Lead	<1	<1	<1	<1	<1
Mercury	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	1	<1	<1	<1	<1
Silver	<1	<1	<1	<1	<1
Zinc	<10	<10	<10	<10	<10
PCB Single Congeners					
PCB 8	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 18	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 28	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 44	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 52	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 66	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 77	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 101	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 105	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 118	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 126	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 128	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 138	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 153	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 169	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 170	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 180	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 187	<0.01	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	<0.18	<0.18	<0.18	<0.18	<0.18

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1505116001	HK1505116002	HK1505116003	HK1505116004	HK1505116005
Sampling Date	6/02/2015	6/02/2015	6/02/2015	6/02/2015	6/02/2015
Client Sample ID	SD4	SD4	SD4	SD4	SD4
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M	ELUTRIATE BLK
Organochlorine Pesticides (OC)					
alpha-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	<0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthene	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	<0.2	<0.2	<0.2	<0.2	<0.2
Phenanthrene	<0.2	<0.2	<0.2	<0.2	<0.2
Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Benz(a)anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-cd)pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(g,h,i)perylene	<0.2	<0.2	<0.2	<0.2	<0.2
Low M.W. PAHs	<2.2	<2.2	<2.2	<2.2	<2.2
High M.W. PAHs	<6.8	<6.8	<6.8	<6.8	<6.8

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1504952001	HK1504952002	HK1504952003	HK1504952004	HK1504952005
Sampling Date	3/02/2015	3/02/2015	3/02/2015	3/02/2015	3/02/2015
Client Sample ID	SD5 0M-0.9M	SD5 0.9M-1.9M	SD5 1.9M-2.9M	SD5 2.9M-3.9M	SD5 ELUTRIATE BLK
Units					
Inorganic Nonmetallic Parameters					
Ammonia as N	mg/L	0.58	0.47	0.45	0.04
Reactive Phosphorus as P	µg/L	200	140	140	<10
Total Kjeldahl Nitrogen as N	mg/L	1.4	0.9	1	0.3
Total Phosphorus as P	mg/L	0.25	0.16	0.19	<0.01
Nitrate as N	mg/L	0.06	0.14	0.09	0.09
Nitrite as N	mg/L	0.07	<0.01	0.06	<0.01
Metals					
Arsenic	µg/L	30	<10	20	<10
Cadmium	µg/L	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1
Copper	µg/L	1	2	2	2
Lead	µg/L	<1	<1	1	<1
Mercury	µg/L	<0.5	<0.5	<0.5	<0.5
Nickel	µg/L	1	<1	1	1
Silver	µg/L	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	<10
PCB Single Congeners					
PCB 8	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 18	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 28	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 44	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 52	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 66	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 77	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 101	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 105	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 118	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 126	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 128	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 138	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 153	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 169	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 170	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 180	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 187	µg/L	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	µg/L	<0.18	<0.18	<0.18	<0.18

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1504952001	HK1504952002	HK1504952003	HK1504952004	HK1504952005
Sampling Date	3/02/2015	3/02/2015	3/02/2015	3/02/2015	3/02/2015
Client Sample ID	SD5 0M-0.9M	SD5 0.9M-1.9M	SD5 1.9M-2.9M	SD5 2.9M-3.9M	SD5 ELUTRIATE BLK
Units					
Organochlorine Pesticides (OC)					
alpha-BHC	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
beta-BHC	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
gamma-BHC	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
delta-BHC	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
Heptachlor	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
Aldrin	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
Heptachlor epoxide	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
Endosulfan 1	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
4,4'-DDE	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
4,4'-DDD	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
Endosulfan sulfate	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
4,4'-DDT	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L	<0.1 µg/L
Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Acenaphthylene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Acenaphthene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Fluorene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Phenanthrene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Anthracene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Fluoranthene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Pyrene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Benz(a)anthracene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Chrysene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Benzo(b)fluoranthene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Benzo(k)fluoranthene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Benzo(a)pyrene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Indeno(1,2,3-cd)pyrene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Dibenz(a,h)anthracene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Benzo(g,h,i)perylene	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L	<0.2 µg/L
Low M.W. PAHs	<2.2 µg/L	<2.2 µg/L	<2.2 µg/L	<2.2 µg/L	<2.2 µg/L
High M.W. PAHs	<6.8 µg/L	<6.8 µg/L	<6.8 µg/L	<6.8 µg/L	<6.8 µg/L

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1506978001	HK1506978002	HK1506978003	HK1506978004	HK1506978005	HK1506978006
Sampling Date	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Client Sample ID	SD6 0M-0.9M	SD6 0.9M-1.9M	SD6 1.9M-2.9M	SD6 2.9M-3.9M	SD6 5.9M-6.9M	SD6 ELUTRIATE BLK
Units						
Inorganic Nonmetallic Parameters						
Ammonia as N	mg/L	0.16	0.17	0.42	0.66	0.88
Reactive Phosphorus as P	µg/L	20	30	60	80	<10
Total Kjeldahl Nitrogen as N	mg/L	0.5	0.5	0.8	1.1	1.4
Total Phosphorus as P	mg/L	0.03	0.04	0.08	0.09	<0.01
Nitrate as N	mg/L	0.32	0.3	0.31	0.3	0.33
Nitrite as N	mg/L	<0.01	0.01	0.02	0.02	0.02
Metals						
Arsenic	µg/L	<10	<10	<10	40	<10
Cadmium	µg/L	0.6	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1	<1
Copper	µg/L	<1	<1	<1	1	2
Lead	µg/L	<1	<1	<1	1	<1
Mercury	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	µg/L	3	1	1	2	2
Silver	µg/L	<1	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	<10	<10
PCB Single Congeners						
PCB 8	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 18	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 28	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 44	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 52	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 66	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 77	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 101	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 105	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 118	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 126	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 128	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 138	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 153	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 169	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 170	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 180	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 187	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18

Summary Report

Date of Issue: 23/04/2015
 Client: Civil Engineering and Development Department
 Service Order No.: GE/2014/21.01
 Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1506978001	HK1506978002	HK1506978003	HK1506978004	HK1506978005	HK1506978006
Sampling Date	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015	25/02/2015
Client Sample ID	SD6 0M-0.9M	SD6 0.9M-1.9M	SD6 1.9M-2.9M	SD6 2.9M-3.9M	SD6 5.9M-6.9M	SD6 ELUTRIATE BLK
Units						
Organochlorine Pesticides (OC)						
alpha-BHC	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Phenanthrene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Anthracene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Pyrene	µg/L	<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
Chrysene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<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
Dibenz(a,h)anthracene	µg/L	<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
Low M.W. PAHs	µg/L	<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

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1507221001	HK1507221002	HK1507221003	HK1507221004	HK1507221005
Sampling Date	27/02/2015	27/02/2015	27/02/2015	27/02/2015	27/02/2015
Client Sample ID	SD7	SD7	SD7	SD7	SD7
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M	ELUTRIATE BLK
Inorganic Nonmetallic Parameters					
Ammonia as N	mg/L	0.41	0.46	0.45	0.19
Reactive Phosphorus as P	µg/L	50	60	60	50
Total Kjeldahl Nitrogen as N	mg/L	0.7	0.9	0.9	0.6
Total Phosphorus as P	mg/L	0.06	0.07	0.06	0.06
Nitrate as N	mg/L	0.36	0.37	0.37	0.37
Nitrite as N	mg/L	0.01	0.01	0.01	0.01
Metals					
Arsenic	µg/L	<10	<10	<10	<10
Cadmium	µg/L	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1
Copper	µg/L	4	4	<1	2
Lead	µg/L	<1	<1	<1	<1
Mercury	µg/L	<0.5	<0.5	<0.5	<0.5
Nickel	µg/L	1	1	2	1
Silver	µg/L	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	<10
PCB Single Congeners					
PCB 8	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 18	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 28	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 44	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 52	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 66	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 77	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 101	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 105	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 118	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 126	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 128	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 138	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 153	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 169	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 170	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 180	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 187	µg/L	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	µg/L	<0.18	<0.18	<0.18	<0.18

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1507221001	HK1507221002	HK1507221003	HK1507221004	HK1507221005
Sampling Date	27/02/2015	27/02/2015	27/02/2015	27/02/2015	27/02/2015
Client Sample ID	SD7	SD7	SD7	SD7	SD7
Units	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M	ELLUTRIATE BLK
Organochlorine Pesticides (OC)					
alpha-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	<0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthene	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	<0.2	<0.2	<0.2	<0.2	<0.2
Phenanthrene	<0.2	<0.2	<0.2	<0.2	<0.2
Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Benz(a)anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-cd)pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(g,h,i)perylene	<0.2	<0.2	<0.2	<0.2	<0.2
Low M.W. PAHs	<2.2	<2.2	<2.2	<2.2	<2.2
High M.W. PAHs	<6.8	<6.8	<6.8	<6.8	<6.8

Summary Report

Date of Issue: 23/07/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1507060001	HK1507060002	HK1507060003	HK1507060004	HK1507060005
Sampling Date	26/02/2015	26/02/2015	26/02/2015	26/02/2015	26/02/2015
Client Sample ID	SD8 0M-0.9M	SD8 0.9M-1.9M	SD8 1.9M-2.9M	SD8 2.9M-3.9M	SD8 ELUTRIATE BLK
Units					
Inorganic Nonmetallic Parameters					
Ammonia as N	mg/L	0.53	0.71	0.34	0.26
Reactive Phosphorus as P	µg/L	10	20	<10	40
Total Kjeldahl Nitrogen as N	mg/L	1	1.1	0.6	0.5
Total Phosphorus as P	mg/L	0.04	0.04	0.03	<0.01
Nitrate as N	mg/L	0.17	0.13	0.32	0.4
Nitrite as N	mg/L	0.03	0.03	0.1	0.02
Metals					
Arsenic	µg/L	<10	<10	<10	<10
Cadmium	µg/L	<0.2	<0.2	<0.2	<0.2
Chromium	µg/L	<1	<1	<1	<1
Copper	µg/L	3	4	4	5
Lead	µg/L	<1	<1	<1	<1
Mercury	µg/L	<0.5	<0.5	<0.5	<0.5
Nickel	µg/L	1	2	2	1
Silver	µg/L	<1	<1	<1	<1
Zinc	µg/L	<10	<10	<10	<10
PCB Single Congeners					
PCB 8	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 18	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 28	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 44	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 52	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 66	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 77	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 101	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 105	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 118	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 126	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 128	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 138	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 153	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 169	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 170	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 180	µg/L	<0.01	<0.01	<0.01	<0.01
PCB 187	µg/L	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	µg/L	<0.18	<0.18	<0.18	<0.18

Summary Report

Date of Issue: 23/07/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1507060001	HK1507060002	HK1507060003	HK1507060004	HK1507060005
Sampling Date	26/02/2015	26/02/2015	26/02/2015	26/02/2015	26/02/2015
Client Sample ID	SD8 0M-0.9M	SD8 0.9M-1.9M	SD8 1.9M-2.9M	SD8 2.9M-3.9M	SD8 ELUTRIATE BLK
Units					
Organochlorine Pesticides (OC)					
alpha-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	<0.1	<0.1	<0.1	<0.1	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthene	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	<0.2	<0.2	<0.2	<0.2	<0.2
Phenanthrene	<0.2	<0.2	<0.2	<0.2	<0.2
Anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Benz(a)anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Indeno(1,2,3-cd)pyrene	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz(a,h)anthracene	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(g,h,i)perylene	<0.2	<0.2	<0.2	<0.2	<0.2
Low M.W. PAHs	<2.2	<2.2	<2.2	<2.2	<2.2
High M.W. PAHs	<6.8	<6.8	<6.8	<6.8	<6.8

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1509809001	HK1509809002
Sampling Date	20/03/2015	20/03/2015
Client Sample ID	RGS1	RGS1 ELUTRIATE BLK
Units		
Inorganic Nonmetallic Parameters		
Ammonia as N	1.1	0.05
Reactive Phosphorus as P	10	<10
Total Kjeldahl Nitrogen as N	1.8	0.2
Total Phosphorus as P	0.16	<0.01
Nitrate as N	0.01	0.03
Nitrite as N	<0.01	<0.01
Metals		
Arsenic	<10	<10
Cadmium	<0.2	<0.2
Chromium	<1	<1
Copper	<1	<1
Lead	<1	<1
Mercury	<0.5	<0.5
Nickel	<1	<1
Silver	<1	<1
Zinc	<10	<10
PCB Single Congeners		
PCB 8	<0.01	<0.01
PCB 18	<0.01	<0.01
PCB 28	<0.01	<0.01
PCB 44	<0.01	<0.01
PCB 52	<0.01	<0.01
PCB 66	<0.01	<0.01
PCB 77	<0.01	<0.01
PCB 101	<0.01	<0.01
PCB 105	<0.01	<0.01
PCB 118	<0.01	<0.01
PCB 126	<0.01	<0.01
PCB 128	<0.01	<0.01
PCB 138	<0.01	<0.01
PCB 153	<0.01	<0.01
PCB 169	<0.01	<0.01
PCB 170	<0.01	<0.01
PCB 180	<0.01	<0.01
PCB 187	<0.01	<0.01
Total Polychlorinated biphenyls	<0.18	<0.18

Summary Report

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	HK1509809001	HK1509809002
Sampling Date	20/03/2015	20/03/2015
Client Sample ID	RGS1	RGS1
Units		ELUTRIATE BLK
Organochlorine Pesticides (OC)		
alpha-BHC	µg/L	<0.1
beta-BHC	µg/L	<0.1
gamma-BHC	µg/L	<0.1
delta-BHC	µg/L	<0.1
Heptachlor	µg/L	<0.1
Aldrin	µg/L	<0.1
Heptachlor epoxide	µg/L	<0.1
Endosulfan 1	µg/L	<0.1
4,4'-DDE	µg/L	<0.1
4,4'-DDD	µg/L	<0.1
Endosulfan sulfate	µg/L	<0.1
4,4'-DDT	µg/L	<0.1
Polycyclic Aromatic Hydrocarbons (PAHs)		
Naphthalene	µg/L	<0.2
Acenaphthylene	µg/L	<0.2
Acenaphthene	µg/L	<0.2
Fluorene	µg/L	<0.2
Phenanthrene	µg/L	<0.2
Anthracene	µg/L	<0.2
Fluoranthene	µg/L	<0.2
Pyrene	µg/L	<0.2
Benz(a)anthracene	µg/L	<0.2
Chrysene	µg/L	<0.2
Benzo(b)fluoranthene	µg/L	<0.2
Benzo(k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.2
Indeno(1,2,3-cd)pyrene	µg/L	<0.2
Dibenz(a,h)anthracene	µg/L	<0.2
Benzo(g,h,i)perylene	µg/L	<0.2
Low M.W. PAHs	µg/L	<2.2
High M.W. PAHs	µg/L	<6.8

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Sediment Quality Report
Project: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order No.: CONTRACT NO. GE/2014/21.01

ALS Lab ID	Sample ID	Sampling Date	Analyte Description													Classification			
			Unit (in dry Wt basis)	Silver mg/kg	Arsenic mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Nickel mg/kg	Lead mg/kg	Zinc mg/kg	Mercury mg/kg	Polychlorinated biphenyls µg/kg	Low M.W. PAHs µg/kg	High M.W. PAHs µg/kg		Tributyl Tin ug TBT/L		
			Reporting Limits	0.1	1	0.2	1	1	1	1	1	1	1	1	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	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																			
			Sample ID																
HK1504825001	GB1	02/02/2015		0.8	8	0.2	36	38	22	49	154	0.05	<18	<550	<1700	<0.015	L		
HK1504825002	GB2	02/02/2015		1.0	8	0.3	39	41	24	55	164	<0.05	<18	<550	<1700	<0.015	L		
HK1504825003	GB4	02/02/2015		0.9	8	0.2	37	39	23	54	167	<0.05	<18	<550	<1700	<0.015	L		
HK1504825004	GB5	02/02/2015		0.9	9	0.3	39	40	23	53	167	0.07	<18	<550	<1700	<0.015	L		

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.

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)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Sediment Quality Report
Project: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order No.: CONTRACT NO. GE/2014/21.01

ALS Lab ID	Sample ID	Analyte Description Unit (in dry Wt basis)	Silver mg/kg	Arsenic mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Nickel mg/kg	Lead mg/kg	Zinc mg/kg	Mercury mg/kg	Total Polychlorinated biphenyls µg/kg	Low M.W. PAHs µg/kg	High M.W. PAHs µg/kg	Tributyl Tin ug TBT/L	Classification
			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																
		Sampling Date														
		GB6	0.4	3	<0.2	11	18	5	16	64	<0.05	<18	<550	<1700	<0.015	L
		GB7	0.3	3	<0.2	8	13	4	12	47	<0.05	<18	<550	<1700	<0.015	L

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.

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)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Sediment Quality Report
Project: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order No.: CONTRACT NO. GE/2014/21.01
Drillhole: SD4

ALS Lab ID	Sample ID	Sampling Date	Analyte Description													Classification	
			Unit (In dry Wt basis)	Reporting Limits	Silver mg/kg	Arsenic mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Nickel mg/kg	Lead mg/kg	Zinc mg/kg	Mercury mg/kg	Polychlorinated biphenyls µg/kg	Low M.W. PAHs µg/kg		High M.W. PAHs µg/kg	Tributyl Tin ug TBT/L
					0.1	1	0.2	1	1	1	1	1	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																	
HK1505113001	SD4 0M-0.9M	06/02/2015			0.1	10	<0.2	26	10	15	39	77	<0.05	<18	<550	<1700	<0.015
HK1505113002	SD4 0.9M-1.9M	06/02/2015			0.1	10	<0.2	31	11	16	39	88	<0.05	<18	<550	<1700	<0.015
HK1505113003	SD4 1.9M-2.9M	06/02/2015			0.1	11	<0.2	35	10	20	36	98	<0.05	<18	<550	<1700	<0.015
HK1505113004	SD4 2.9M-3.9M	06/02/2015			0.1	9	<0.2	28	12	17	44	85	<0.05	<18	<550	<1700	<0.015

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.

- 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)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Sediment Quality Report
Project: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order No.: CONTRACT NO. GE/2014/21.01
Drillhole: SD5

ALS Lab ID	Sample ID	Sampling Date	Analyte Description											Classification			
			Unit (in dry wt basis)	Silver mg/kg	Arsenic mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Nickel mg/kg	Lead mg/kg	Zinc mg/kg	Mercury mg/kg	Total Polychlorinated biphenyls µg/kg		Low M.W. PAHs µg/kg	High M.W. PAHs µg/kg	Tributyl Tin ug TBT/L
			Reporting Limits	0.1	1	0.2	1	1	1	1	1	1	0.05	18	550	1700	0.015
			Lower Chemical Exceedance Level (LCEL)	1	12	1.5	80	40	75	200	0.5	23	550	1700	1700	0.15	
			Upper Chemical Exceedance Level (UCEL)	2	42	4	160	40	110	270	1	180	3160	9600	0.15		
			10 x (LCEL)	10	120	15	800	400	750	2000	5	230	5500	17000	1.5		
Sample Description																	
			<0.1	<1.10	<0.2	<1.27	<1.13	<1.15	<1.46	<1.95	<0.05	<18	<550	<1700	<0.015	L	
			0.2	<1.10	<0.2	<1.27	<1.13	<1.15	<1.46	<1.95	0.08	<18	<550	<1700	IS	L	
			<0.1	<1.7	<0.2	<1.24	<1.8	<1.15	<1.31	<1.75	<0.05	<18	<550	<1700	IS	L	
			<0.1	<1.9	<0.2	<1.30	<1.10	<1.18	<1.37	<1.84	<0.05	<18	<550	<1700	IS	L	
			<0.1	<1.10	<0.2	<1.23	<1.12	<1.14	<1.46	<1.80	<0.05	<18	<550	<1700	IS	L	

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)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Sediment Quality Report
Project: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order No.: CONTRACT NO. GE/2014/21.01
Drillhole: SD8

ALS Lab ID	Sample ID	Sampling Date	Analyte Description											Classification			
			Unit (in dry wt basis)	Silver mg/kg	Arsenic mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Nickel mg/kg	Lead mg/kg	Zinc mg/kg	Mercury mg/kg	Polychlorinated biphenyls µg/kg		Low M.W. PAHs µg/kg	High M.W. PAHs µg/kg	Tributyl Tin ug TBT/L
			Reporting Limits	0.1	1	0.2	1	1	1	1	1	1	18	550	1700	0.015	
			Lower Chemical Exceedance Level (UCEL)	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 (UCEL)	10	120	15	800	650	400	750	2000	5	230	5500	17000	1.5	
Sample Description																	
			Sample ID														
HK1507057001	SD8 0M-0.9M	26/02/2015	0.8	18	0.2	18	36	10	49	139	0.10	<18	<550	<1700	<0.015	M	
HK1507057002	SD8 0.9M-1.9M	26/02/2015	0.7	14	0.2	16	34	9	44	123	0.09	<18	<550	<1700	<0.015	M	
HK1507057003	SD8 1.9M-2.9M	26/02/2015	<0.1	7	<0.2	10	5	4	25	25	<0.05	<18	<550	<1700	<0.015	L	
HK1507057004	SD8 2.9M-3.9M	26/02/2015	<0.1	<1	<0.2	3	1	<1	1020	25	<0.05	<18	<550	<1700	<0.015	10xLCEL	

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.

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)

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Sediment Quality Report
Project: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order No.: CONTRACT NO. GE/2014/21.01
Drillhole: RGS1

Analyte Description Unit (in dry wt basis)	Silver	Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Mercury	Total Polychlorinated biphenyls	Low M.W. PAHs	High M.W. PAHs	Tributyl Tin	Classification
	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 (UCEL)	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
HK1509806001	RGS1
	Sampling Date
	20/03/2015

Bold: Value that exceed LCEL

Bold Italic and Underlined: Value that exceed UCEL

Bold and Underlined: Value that exceed 10 x LCEL

Total PCBs: 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.

- 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)

Section 2

Certificate of Analysis

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 12
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1504765
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 1/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong	Amendment	: 1
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com	Date Samples Received	: 02-FEB-2015
Telephone	: ---	Telephone	: +852 2610 1044	Issue Date	: 16-APR-2015
Facsimile	: ---	Facsimile	: +852 2610 2021	No. of samples received	: 6
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	No. of samples analysed	: 6
Order number	: GE/2014/21.01				
C-O-C number	: H026580				
Site	: ---				

This report may not be reproduced except with prior written approval from the testing laboratory.
Hong Kong Accreditation Service (HKAS) has accredited 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

Chan Chi Wai, Chris
Chan Ka Yu, Karen
Tai Yuk Lun, Stephen
Wong Wing, Kenneth

Position

Chemist
Manager - Organics
Senior Chemist - Food
Manager - Metals

Authorised results for

Inorganics
Organics
Organics
Inorganics

ALS Laboratory Group
Trading Name: ALS Technichem (HK) Pty Ltd
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A Campbell Brothers Limited Company



Page Number : 2 of 12
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504765, Amendment 1

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: 18-FEB-2015

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: HK1504765

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction. Sample(s) were received in an ambient 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 D3974-09 based on ASTM D3974-09, prior to 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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time		Client sample ID	SD3				
			Unit	%		0M-0.9M [02-FEB-2015] HK1504765-001	0.9M-1.9M [02-FEB-2015] HK1504765-002	1.9M-2.9M [02-FEB-2015] HK1504765-003	2.9M-3.9M [02-FEB-2015] HK1504765-004	SD3 5.9M-6.9M [02-FEB-2015] HK1504765-005
EA/ED: Physical and Aggregate Properties										
EA055: Moisture Content (dried @ 103°C)	----	0.1	%			39.4	38.0	41.9		35.4
EG: Metals and Major Cations										
EG020: Arsenic	7440-38-2	1	mg/kg			7	10	7		12
EG020: Cadmium	7440-43-9	0.2	mg/kg			<0.2	<0.2	<0.2		<0.2
EG020: Chromium	7440-47-3	1	mg/kg			29	28	33		25
EG020: Copper	7440-50-8	1	mg/kg			9	8	10		13
EG020: Lead	7439-92-1	1	mg/kg			33	34	36		43
EG020: Mercury	7439-97-6	0.05	mg/kg			<0.05	<0.05	<0.05		<0.05
EG020: Nickel	7440-02-0	1	mg/kg			17	16	19		16
EG020: Silver	7440-22-4	0.1	mg/kg			0.1	0.1	0.1		0.2
EG020: Zinc	7440-66-6	1	mg/kg			90	86	99		80
EP-065: PCB Single Congeners										
PCB 8	34883-43-7	3	µg/kg			<3	<3	<3		<3
PCB 18	37680-65-2	3	µg/kg			<3	<3	<3		<3
PCB 28	7012-37-5	3	µg/kg			<3	<3	<3		<3
PCB 44	41464-39-5	3	µg/kg			<3	<3	<3		<3
PCB 52	35693-99-3	3	µg/kg			<3	<3	<3		<3
PCB 66	32598-10-0	3	µg/kg			<3	<3	<3		<3
PCB 77	32598-13-3	3	µg/kg			<3	<3	<3		<3
PCB 101	37680-73-2	3	µg/kg			<3	<3	<3		<3
PCB 105	32598-14-4	3	µg/kg			<3	<3	<3		<3
PCB 118	31508-00-6	3	µg/kg			<3	<3	<3		<3
PCB 126	57465-28-8	3	µg/kg			<3	<3	<3		<3
PCB 128	38380-07-3	3	µg/kg			<3	<3	<3		<3
PCB 138	35065-28-2	3	µg/kg			<3	<3	<3		<3
PCB 153	35065-27-1	3	µg/kg			<3	<3	<3		<3
PCB 169	32774-16-6	3	µg/kg			<3	<3	<3		<3
PCB 170	35065-30-6	3	µg/kg			<3	<3	<3		<3
PCB 180	35065-29-3	3	µg/kg			<3	<3	<3		<3
PCB 187	52663-68-0	3	µg/kg			<3	<3	<3		<3
Total Polychlorinated biphenyls	----	18	µg/kg			<18	<18	<18		<18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)										
Naphthalene	9120-3	50	µg/kg			<50	<50	<50		<50
Acenaphthylene	208-96-8	50	µg/kg			<50	<50	<50		<50
Acenaphthene	83-32-9	50	µg/kg			<50	<50	<50		<50
Fluorene	86-73-7	50	µg/kg			<50	<50	<50		<50
Phenanthrene	85-01-8	50	µg/kg			<50	<50	<50		<50



Sub-Matrix: SEDIMENT		Client sample ID		SD3				
Compound	CAS Number	LOR	Unit	0M-0.9M [02-FEB-2015] HK1504765-001	0.9M-1.9M [02-FEB-2015] HK1504765-002	1.9M-2.9M [02-FEB-2015] HK1504765-003	2.9M-3.9M [02-FEB-2015] HK1504765-004	SD3 5.9M-6.9M [02-FEB-2015] HK1504765-005
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
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
Chrysene	218-019	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								
2-Fluorobiphenyl	32160-8	0.1	%	99.1	92.3	88.3	83.3	95.6
4-Terphenyl-d14	1718-510	0.1	%	93.1	85.8	85.9	78.0	90.6
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								
Decachlorobiphenyl	205124-3	0.1	%	73.1	61.4	69.2	59.5	67.0



Compound	Client sample ID			SD3
	CAS Number	LOR	Unit	
EA/ED: Physical and Aggregate Properties				
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	33.6
EG: Metals and Major Cations				
EG020: Arsenic	7440-38-2	1	mg/kg	12
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2
EG020: Chromium	7440-47-3	1	mg/kg	30
EG020: Copper	7440-50-8	1	mg/kg	12
EG020: Lead	7439-92-1	1	mg/kg	37
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05
EG020: Nickel	7440-02-0	1	mg/kg	20
EG020: Silver	7440-22-4	0.1	mg/kg	0.2
EG020: Zinc	7440-66-6	1	mg/kg	75
EP-065: PCB Single Congeners				
PCB 8	34883-43-7	3	µg/kg	<3
PCB 18	37680-65-2	3	µg/kg	<3
PCB 28	7012-37-5	3	µg/kg	<3
PCB 44	41464-39-5	3	µg/kg	<3
PCB 52	35693-99-3	3	µg/kg	<3
PCB 66	32598-10-0	3	µg/kg	<3
PCB 77	32598-13-3	3	µg/kg	<3
PCB 101	37680-73-2	3	µg/kg	<3
PCB 105	32598-14-4	3	µg/kg	<3
PCB 118	31508-00-6	3	µg/kg	<3
PCB 126	57465-28-8	3	µg/kg	<3
PCB 128	38380-07-3	3	µg/kg	<3
PCB 138	35065-28-2	3	µg/kg	<3
PCB 153	35065-27-1	3	µg/kg	<3
PCB 169	32774-16-6	3	µg/kg	<3
PCB 170	35065-30-6	3	µg/kg	<3
PCB 180	35065-29-3	3	µg/kg	<3
PCB 187	52663-68-0	3	µg/kg	<3
Total Polychlorinated biphenyls	----	18	µg/kg	<18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)				
Naphthalene	9120-3	50	µg/kg	<50
Acenaphthylene	208-96-8	50	µg/kg	<50
Acenaphthene	83-32-9	50	µg/kg	<50
Fluorene	86-73-7	50	µg/kg	<50
Phenanthrene	85-01-8	50	µg/kg	<50
Anthracene	120-12-7	50	µg/kg	<50



Sub-Matrix: SEDIMENT		Client sample ID		SD3
Compound	CAS Number	LOR	Unit	8.9M-9.9M [02-FEB-2015] HK1504765-006
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued				
Fluoranthene	206-440-0	150	µg/kg	<150
Pyrene	129-00-0	150	µg/kg	<150
Benz(a)anthracene	56-55-3	150	µg/kg	<150
Chrysene	218-01-9	150	µg/kg	<150
Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150
Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150
Benzo(a)pyrene	50-32-8	150	µg/kg	<150
Indeno(1,2,3-cd)pyrene	193-39-5	150	µg/kg	<150
Dibenz(a,h)anthracene	53-70-3	150	µg/kg	<150
Benzo(g,h,i)perylene	191-24-2	150	µg/kg	<150
Low M.W. PAHs	----	550	µg/kg	<550
High M.W. PAHs	----	1700	µg/kg	<1700
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates				
2-Fluorobiphenyl	32160-8	0.1	%	97.8
4-Terphenyl-d14	1718-510	0.1	%	90.7
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate				
Decachlorobiphenyl	205124-3	0.1	%	58.9

Surrogate control limits listed at end of this report.

Surrogate control limits listed at end of this report.



Page Number : 7 of 12
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504765, Amendment 1

Sub-Matrix: INTERSTITIAL WATER		Client sample ID					
Compound	CAS Number	LOR	Client sampling date / time				
		Unit					
EP-390: Triorganotins Tributyltin	56573-85-4	0.015	SD3 0M-0.9M [02-FEB-2015]	SD3 0.9M-1.9M [02-FEB-2015]	SD3 1.9M-2.9M [02-FEB-2015]	SD3 2.9M-3.9M [02-FEB-2015]	SD3 5.9M-6.9M [02-FEB-2015]
			HK1504765-001	HK1504765-002	HK1504765-003	HK1504765-004	HK1504765-005
			<0.015	<0.015	<0.015	<0.015	<0.015
			µg TBT /L				



Page Number : 8 of 12
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504765, Amendment 1

Sub-Matrix: INTERSTITIAL WATER		Client sample ID	Client sampling date / time	LOR	Unit
		SD3	8.9M-9.9M		
			[02-FEB-2015]		
			HK1504765-006		
Compound	CAS Number	LOR	Unit	µg TBT /L	
EP-390: Triorganotins	56573-85-4	0.015		<0.015	
Tributyltin					



Laboratory Duplicate (DUP) Report

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOD	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 3819002)									
HK1504765-001	SD3 0M-0.9M	EA055: Moisture Content (dried @ 103°C)		----	0.1	%	47.1	47.7	1.3
HK1504950-001	Anonymous	EA055: Moisture Content (dried @ 103°C)		----	0.1	%	45.6	45.8	0.4
EG: Metals and Major Cations (QC Lot: 3819141)									
HK1504765-001	SD3 0M-0.9M	EG020: Mercury		7439-97-6	0.05	mg/kg	0.10	0.09	10.6
		EG020: Silver		7440-22-4	0.1	mg/kg	0.2	0.2	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	12	12	0.0
		EG020: Chromium		7440-47-3	1	mg/kg	27	25	5.7
		EG020: Copper		7440-50-8	1	mg/kg	15	16	7.8
		EG020: Lead		7439-92-1	1	mg/kg	53	55	3.9
		EG020: Nickel		7440-02-0	1	mg/kg	16	14	7.1
		EG020: Zinc		7440-66-6	1	mg/kg	97	93	4.1
HK1504825-004	Anonymous	EG020: Mercury		7439-97-6	0.05	mg/kg	0.07	0.08	18.1
		EG020: Silver		7440-22-4	0.1	mg/kg	0.9	1.0	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	9	8	0.0
		EG020: Chromium		7440-47-3	1	mg/kg	39	40	0.0
		EG020: Copper		7440-50-8	1	mg/kg	40	41	3.9
		EG020: Lead		7439-92-1	1	mg/kg	53	56	6.0
		EG020: Nickel		7440-02-0	1	mg/kg	23	24	0.0
		EG020: Zinc		7440-66-6	1	mg/kg	167	174	4.1
EP-065: PCB Single Congeners (QC Lot: 3817752)									
HK1504765-001	SD3 0M-0.9M	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659)									



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504765, Amendment 1

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
Matrix: SOIL									
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659) - Continued									
HK1504792-002	Anonymous		High M.W. PAHs		1700	µg/kg	<1700	<1700	0.0
			Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
			Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
			Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
			Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
			Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
			Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
			Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
			Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
			Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
			Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
			Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
			Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
			Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
			Indeno(1,2,3-cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
			Dibenz(a,h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
			Benzo(g,h,i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
			Low M.W. PAHs		550	µg/kg	<550	<550	0.0

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
Matrix: WATER									
EP-390: Triorganotins (QC Lot: 3821358)									
HK1504665-004	Anonymous		Tributyltin	56573-85-4	5	ngSn/L	<5	<5	0.0

Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report									
Matrix: SOIL									
Method: Compound									
EG: Metals and Major Cations (QC Lot: 3819141)									
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Control Limit
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	96.7		76	112
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	92.1		79	111
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	93.3		76	118
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	99.6		79	105
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	92.0		80	104
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	95.0		76	112
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	95.7		79	105
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	84.6		76	106
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	103		76	114

Method Blank (MB) Report									
Matrix: SOIL									
Method: Compound									
EP-065: PCB Single Congeners (QC Lot: 3817752)									
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Control Limit
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	93.4		41	126
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	92.2		36	118
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	97.4		35	119
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	98.6		26	124
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	99.6		26	124



Method: Compound		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
		CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	Control Limit
EP-065: PCB Single Congeners (QC Lot: 3817752) - Continued											
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	102	-----	24	125	-----	-----
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	102	-----	51	122	-----	-----
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	95.5	-----	46	122	-----	-----
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	99.3	-----	52	122	-----	-----
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	97.9	-----	50	123	-----	-----
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	103	-----	53	121	-----	-----
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	99.7	-----	54	124	-----	-----
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	97.3	-----	51	123	-----	-----
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	98.2	-----	51	124	-----	-----
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	101	-----	55	126	-----	-----
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	99.1	-----	58	124	-----	-----
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	99.4	-----	56	126	-----	-----
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	96.7	-----	51	123	-----	-----
Total Polychlorinated biphenyls											
	-----	18	µg/kg	<18	-----	-----	-----	-----	-----	-----	-----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659)											
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	97.4	-----	68	107	-----	-----
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	97.5	-----	70	113	-----	-----
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	96.4	-----	68	108	-----	-----
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	106	-----	71	111	-----	-----
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	107	-----	71	110	-----	-----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	103	-----	63	117	-----	-----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	108	-----	72	113	-----	-----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	111	-----	72	112	-----	-----
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	113	-----	70	119	-----	-----
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	111	-----	79	112	-----	-----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	114	-----	68	125	-----	-----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	104	-----	75	113	-----	-----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	114	-----	64	118	-----	-----
Indeno(1.2.3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	100	-----	61	127	-----	-----
Dibenzo(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	88.8	-----	66	112	-----	-----
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	111	-----	73	114	-----	-----
Low M.W. PAHs	-----	550	µg/kg	<550	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	1700	µg/kg	<1700	-----	-----	-----	-----	-----	-----	-----
Matrix: WATER											
Method Blank (MB) Report											
Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report											
Method Blank (MB) Report											
Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report											
Method: Compound											
EP-390: Triorganotins (QC Lot: 3821358)											
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	97.6	-----	70	130	-----	-----



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504765, Amendment 1

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	MS	MSD	Recovery Limits (%)	RPD (%)	
				Low	High	Value	Control Limit		
EG: Metals and Major Cations (QC Lot: 3819141)									
HK1504224-001 Anonymous		EG020: Arsenic	7440-38-2	5 mg/kg	106	-----	75	125	-----
		EG020: Cadmium	7440-43-9	5 mg/kg	103	-----	75	125	-----
		EG020: Chromium	7440-47-3	5 mg/kg	101	-----	75	125	-----
		EG020: Copper	7440-50-8	5 mg/kg	97.1	-----	75	125	-----
		EG020: Lead	7439-92-1	5 mg/kg	86.8	-----	75	125	-----
		EG020: Mercury	7439-97-6	0.1 mg/kg	80.9	-----	75	125	-----
		EG020: Nickel	7440-02-0	5 mg/kg	98.3	-----	75	125	-----
		EG020: Silver	7440-22-4	5 mg/kg	90.1	-----	75	125	-----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	-----	75	125	-----

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
				Spike Concentration	MS	MSD	Recovery Limits (%)	RPD (%)	
				Low	High	Value	Control Limit		
EP-390: Triorganotins (QC Lot: 3821358)									
HK1504665-004 Anonymous		Tributyltin	56573-85-4	2 ngSn/L	96.8	-----	70	130	-----

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
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

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EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026584
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Quote number : HK/1393/2014

Page : 1 of 9
Work Order : HK1504825

Date Samples Received : 02-FEB-2015
Issue Date : 25-FEB-2015
No. of samples received : 4
No. of samples analysed : 4

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Hong Kong Accreditation Service (HKAS) has accredited 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

Chan Chi Wai, Chris
Chan Ka Yu, Karen
Tai Yuk Lun, Stephen

Chemist
Manager - Organics
Senior Chemist - Food

Authorised results for

Inorganics
Organics
Organics



Page Number : 2 of 9
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504825

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: 18-FEB-2015

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: **HK1504825**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.
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 D3974-09 based on ASTM D3974-09, prior to 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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		GB1	GB2	GB4	GB5
			Client sampling date / time	Unit				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	53.1	59.9	61.4	54.2	
EG: Metals and Major Cations								
EG020: Arsenic	7440-38-2	1	mg/kg	8	8	8	9	
EG020: Cadmium	7440-43-9	0.2	mg/kg	0.2	0.3	0.2	0.3	
EG020: Chromium	7440-47-3	1	mg/kg	36	39	37	39	
EG020: Copper	7440-50-8	1	mg/kg	38	41	39	40	
EG020: Lead	7439-92-1	1	mg/kg	49	55	54	53	
EG020: Mercury	7439-97-6	0.05	mg/kg	0.05	<0.05	<0.05	0.07	
EG020: Nickel	7440-02-0	1	mg/kg	22	24	23	23	
EG020: Silver	7440-22-4	0.1	mg/kg	0.8	1.0	0.9	0.9	
EG020: Zinc	7440-66-6	1	mg/kg	154	164	167	167	
EP-065: PCB Single Congeners								
PCB 8	34883-43-7	3	µg/kg	<3	<3	<3	<3	
PCB 18	37680-65-2	3	µg/kg	<3	<3	<3	<3	
PCB 28	7012-37-5	3	µg/kg	<3	<3	<3	<3	
PCB 44	41464-39-5	3	µg/kg	<3	<3	<3	<3	
PCB 52	35693-99-3	3	µg/kg	<3	<3	<3	<3	
PCB 66	32598-10-0	3	µg/kg	<3	<3	<3	<3	
PCB 77	32598-13-3	3	µg/kg	<3	<3	<3	<3	
PCB 101	37680-73-2	3	µg/kg	<3	<3	<3	<3	
PCB 105	32598-14-4	3	µg/kg	<3	<3	<3	<3	
PCB 118	31508-00-6	3	µg/kg	<3	<3	<3	<3	
PCB 126	57465-28-8	3	µg/kg	<3	<3	<3	<3	
PCB 128	38380-07-3	3	µg/kg	<3	<3	<3	<3	
PCB 138	35065-28-2	3	µg/kg	<3	<3	<3	<3	
PCB 153	35065-27-1	3	µg/kg	<3	<3	<3	<3	
PCB 169	32774-16-6	3	µg/kg	<3	<3	<3	<3	
PCB 170	35065-30-6	3	µg/kg	<3	<3	<3	<3	
PCB 180	35065-29-3	3	µg/kg	<3	<3	<3	<3	
PCB 187	52663-68-0	3	µg/kg	<3	<3	<3	<3	
Total Polychlorinated biphenyls	----	18	µg/kg	<18	<18	<18	<18	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	9120-3	50	µg/kg	<50	<50	<50	<50	
Acenaphthylene	208-96-8	50	µg/kg	<50	<50	<50	<50	
Acenaphthene	83-32-9	50	µg/kg	<50	<50	<50	<50	
Fluorene	86-73-7	50	µg/kg	<50	<50	<50	<50	
Phenanthrene	85-01-8	50	µg/kg	<50	<50	<50	<50	
Anthracene	120-12-7	50	µg/kg	<50	<50	<50	<50	



Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Unit	Client sample ID				
				Client sampling date / time	GB1	GB2	GB4	GB5
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
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
Chrysene	218-019	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								
2-Fluorobiphenyl	32160-8	0.1	%	95.0	90.5	88.1	95.5	Surrogate control limits listed at end of this report.
4-Terphenyl-d14	1718-510	0.1	%	88.2	83.9	79.4	90.3	Surrogate control limits listed at end of this report.
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								
Decachlorobiphenyl	205124-3	0.1	%	63.4	56.8	61.6	67.0	Surrogate control limits listed at end of this report.



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3819002)								
HK1504765-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	47.1	47.7	1.3
HK1504950-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	45.6	45.8	0.4
EG: Metals and Major Cations (QC Lot: 3819141)								
HK1504765-001	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.10	0.09	10.6
		EG020: Silver	7440-22-4	0.1	mg/kg	0.2	0.2	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	12	12	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	27	25	5.7
		EG020: Copper	7440-50-8	1	mg/kg	15	16	7.8
		EG020: Lead	7439-92-1	1	mg/kg	53	55	3.9
		EG020: Nickel	7440-02-0	1	mg/kg	16	14	7.1
		EG020: Zinc	7440-66-6	1	mg/kg	97	93	4.1
HK1504825-004	GB5	EG020: Mercury	7439-97-6	0.05	mg/kg	0.07	0.08	18.1
		EG020: Silver	7440-22-4	0.1	mg/kg	0.9	1.0	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	9	8	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	39	40	0.0
		EG020: Copper	7440-50-8	1	mg/kg	40	41	3.9
		EG020: Lead	7439-92-1	1	mg/kg	53	56	6.0
		EG020: Nickel	7440-02-0	1	mg/kg	23	24	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	167	174	4.1
EP-065: PCB Single Congeners (QC Lot: 3817752)								
HK1504765-001	Anonymous	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659)								



Matrix: SOIL		Laboratory Duplicate (DUP) Report		RPD (%)				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Unit	LOR	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659) - Continued								
High M.W. PAHs								
HK1504792-002	Anonymous	Naphthalene	91-20-3	µg/kg	1700	<1700	<1700	0.0
		Acenaphthylene	208-96-8	µg/kg	500	<500	<500	0.0
		Acenaphthene	83-32-9	µg/kg	500	<500	<500	0.0
		Fluorene	86-73-7	µg/kg	500	<500	<500	0.0
		Phenanthrene	85-01-8	µg/kg	500	<500	<500	0.0
		Anthracene	120-12-7	µg/kg	500	<500	<500	0.0
		Fluoranthene	206-44-0	µg/kg	500	<500	<500	0.0
		Pyrene	129-00-0	µg/kg	500	<500	<500	0.0
		Benz(a)anthracene	56-55-3	µg/kg	500	<500	<500	0.0
		Chrysene	218-01-9	µg/kg	500	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	µg/kg	500	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	µg/kg	500	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	µg/kg	500	<500	<500	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	500	<500	<500	0.0
		Dibenz(a,h)anthracene	53-70-3	µg/kg	500	<500	<500	0.0
		Benzo(g,h,i)perylene	191-24-2	µg/kg	500	<500	<500	0.0
		Low M.W. PAHs	-----	µg/kg	550	<550	<550	0.0

Matrix: WATER		Laboratory Duplicate (DUP) Report		RPD (%)				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Unit	LOR	Original Result	Duplicate Result	RPD (%)
EP-390: Triorganotins (QC Lot: 3821358)								
HK1504665-004	Anonymous	Tributyltin	56573-85-4	ngSn/L	5	<5	<5	0.0

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

Matrix: SOIL										
Method Blank (MB) Report										
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Control Limit	
					Low	High	Value			
EG: Metals and Major Cations (QC Lot: 3819141)										
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	96.7	-----	76	112	-----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	92.1	-----	79	111	-----
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	93.3	-----	76	118	-----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	99.6	-----	79	105	-----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	92.0	-----	80	104	-----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	95.0	-----	76	112	-----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	95.7	-----	79	105	-----
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	84.6	-----	76	106	-----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	103	-----	76	114	-----
EP-065: PCB Single Congeners (QC Lot: 3817752)										
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	93.4	-----	41	126	-----
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	92.2	-----	36	118	-----
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	97.4	-----	35	119	-----
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	98.6	-----	26	124	-----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	99.6	-----	26	124	-----



Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report									
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report									
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
Matrix: SOIL											
EP-065: PCB Single Congeners (QC Lot: 3817752) - Continued											
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	102	125	24	125		
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	102	122	51	122		
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	95.5	122	46	122		
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	99.3	122	52	122		
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	97.9	123	50	123		
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	103	121	53	121		
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	99.7	124	54	124		
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	97.3	123	51	123		
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	98.2	124	51	124		
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	101	126	55	126		
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	99.1	124	58	124		
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	99.4	126	56	126		
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	96.7	123	51	123		
Total Polychlorinated biphenyls											
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659)											
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	97.4	107	68	107		
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	97.5	113	70	113		
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	96.4	108	68	108		
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	106	111	71	111		
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	107	110	71	110		
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	103	117	63	117		
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	108	113	72	113		
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	111	112	72	112		
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	113	119	70	119		
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	111	112	79	112		
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	114	125	68	125		
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	104	113	75	113		
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	114	118	64	118		
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	100	127	61	127		
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	88.8	112	66	112		
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	111	114	73	114		
Low M.W. PAHs		550	µg/kg	<550							
High M.W. PAHs		1700	µg/kg	<1700							
Matrix: WATER											
EP-390: Triorganotins (QC Lot: 3821358)											
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	97.6	130	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	MS	MSD	Recovery Limits (%)	RPD (%)		
EG: Metals and Major Cations (QC Lot: 3819141)				MS	MSD	Low	High	Value	Control Limit	
HK1504224-001	Anonymous									
		EG020: Arsenic	7440-38-2	5 mg/kg	106		75	125		
		EG020: Cadmium	7440-43-9	5 mg/kg	103		75	125		
		EG020: Chromium	7440-47-3	5 mg/kg	101		75	125		
		EG020: Copper	7440-50-8	5 mg/kg	97.1		75	125		
		EG020: Lead	7439-92-1	5 mg/kg	86.8		75	125		
		EG020: Mercury	7439-97-6	0.1 mg/kg	80.9		75	125		
		EG020: Nickel	7440-02-0	5 mg/kg	98.3		75	125		
		EG020: Silver	7440-22-4	5 mg/kg	90.1		75	125		
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined		75	125		

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	MS	MSD	Recovery Limits (%)	RPD (%)		
EP-390: Triorganotins (QC Lot: 3821358)				MS	MSD	Low	High	Value	Control Limit	
HK1504665-004	Anonymous									
		Tributyltin	56573-85-4	2 ngSn/L	96.8		70	130		

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
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 6
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1504839
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 1/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com	Date Samples Received	: 02-FEB-2015
Telephone	: ----	Telephone	: +852 2610 1044	Issue Date	: 25-FEB-2015
Facsimile	: ----	Facsimile	: +852 2610 2021	No. of samples received	: 6
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	No. of samples analysed	: 6
Order number	: GE/2014/21.01				
C-O-C number	: H026581				
Site	: ----				

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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

Chan Ka Yu, Karen
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Position

Manager - Organics
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Authorised results for

Organics
Inorganics

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Page Number : 2 of 6
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504839

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: 18-FEB-2015

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: **HK1504839**

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

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time		Client sample ID					
			Unit	%	SD3 0M-0.9M [02-FEB-2015] HK1504839-001	SD3 0.9M-1.9M [02-FEB-2015] HK1504839-002	SD3 1.9M-2.9M [02-FEB-2015] HK1504839-003	SD3 2.9M-3.9M [02-FEB-2015] HK1504839-004	SD3 5.9M-6.9M [02-FEB-2015] HK1504839-005	
EA/ED: Physical and Aggregate Properties										
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	47.1	39.4	38.0	41.9	35.4		
ED/EK: Inorganic Nonmetallic Parameters										
EK055: Ammonia as N	7664-41-7	0.1	mg/kg	12.6	6.0	4.5	7.0	4.7		
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1		
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1		
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	1190	956	893	882	517		
EK067A: Total Phosphorus as P	----	1	mg/kg	558	482	392	448	378		
EP-067_SR-A: Organochlorine Pesticides (OC)										
alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
gamma-BHC	58-59-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
Endosulfan sulfate	103107-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50		
EP-067_SR-S: Pesticide Surrogate										
Tetrachlorometaxylene	877-09-8	0.1	%	72.0	73.0	72.8	66.8	76.2		
Dibutylchloroendate	1770-80-5	0.1	%	75.8	69.2	69.0	59.6	70.6		

Surrogate control limits listed at end of this report.



Sub-Matrix: SEDIMENT		Client sample ID	
		SD3	
		8.9M-9.9M	
		[02-FEB-2015]	
		HK1504839-006	
Compound	CAS Number	LOR	Unit
EAI/ED: Physical and Aggregate Properties			
EA055: Moisture Content (dried @ 103° C)	----	0.1	%
			33.6
ED/EK: Inorganic Nonmetallic Parameters			
EK055: Ammonia as N	7664-417	0.1	mg/kg
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg
EK067A: Total Phosphorus as P	----	1	mg/kg
EP-067_SR-A: Organochlorine Pesticides (OC)			
alpha-BHC	319-84-6	0.50	mg/kg
beta-BHC	319-85-7	0.50	mg/kg
gamma-BHC	58-89-9	0.50	mg/kg
delta-BHC	319-86-8	0.50	mg/kg
Heptachlor	76-44-8	0.50	mg/kg
Aldrin	309-00-2	0.50	mg/kg
Heptachlor epoxide	1024-57-3	0.50	mg/kg
Endosulfan 1	959-98-8	0.50	mg/kg
4,4'-DDE	72-55-9	0.50	mg/kg
4,4'-DDD	72-54-8	0.50	mg/kg
Endosulfan sulfate	103107-8	0.50	mg/kg
4,4'-DDT	50-29-3	0.50	mg/kg
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	0.1	%
Dibutylchloroendate	1770-80-5	0.1	%
		66.8	
		56.4	
Surrogate control limits listed at end of this report.			



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: 3818994)								
HK1504839-001	SD3 0M-0.9M	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	47.1	47.7	1.3
HK1504951-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	45.6	45.8	0.4
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)								
HK1504844-001	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	1510	1470	3.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)								
HK1504839-001	SD3 0M-0.9M	EK067A: Total Phosphorus as P	----	1	mg/kg	558	520	7.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825432)								
HK1504161-001	Anonymous	EK055: Ammonia as N	7664-41-7	10	mg/kg	<10	<10	0.0
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3817759)								
HK1504839-001	SD3 0M-0.9M	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	0.0
		beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	0.0
		gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	0.0
		delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	0.0
		Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	0.0
		4.4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	0.0
		4.4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	0.0
		4.4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	0.0

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	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3818998)													
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	2 mg/kg	107	85	115	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)													
EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	104	85	115	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)													
EK067A: Total Phosphorus as P	----	20	mg/kg	<20	695 mg/kg	90.9	85	115	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825432)													
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	98.2	89	113	89	113	-----	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3817759)													
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	78.8	55	106	55	106	-----	-----	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	76.6	37	123	37	123	-----	-----	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	78.2	43	112	43	112	-----	-----	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	80.0	64	113	64	113	-----	-----	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	83.8	42	113	42	113	-----	-----	-----



Matrix: SOIL

Method Blank (MB) Report

Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Method: Compound

EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3817759) - Continued

Method Blank (MB) Report

Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration		Spike Recovery (%)		Recovery Limits (%)		Value	RPD (%)	Control Limit
					LCS	DCS	Low	High					
Aldrin	309-00-2	0.05	mg/kg	<0.05	89.2	-----	57	106	-----	-----	-----	-----	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	76.4	-----	61	108	-----	-----	-----	-----	
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	74.2	-----	55	120	-----	-----	-----	-----	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	78.2	-----	60	116	-----	-----	-----	-----	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	70.6	-----	52	127	-----	-----	-----	-----	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	72.6	-----	56	120	-----	-----	-----	-----	
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	75.8	-----	45	126	-----	-----	-----	-----	

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

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

Surrogate Control Limits

Sub-Matrix: SEDIMENT

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130



CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 4
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1504844
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		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 02-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 25-FEB-2015
C-O-C number	: H026576			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

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: 18-FEB-2015

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: **HK1504844**

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

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.

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics



Analytical Results

Compound	CAS Number	LOR	Client sample ID		GB1	GB2	GB4	GB5
			Client sampling date / time	Unit				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	53.1	59.9	61.4	54.2	[02-FEB-2015] HK1504844-004
ED/EK: Inorganic Nonmetallic Parameters								
EK055: Ammonia as N	7664-41-7	0.1	mg/kg	8.7	14.3	9.8	8.8	[02-FEB-2015] HK1504844-003
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	1510	1510	1670	1700	
EK067A: Total Phosphorus as P	----	1	mg/kg	505	491	532	560	
EP-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
gamma-BHC	58-88-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
EP-067_SR-S: Pesticide Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	68.6	61.0	66.8	76.4	Surrogate control limits listed at end of this report.
Dibutylchlorendate	1770-80-5	0.1	%	65.2	52.8	57.0	70.8	



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Laboratory Duplicate (DUP) Report				RPD (%)
					Original Result	Duplicate Result	Unit	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3818994)									
HK1504839-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	47.1	47.7	%	47.7	1.3
HK1504951-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	45.6	45.8	%	45.8	0.4
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)									
HK1504844-001	GB1	EK061A: Total Kjeldahl Nitrogen as N	----	1	1510	1470	mg/kg	1470	3.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)									
HK1504839-001	Anonymous	EK067A: Total Phosphorus as P	----	1	558	520	mg/kg	520	7.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825432)									
HK1504161-001	Anonymous	EK055: Ammonia as N	7664-41-7	10	<10	<10	mg/kg	<10	0.0
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3817759)									
HK1504839-001	Anonymous	alpha-BHC	319-84-6	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		beta-BHC	319-85-7	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		gamma-BHC	58-89-9	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		delta-BHC	319-86-8	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		Heptachlor	76-44-8	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		Aldrin	309-00-2	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		Heptachlor epoxide	1024-57-3	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		Endosulfan 1	959-98-8	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		4,4'-DDE	72-55-9	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		4,4'-DDD	72-54-8	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		Endosulfan sulfate	1031-07-8	0.50	<0.50	<0.50	mg/kg	<0.50	0.0
		4,4'-DDT	50-29-3	0.50	<0.50	<0.50	mg/kg	<0.50	0.0

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

Method: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report			
					Spike Concentration	Spike Recovery (%)	DCS	Recovery Limits (%)	Recovery Limits (%)	Value	Control Limit	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3818998)												
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	2 mg/kg	107	85	115	85	115	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)												
EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	104	85	115	85	115	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)												
EK067A: Total Phosphorus as P	----	20	mg/kg	<20	695 mg/kg	90.9	85	115	85	115	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825432)												
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	98.2	89	113	89	113	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3817759)												
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	78.8	55	106	55	106	-----	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	76.6	37	123	37	123	-----	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	78.2	43	112	43	112	-----	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	80.0	64	113	64	113	-----	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	83.8	42	113	42	113	-----	-----



Matrix: SOIL
 Method: Compound
 Method Blank (MB) Report
 Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Method: Compound	CAS Number	LOR	Unit	Result	Spike Recovery (%)			Recovery Limits (%)			RPD (%)
					Concentration	LCS	DCS	Low	High	Value		Control Limit
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3817759) - Continued											
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	89.2	-----	57	106	-----	-----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	76.4	-----	61	108	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	74.2	-----	55	120	-----	-----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	78.2	-----	60	116	-----	-----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	70.6	-----	52	127	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	72.6	-----	56	120	-----	-----
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	75.8	-----	45	126	-----	-----

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

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

Surrogate Control Limits

Sub-Matrix: SEDIMENT	Compound	CAS Number	Recovery Limits (%)	
			Low	High
EP-067_SR-S: Pesticide Surrogate				
	Tetrachlorometaxylene	877-09-8	50	130
	Dibutylchlorendate	1770-80-5	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 13
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1504948
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		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 02-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 25-FEB-2015
C-O-C number	: H026582-H026583			No. of samples received	: 7
Site	: ----			No. of samples analysed	: 7

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Signatories

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position
Manager - Organics
General Manager

Authorised results for

Organics
Inorganics

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Page Number : 2 of 13
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504948

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: 23-FEB-2015

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: **HK1504948**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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

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

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



Page Number : 3 of 13
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504948

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		Client sampling date / time	Unit	
			SD3	SD3			
EP-390: Triorganotins Tributyltin	56573-85-4	0.015	0M-0.9M	0.9M-1.9M	1.9M-2.9M	2.9M-3.9M	5.9M-6.9M
			[02-FEB-2015]	[02-FEB-2015]	[02-FEB-2015]	[02-FEB-2015]	[02-FEB-2015]
			HK1504948-001	HK1504948-002	HK1504948-003	HK1504948-004	HK1504948-005
			<0.015	<0.015	<0.015	<0.015	<0.015
			µg TBT / L	µg TBT / L	µg TBT / L	µg TBT / L	µg TBT / L



Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		Unit	µg TBT / L
			Client sampling date / time	Client sample ID		
EP-390: Triorganotins Tributyltin	56573-85-4	0.015	SD3 8.9M-9.9M [02-FEB-2015]	SD3 ELUTRIATE BLK [02-FEB-2015]	HK1504948-006	<0.015
			HK1504948-006	HK1504948-007		



Compound	CAS Number	Client sample ID		SD3 0M-0.9M [02-FEB-2015] HK1504948-001	SD3 0.9M-1.9M [02-FEB-2015] HK1504948-002	SD3 1.9M-2.9M [02-FEB-2015] HK1504948-003	SD3 2.9M-3.9M [02-FEB-2015] HK1504948-004	SD3 5.9M-6.9M [02-FEB-2015] HK1504948-005
		LOR	Unit					
ED/EK: Inorganic Nonmetallic Parameters								
EK055K: Ammonia as N	7664-417	0.01	mg/L	0.89	0.47	0.51	0.52	0.71
EK057A: Nitrite as N	---	0.01	mg/L	0.04	0.01	<0.01	<0.01	0.01
EK058A: Nitrate as N	14797-55-8	0.01	mg/L	0.07	0.05	0.08	0.10	0.06
EK061P: Total Kjeldahl Nitrogen as N	---	0.1	mg/L	1.3	1.1	0.9	1.0	1.5
EK067P: Total Phosphorus as P	---	0.01	mg/L	0.20	0.18	0.15	0.10	0.07
EK071K: Reactive Phosphorus as P	14265-44-2	10	µg/L	170	150	110	100	40
EG: Metals and Major Cations - Filtered								
EG020: Arsenic	7440-38-2	10	µg/L	20	<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	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EG020: Nickel	7440-02-0	1	µg/L	<1	1	<1	<1	1
EG020: Silver	7440-22-4	1	µg/L	1	<1	<1	<1	<1
EG020: Zinc	7440-66-6	10	µg/L	<10	<10	<10	22	<10
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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	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
PCB 153	35065-27-1	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 180	35065-29-3	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
Total Polychlorinated biphenyls	---	0.18	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18
EP-076HK: Polycyclic Aromatic 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



Compound	CAS Number	LOR	Unit	Client sample ID				
				SD3 0M-0.9M [02-FEB-2015] HK1504948-001	SD3 0.9M-1.9M [02-FEB-2015] HK1504948-002	SD3 1.9M-2.9M [02-FEB-2015] HK1504948-003	SD3 2.9M-3.9M [02-FEB-2015] HK1504948-004	SD3 5.9M-6.9M [02-FEB-2015] HK1504948-005
Sub-Matrix: ELUTRIATE								
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
Acenaphthene	83-329	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)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
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-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	103107-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.	
2-Fluorobiphenyl	32160-8	0.1	%	127	58.8	54.8	64.0	62.9
4-Terphenyl-d14	1718-510	0.1	%	114	118	105	111	110
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate							Surrogate control limits listed at end of this report.	
Decachlorobiphenyl	2051-24-3	0.1	%	69.4	69.7	65.3	57.6	62.6
EP-067_SR-S: Pesticide Surrogate							Surrogate control limits listed at end of this report.	
Tetrachlorometaxylene	877-09-8	0.1	%	54.2	54.2	51.4	50.8	52.4
Dibutylchlorendate	1770-80-5	0.1	%	81.8	76.8	81.0	63.0	80.0



Compound	Client sample ID		LOR	Unit	SD3 8.9M-9.9M [02-FEB-2015] HK1504948-006	SD3 ELUTRIATE BLK [02-FEB-2015] HK1504948-007
	CAS Number	Client sampling date / time				
Sub-Matrix: ELUTRIATE						
ED/EK: Inorganic Nonmetallic Parameters						
EK055K: Ammonia as N	7664-417		0.01	mg/L	0.31	0.02
EK057A: Nitrite as N	---		0.01	mg/L	0.03	<0.01
EK058A: Nitrate as N	14797-55-8		0.01	mg/L	0.07	0.05
EK061P: Total Kjeldahl Nitrogen as N	---		0.1	mg/L	0.7	0.3
EK067P: Total Phosphorus as P	---		0.01	mg/L	0.08	<0.01
EK071K: Reactive Phosphorus as P	14285-44-2		10	µg/L	40	<10
EG: Metals and Major Cations - Filtered						
EG020: Arsenic	7440-38-2		10	µg/L	<10	<10
EG020: Cadmium	7440-43-9		0.2	µg/L	<0.2	<0.2
EG020: Chromium	7440-47-3		1	µg/L	<1	<1
EG020: Copper	7440-50-8		1	µg/L	1	2
EG020: Lead	7439-92-1		1	µg/L	<1	<1
EG020: Mercury	7439-97-6		0.5	µg/L	<0.5	<0.5
EG020: Nickel	7440-02-0		1	µg/L	1	1
EG020: Silver	7440-22-4		1	µg/L	<1	<1
EG020: Zinc	7440-66-6		10	µg/L	<10	13
EP-065A: PCB Single Congeners						
PCB 8	34883-43-7		0.01	µg/L	<0.01	<0.01
PCB 18	37680-65-2		0.01	µg/L	<0.01	<0.01
PCB 28	7012-37-5		0.01	µg/L	<0.01	<0.01
PCB 44	41464-39-5		0.01	µg/L	<0.01	<0.01
PCB 52	35693-99-3		0.01	µg/L	<0.01	<0.01
PCB 66	32598-10-0		0.01	µg/L	<0.01	<0.01
PCB 77	32598-13-3		0.01	µg/L	<0.01	<0.01
PCB 101	37680-73-2		0.01	µg/L	<0.01	<0.01
PCB 105	32598-14-4		0.01	µg/L	<0.01	<0.01
PCB 118	31508-00-6		0.01	µg/L	<0.01	<0.01
PCB 126	57465-28-8		0.01	µg/L	<0.01	<0.01
PCB 128	38380-07-3		0.01	µg/L	<0.01	<0.01
PCB 138	35065-28-2		0.01	µg/L	<0.01	<0.01
PCB 153	35065-27-1		0.01	µg/L	<0.01	<0.01
PCB 169	32774-16-6		0.01	µg/L	<0.01	<0.01
PCB 170	35065-30-6		0.01	µg/L	<0.01	<0.01
PCB 180	35065-29-3		0.01	µg/L	<0.01	<0.01
PCB 187	52663-68-0		0.01	µg/L	<0.01	<0.01
Total Polychlorinated biphenyls	---		0.18	µg/L	<0.18	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	9120-3		0.2	µg/L	<0.2	<0.2
Acenaphthylene	208-96-8		0.2	µg/L	<0.2	<0.2



CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Sub-Matrix: ELUTRIATE	Client sample ID		SD3 8.9M-9.9M [02-FEB-2015] HK1504948-006	SD3 ELUTRIATE BLK [02-FEB-2015] HK1504948-007
	CAS Number	Unit		
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued				
Acenaphthene	83-32-9	0.2	<0.2	<0.2
Fluorene	86-73-7	0.2	<0.2	<0.2
Phenanthrene	85-01-8	0.2	<0.2	<0.2
Anthracene	120-12-7	0.2	<0.2	<0.2
Fluoranthene	206-44-0	0.2	<0.2	<0.2
Pyrene	129-00-0	0.2	<0.2	<0.2
Benz(a)anthracene	56-55-3	0.2	<0.2	<0.2
Chrysene	218-01-9	0.2	<0.2	<0.2
Benzo(b)fluoranthene	205-99-2	0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	<0.2	<0.2
Benzo(a)pyrene	50-32-8	0.2	<0.2	<0.2
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	<0.2	<0.2
Dibenz(a,h)anthracene	53-70-3	0.2	<0.2	<0.2
Benzo(g,h,i)perylene	19124-2	0.2	<0.2	<0.2
Low M.W. PAHs	----	2.2	<2.2	<2.2
High M.W. PAHs	----	6.8	<6.8	<6.8
EP-067_SR-A: Organochlorine Pesticides (OC)				
alpha-BHC	319-84-6	0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	<0.1	<0.1
4.4'-DDE	72-55-9	0.1	<0.1	<0.1
4.4'-DDD	72-54-8	0.1	<0.1	<0.1
Endosulfan sulfate	103107-8	0.1	<0.1	<0.1
4.4'-DDT	50-29-3	0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates				
2-Fluorobiphenyl	32160-8	0.1	54.9	62.0
4-Terphenyl-d14	1718-510	0.1	116	109
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate				
Decachlorobiphenyl	205124-3	0.1	64.8	67.6
EP-067_SR-S: Pesticide Surrogate				
Tetrachlorometaxylene	877-09-8	0.1	52.2	70.0
Dibutylchlorendate	1770-80-5	0.1	66.8	98.6



Laboratory Duplicate (DUP) Report

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
Matrix: WATER									
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826689)									
HK1504952-001	Anonymous		EK057A: Nitrite as N	----	0.01	mg/L	0.07	0.06	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826742)									
HK1504948-001	SD3 0M-0.9M		EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.89	0.90	1.1
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827090)									
HK1504948-001	SD3 0M-0.9M		EK067P: Total Phosphorus as P	----	0.01	mg/L	0.20	0.19	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827682)									
HK1505112-005	Anonymous		EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3826667)									
SD3 0.9M-1.9M									
EG020: Cadmium									
HK1504948-002			EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
EG020: Mercury									
			EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
EG020: Chromium									
			EG020: Chromium	7440-47-3	1	µg/L	<1	<1	0.0
EG020: Copper									
			EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.0
EG020: Lead									
			EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
EG020: Nickel									
			EG020: Nickel	7440-02-0	1	µg/L	<1	<1	0.0
EG020: Silver									
			EG020: Silver	7440-22-4	10	µg/L	<10	<10	0.0
EG020: Arsenic									
			EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.0
EG020: Zinc									
			EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
EG020: Cadmium									
			EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
EG020: Mercury									
			EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
EG020: Chromium									
			EG020: Chromium	7440-47-3	1	µg/L	<1	<1	0.0
EG020: Copper									
			EG020: Copper	7440-50-8	1	µg/L	<1	<1	0.0
EG020: Lead									
			EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
EG020: Nickel									
			EG020: Nickel	7440-02-0	1	µg/L	<1	<1	0.0
EG020: Silver									
			EG020: Silver	7440-22-4	1	µg/L	<1	<1	0.0
EG020: Arsenic									
			EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	0.0
EG020: Zinc									
			EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
EP-065A: PCB Single Congeners (QC Lot: 3828439)									
Anonymous									
HK1504949-008			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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
			PCB 138	35065-28-2	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 169	32774-16-6	0.01	µg/L	<0.01	<0.01	0.0



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504948

Matrix: WATER		Laboratory Duplicate (DUP) Report		LOR		Unit		Original Result		Duplicate Result		RPD (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	RPD (%)				
EP-065A: PCB Single Congeners (QC Lot: 3828439) - Continued													
HK1504949-008	Anonymous	PCB 170	35065-30-6	0.01	µg/L	<0.01	<0.01	0.0	0.0				
		PCB 180	35065-29-3	0.01	µg/L	<0.01	<0.01	0.0	0.0				
		PCB 187	52663-68-0	0.01	µg/L	<0.01	<0.01	0.0	0.0				
		Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	0.0	0.0				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824761)													
HK1504949-008	Anonymous	Naphthalene	91-20-3	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Acenaphthylene	208-96-8	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Acenaphthene	83-32-9	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Fluorene	86-73-7	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Phenanthrene	85-01-8	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Anthracene	120-12-7	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Fluoranthene	206-44-0	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Pyrene	129-00-0	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Chrysene	218-01-9	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	<0.2	0.0	0.0				
		Low M.W. PAHs	----	2.2	µg/L	<2.2	<2.2	0.0	0.0				
		High M.W. PAHs	----	6.8	µg/L	<6.8	<6.8	0.0	0.0				
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828440)													
HK1504949-008	Anonymous	alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	0.0	0.0				
		4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	0.0	0.0				
EP-390: Triorganotins (QC Lot: 3829007)													
HK1504948-001	SD3 0M-0.9M	Tributyltin	56573-85-4	6	ngSn/L	<6	<6	0.0	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			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	Value	Control Limit



Matrix: WATER

Method Blank (MB) Report

Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Method / Compound	CAS Number	LOR	Unit	Result	Spike Recovery (%)			Recovery Limits (%)			RPD (%)
					LCS	DCS	Low	High	Value	Control Limit	
ED/IEK: Inorganic Nonmetallic Parameters (QC Lot: 3826689)											
EK057A: Nitrite as N	----	0.01	mg/L	<0.01	105	107	98	112	114	-----	
ED/IEK: Inorganic Nonmetallic Parameters (QC Lot: 3826742)											
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	107	-----	92	108	-----	-----	
ED/IEK: Inorganic Nonmetallic Parameters (QC Lot: 3827090)											
EK067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	94.8	-----	91	103	-----	-----	
ED/IEK: Inorganic Nonmetallic Parameters (QC Lot: 3827682)											
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	100	-----	94	104	-----	-----	
EG: Metals and Major Cations - Filtered (QC Lot: 3826667)											
EG020: Arsenic	7440-38-2	10	µg/L	<10	110	-----	76	116	-----	-----	
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	94.9	-----	81	109	-----	-----	
EG020: Chromium	7440-47-3	1	µg/L	<1	90.4	-----	80	112	-----	-----	
EG020: Copper	7440-50-8	1	µg/L	<1	110	-----	79	115	-----	-----	
EG020: Lead	7439-92-1	1	µg/L	<1	92.7	-----	82	108	-----	-----	
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	103	-----	82	118	-----	-----	
EG020: Nickel	7440-02-0	1	µg/L	<1	115	-----	79	115	-----	-----	
EG020: Silver	7440-22-4	1	µg/L	<1	91.1	-----	78	106	-----	-----	
EG020: Zinc	7440-66-6	10	µg/L	<10	108	-----	77	119	-----	-----	
EP-065A: PCB Single Congeners (QC Lot: 3828439)											
PCB 8	34883-43-7	0.01	µg/L	<0.01	58.4	-----	50	130	-----	-----	
PCB 18	37680-65-2	0.01	µg/L	<0.01	57.6	-----	50	130	-----	-----	
PCB 28	7012-37-5	0.01	µg/L	<0.01	63.1	-----	50	130	-----	-----	
PCB 44	41464-39-5	0.01	µg/L	<0.01	69.8	-----	50	130	-----	-----	
PCB 52	35693-99-3	0.01	µg/L	<0.01	67.4	-----	50	130	-----	-----	
PCB 66	32598-10-0	0.01	µg/L	<0.01	83.7	-----	50	130	-----	-----	
PCB 77	32598-13-3	0.01	µg/L	<0.01	88.0	-----	50	130	-----	-----	
PCB 101	37680-73-2	0.01	µg/L	<0.01	80.3	-----	50	130	-----	-----	
PCB 105	32598-14-4	0.01	µg/L	<0.01	90.0	-----	50	130	-----	-----	
PCB 118	31508-00-6	0.01	µg/L	<0.01	87.1	-----	50	130	-----	-----	
PCB 126	57465-28-8	0.01	µg/L	<0.01	89.1	-----	50	130	-----	-----	
PCB 128	38380-07-3	0.01	µg/L	<0.01	90.9	-----	50	130	-----	-----	
PCB 138	35065-28-2	0.01	µg/L	<0.01	87.8	-----	50	130	-----	-----	
PCB 153	35065-27-1	0.01	µg/L	<0.01	91.5	-----	50	130	-----	-----	
PCB 169	32774-16-6	0.01	µg/L	<0.01	86.1	-----	50	130	-----	-----	
PCB 170	35065-30-6	0.01	µg/L	<0.01	88.9	-----	50	130	-----	-----	
PCB 180	35065-29-3	0.01	µg/L	<0.01	93.3	-----	50	130	-----	-----	
PCB 187	52663-68-0	0.01	µg/L	<0.01	90.2	-----	50	130	-----	-----	
Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	-----	-----	-----	-----	-----	-----	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824761)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	68.6	-----	50	98	-----	-----	
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	64.2	-----	47	97	-----	-----	
Acenaphthene	83-32-9	0.2	µg/L	<0.2	64.1	-----	49	93	-----	-----	



Matrix: WATER		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824761) - Continued									
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	67.2	-----	52	92
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	59.8	-----	51	91
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	64.7	-----	48	95
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	87.7	-----	68	109
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	92.6	-----	69	111
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	113	-----	64	119
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	118	-----	50	124
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	92.8	-----	54	124
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	109	-----	54	130
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	86.1	-----	60	120
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	68.0	-----	60	119
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	64.2	-----	48	120
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	61.1	-----	52	125
Low M.W. PAHs	-----	1.2	µg/L	<1.2	-----	-----	-----	-----	-----
High M.W. PAHs	-----	2.0	µg/L	<2.0	-----	-----	-----	-----	-----
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3828440)									
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	69.0	-----	34	123
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	77.2	-----	55	128
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	66.2	-----	45	118
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	105	-----	59	114
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	67.2	-----	42	104
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	96.2	-----	45	117
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	86.4	-----	57	116
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	95.0	-----	55	120
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	100	-----	63	122
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	118	-----	54	134
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	103	-----	67	123
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	45.6	-----	43	121
EP-390: Triorganotins (QC Lot: 3829007)									
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	97.6	-----	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	MS	MSD	Recovery Limits (%)	RPD (%)	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826689)									
HK1504952-001	Anonymous	EK057A: Nitrite as N	----	0.5 mg/L	104	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826742)									
HK1504948-001	SD3 0M-0.9M	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	110	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827090)									
HK1504948-001	SD3 0M-0.9M	EK067P: Total Phosphorus as P	----	0.5 mg/L	92.2	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827682)									
HK1504958-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	118	----	75	125	----
EG: Metals and Major Cations - Filtered (QC Lot: 3826667)									
HK1504948-001	SD3 0M-0.9M	EG020: Arsenic	7440-38-2	10 µg/L	84.2	----	75	125	----
		EG020: Cadmium	7440-43-9	10 µg/L	110	----	75	125	----
		EG020: Chromium	7440-47-3	10 µg/L	110	----	75	125	----
		EG020: Copper	7440-50-8	10 µg/L	100	----	75	125	----
		EG020: Lead	7439-92-1	10 µg/L	96.7	----	75	125	----
		EG020: Mercury	7439-97-6	0.2 µg/L	110	----	75	125	----
		EG020: Nickel	7440-02-0	10 µg/L	99.4	----	75	125	----
		EG020: Silver	7440-22-4	10 µg/L	85.7	----	75	125	----
		EG020: Zinc	7440-66-6	10 µg/L	92.0	----	75	125	----
EP-390: Triorganotins (QC Lot: 3829007)									
HK1504948-002	SD3 0.9M-1.9M	Tributyltin	56573-85-4	2 ngSn/L	100	----	70	130	----

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: ELUTRIATE			
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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	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 13
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1504949
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		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 02-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 25-FEB-2015
C-O-C number	: H026585-H026586			No. of samples received	: 8
Site	: ----			No. of samples analysed	: 8

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics



Page Number : 2 of 13
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504949

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: 23-FEB-2015

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: **HK1504949**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

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.

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



Page Number : 3 of 13
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504949

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID					
			Client sampling date / time	GB1	GB2	GB4	GB5	GB1
	Unit							
EP-390: Triorganotins	56573-85-4	0.015	µg TBT / L	<0.015	<0.015	<0.015	<0.015	<0.015
Tributyltin				<0.015	<0.015	<0.015	<0.015	<0.015
				[02-FEB-2015] HK1504949-001	[02-FEB-2015] HK1504949-002	[02-FEB-2015] HK1504949-003	[02-FEB-2015] HK1504949-004	[02-FEB-2015] HK1504949-005
								ELUTRIATE BLK



Page Number : 4 of 13
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504949

Compound	CAS Number	LOR	Client sampling date / time	Client sample ID		
				GB2	GB4	GB5
EP-390: Triorganotins	56573-85-4	0.015		ELUTRIATE BLK [02-FEB-2015] HK1504949-006	ELUTRIATE BLK [02-FEB-2015] HK1504949-007	ELUTRIATE BLK [02-FEB-2015] HK1504949-008
Tributyltin			µg TBT /L	<0.015	<0.015	<0.015



Compound	CAS Number	Client sampling date / time		Client sample ID		GB1	GB2	GB4	GB5	GB1	
		LOR	Unit	[02-FEB-2015]	HK1504949-001						[02-FEB-2015]
Sub-Matrix: ELUTRIATE											
ED/EK: Inorganic Nonmetallic Parameters											
EK055K: Ammonia as N	7664-417	0.01	mg/L	0.64	0.65	0.72	1.15	0.02	0.02	0.02	
EK057A: Nitrite as N	---	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
EK058A: Nitrate as N	14797-55-8	0.01	mg/L	0.04	0.05	0.07	0.06	0.05	0.05	0.05	
EK061P: Total Kjeldahl Nitrogen as N	---	0.1	mg/L	1.1	1.1	1.3	3.4	0.3	0.3	0.3	
EK067P: Total Phosphorus as P	---	0.01	mg/L	0.06	0.05	0.05	0.09	<0.01	<0.01	<0.01	
EK071K: Reactive Phosphorus as P	14265-44-2	10	µg/L	20	20	20	20	<10	<10	<10	
EG: Metals and Major Cations - Filtered											
EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	<10	10	<10	<10	<10	
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
EG020: Chromium	7440-47-3	1	µg/L	<1	<1	<1	<1	<1	<1	<1	
EG020: Copper	7440-50-8	1	µg/L	1	<1	1	1	2	2	2	
EG020: Lead	7439-92-1	1	µg/L	<1	<1	<1	<1	<1	<1	<1	
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
EG020: Nickel	7440-02-0	1	µg/L	1	1	1	1	1	1	1	
EG020: Silver	7440-22-4	1	µg/L	<1	<1	<1	<1	<1	<1	<1	
EG020: Zinc	7440-66-6	10	µg/L	<10	<10	<10	<10	<10	<10	<10	
EP-065A: PCB Single Congeners											
PCB 8	34863-43-7	0.01	µg/L	<0.01	<0.01	<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	<0.01	<0.01	
PCB 28	7012-37-5	0.01	µg/L	<0.01	<0.01	<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	<0.01	<0.01	
PCB 52	35693-99-3	0.01	µg/L	<0.01	<0.01	<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	<0.01	<0.01	
PCB 77	32598-13-3	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
PCB 101	37680-73-2	0.01	µg/L	<0.01	<0.01	<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	<0.01	<0.01	
PCB 118	31508-00-6	0.01	µg/L	<0.01	<0.01	<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	<0.01	<0.01	
PCB 128	38380-07-3	0.01	µg/L	<0.01	<0.01	<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	<0.01	<0.01	
PCB 153	35065-27-1	0.01	µg/L	<0.01	<0.01	<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	<0.01	<0.01	
PCB 170	35065-30-6	0.01	µg/L	<0.01	<0.01	<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	<0.01	<0.01	
PCB 187	52663-68-0	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)											
Naphthalene	9120-3	0.2	µg/L	<0.2	<0.2	<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	<0.2	<0.2	



Sub-Matrix: ELUTRIATE

Compound	CAS Number	Client sampling date / time		Client sample ID				
		LOR	Unit	GB1	GB2	GB4	GB5	GB1
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
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)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
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-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	51.0	50.3	50.4	60.2	50.3
4-Terphenyl-d14	1718-51-0	0.1	%	95.0	80.8	79.4	86.3	84.9
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	63.9	55.8	54.2	55.9	66.2
EP-067_SR-S: Pesticide Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	54.4	54.0	50.2	55.4	57.8
Dibutylchloroendate	1770-80-5	0.1	%	82.4	70.6	67.2	70.0	79.6



Sub-Matrix: ELUTRIATE	Client sample ID			
	Compound	CAS Number	LOR	Unit
ED/EK: Inorganic Nonmetallic Parameters				
EK055K: Ammonia as N	7664-417	0.01	mg/L	0.02
EK057A: Nitrite as N	---	0.01	mg/L	<0.01
EK058A: Nitrate as N	14797-55-8	0.01	mg/L	0.06
EK061P: Total Kjeldahl Nitrogen as N	---	0.1	mg/L	0.3
EK067P: Total Phosphorus as P	---	0.01	mg/L	<0.01
EK071K: Reactive Phosphorus as P	14265-44-2	10	µg/L	<10
EG: Metals and Major Cations - Filtered				
EG020: Arsenic	7440-38-2	10	µg/L	<10
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2
EG020: Chromium	7440-47-3	1	µg/L	<1
EG020: Copper	7440-50-8	1	µg/L	2
EG020: Lead	7439-92-1	1	µg/L	<1
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5
EG020: Nickel	7440-02-0	1	µg/L	1
EG020: Silver	7440-22-4	1	µg/L	<1
EG020: Zinc	7440-66-6	10	µg/L	<10
EP-065A: PCB Single Congeners				
PCB 8	34883-43-7	0.01	µg/L	<0.01
PCB 18	37680-65-2	0.01	µg/L	<0.01
PCB 28	7012-37-5	0.01	µg/L	<0.01
PCB 44	41464-39-5	0.01	µg/L	<0.01
PCB 52	35693-99-3	0.01	µg/L	<0.01
PCB 66	32598-10-0	0.01	µg/L	<0.01
PCB 77	32598-13-3	0.01	µg/L	<0.01
PCB 101	37680-73-2	0.01	µg/L	<0.01
PCB 105	32598-14-4	0.01	µg/L	<0.01
PCB 118	31508-00-6	0.01	µg/L	<0.01
PCB 126	57465-28-8	0.01	µg/L	<0.01
PCB 128	38380-07-3	0.01	µg/L	<0.01
PCB 138	35065-28-2	0.01	µg/L	<0.01
PCB 153	35065-27-1	0.01	µg/L	<0.01
PCB 169	32774-16-6	0.01	µg/L	<0.01
PCB 170	35065-30-6	0.01	µg/L	<0.01
PCB 180	35065-29-3	0.01	µg/L	<0.01
PCB 187	52663-68-0	0.01	µg/L	<0.01
Total Polychlorinated biphenyls	---	0.18	µg/L	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)				
Naphthalene	9120-3	0.2	µg/L	<0.2
Acenaphthylene	208-96-8	0.2	µg/L	<0.2



Sub-Matrix: ELUTRIATE		Client sample ID		GB2	GB4	GB5
Compound	CAS Number	LOR	Unit	ELUTRIATE BLK [02-FEB-2015] HK1504949-006	ELUTRIATE BLK [02-FEB-2015] HK1504949-007	ELUTRIATE BLK [02-FEB-2015] HK1504949-008
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued						
Acenaphthene	83-329	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)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2
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-067_SR-A: Organochlorine Pesticides (OC)						
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1
Endosulfan sulfate	103107-8	0.1	µg/L	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates						
2-Fluorobiphenyl	32160-8	0.1	%	50.2	51.4	50.2
4-Terphenyl-d14	1718-510	0.1	%	80.3	98.2	90.4
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate						
Decachlorobiphenyl	205124-3	0.1	%	64.6	65.5	71.1
EP-067_SR-S: Pesticide Surrogate						
Tetrachlorometaxylene	877-09-8	0.1	%	57.0	51.6	52.0
Dibutylchlorendate	1770-80-5	0.1	%	65.0	66.8	76.6



Laboratory Duplicate (DUP) Report

Matrix: WATER		Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826689)								
HK1504952-001	Anonymous	EK057A: Nitrite as N	----	0.01	mg/L	0.07	0.06	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826742)								
HK1504948-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.89	0.90	1.1
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827090)								
HK1504948-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	0.20	0.19	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827682)								
HK1505112-005	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3826667)								
Anonymous								
HK1504948-002	Anonymous	EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	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	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: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
		EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	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	1	2	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
EP-065A: PCB Single Congeners (QC Lot: 3828439)								
GB5								
HK1504949-004	GB5	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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
		PCB 138	35065-28-2	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 169	32774-16-6	0.01	µg/L	<0.01	<0.01	0.0



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504949

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EP-065A: PCB Single Congeners (QC Lot: 3828439) - Continued								
HK1504949-008	GB5 ELUTRIATE BLK	PCB 170	35065-30-6	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 187	52663-68-0	0.01	µg/L	<0.01	<0.01	0.0
		Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824761)								
HK1504949-008	GB5 ELUTRIATE BLK	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
		Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	0.0
		Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	0.0
		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
		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-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828440)								
HK1504949-008	GB5 ELUTRIATE BLK	alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	0.0
		beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	0.0
		gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	0.0
		delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	0.0
		Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	0.0
		4.4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	0.0
		4.4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	0.0
		4.4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	0.0
EP-390: Triorganotins (QC Lot: 3829007)								
HK1504948-001	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

Method: Compound	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report			
	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	RPD (%)
					LCS	Low	High	Value
					DCS	Low	High	Value



Matrix: WATER		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
Method/Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826689)														
EK057A: Nitrite as N	-----	0.01	mg/L	-----	0.4 mg/L	105	-----	-----	98	112	-----	-----	-----	-----
				<0.01	0.05 mg/L	107	-----	-----	88	114	-----	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826742)														
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	107	-----	-----	92	108	-----	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827090)														
EK067P: Total Phosphorus as P	-----	0.01	mg/L	<0.01	0.5 mg/L	94.8	-----	-----	91	103	-----	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827682)														
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	-----	-----	94	104	-----	-----	-----	-----
EG: Metals and Major Cations - Filtered (QC Lot: 3826667)														
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	110	-----	-----	76	116	-----	-----	-----	-----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	94.9	-----	-----	81	109	-----	-----	-----	-----
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	90.4	-----	-----	80	112	-----	-----	-----	-----
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	110	-----	-----	79	115	-----	-----	-----	-----
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	92.7	-----	-----	82	108	-----	-----	-----	-----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	103	-----	-----	82	118	-----	-----	-----	-----
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	115	-----	-----	79	115	-----	-----	-----	-----
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	91.1	-----	-----	78	106	-----	-----	-----	-----
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	108	-----	-----	77	119	-----	-----	-----	-----
EP-065A: PCB Single Congeners (QC Lot: 3828439)														
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	58.4	-----	-----	50	130	-----	-----	-----	-----
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	57.6	-----	-----	50	130	-----	-----	-----	-----
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	63.1	-----	-----	50	130	-----	-----	-----	-----
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	69.8	-----	-----	50	130	-----	-----	-----	-----
PCB 52	35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	67.4	-----	-----	50	130	-----	-----	-----	-----
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	83.7	-----	-----	50	130	-----	-----	-----	-----
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	88.0	-----	-----	50	130	-----	-----	-----	-----
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	80.3	-----	-----	50	130	-----	-----	-----	-----
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	90.0	-----	-----	50	130	-----	-----	-----	-----
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	87.1	-----	-----	50	130	-----	-----	-----	-----
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	89.1	-----	-----	50	130	-----	-----	-----	-----
PCB 128	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	90.9	-----	-----	50	130	-----	-----	-----	-----
PCB 138	35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	87.8	-----	-----	50	130	-----	-----	-----	-----
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	91.5	-----	-----	50	130	-----	-----	-----	-----
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	86.1	-----	-----	50	130	-----	-----	-----	-----
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	88.9	-----	-----	50	130	-----	-----	-----	-----
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	93.3	-----	-----	50	130	-----	-----	-----	-----
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	90.2	-----	-----	50	130	-----	-----	-----	-----
Total Polychlorinated biphenyls	-----	0.18	µg/L	<0.18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824761)														
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	68.6	-----	-----	50	98	-----	-----	-----	-----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	64.2	-----	-----	47	97	-----	-----	-----	-----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	64.1	-----	-----	49	93	-----	-----	-----	-----



Matrix: WATER		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824761) - Continued											
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	67.2	-----	52	92	-----	-----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	59.8	-----	51	91	-----	-----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	64.7	-----	48	95	-----	-----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	87.7	-----	68	109	-----	-----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	92.6	-----	69	111	-----	-----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	113	-----	64	119	-----	-----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	118	-----	50	124	-----	-----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	92.8	-----	54	124	-----	-----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	109	-----	54	130	-----	-----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	86.1	-----	60	120	-----	-----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	68.0	-----	60	119	-----	-----
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	64.2	-----	48	120	-----	-----
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	61.1	-----	52	125	-----	-----
Low M.W. PAHs	-----	1.2	µg/L	<1.2	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	2.0	µg/L	<2.0	-----	-----	-----	-----	-----	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828440)											
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	69.0	-----	34	123	-----	-----
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	77.2	-----	55	128	-----	-----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	66.2	-----	45	118	-----	-----
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	105	-----	59	114	-----	-----
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	67.2	-----	42	104	-----	-----
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	96.2	-----	45	117	-----	-----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	86.4	-----	57	116	-----	-----
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	95.0	-----	55	120	-----	-----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	100	-----	63	122	-----	-----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	118	-----	54	134	-----	-----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	103	-----	67	123	-----	-----
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	45.6	-----	43	121	-----	-----
EP-390: Triorganotin (QC Lot: 3829007)											
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	97.6	-----	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	MS	MSD	Recovery Limits (%)	RPD (%)	
				MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826689)									
HK1504952-001	Anonymous	EK057A: Nitrite as N	----	0.5 mg/L	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826742)									
HK1504948-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827090)									
HK1504948-001	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827682)									
HK1504958-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 3826667)									
HK1504948-001 Anonymous									
		EG020: Arsenic	7440-38-2	10 µg/L	----	75	125	----	----
		EG020: Cadmium	7440-43-9	10 µg/L	----	75	125	----	----
		EG020: Chromium	7440-47-3	10 µg/L	----	75	125	----	----
		EG020: Copper	7440-50-8	10 µg/L	----	75	125	----	----
		EG020: Lead	7439-92-1	10 µg/L	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.2 µg/L	----	75	125	----	----
		EG020: Nickel	7440-02-0	10 µg/L	----	75	125	----	----
		EG020: Silver	7440-22-4	10 µg/L	----	75	125	----	----
		EG020: Zinc	7440-66-6	10 µg/L	----	75	125	----	----
EP-390: Triorganotin (QC Lot: 3829007)									
HK1504948-002	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	----	70	130	----	----

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: ELUTRIATE			
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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

CERTIFICATE OF ANALYSIS

Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 : MR SUN NG
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 GEOTECHNICAL ENGINEERING OFFICE,
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 E-mail : sunng@cedd.gov.hk
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 Facsimile : ---
 Project : AGREEMENT NO CE63_2012 (DS)
 EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
 Order number : GE/2014/21.01
 C-O-C number : H026563
 Site : ---

Laboratory : ALS Technichem HK Pty Ltd
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 Quote number : HK/1393/2014
 Page : 1 of 9
 Work Order : HK1504950
 Date Samples Received : 03-FEB-2015
 Issue Date : 25-FEB-2015
 No. of samples received : 4
 No. of samples analysed : 4

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 Hong Kong Accreditation Service (HKAS) has accredited 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

Chan Chi Wai, Chris
 Chan Ka Yu, Karen
 Tai Yuk Lun, Stephen

Authorised results for

Inorganics
 Organics
 Organics

Position

Chemist
 Manager - Organics
 Senior Chemist - Food



Page Number : 2 of 9
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504950

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: 18-FEB-2015

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: **HK1504950**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction. Sample(s) were received in an ambient 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 D3974-09 based on ASTM D3974-09, prior to determination of metals.

Analysis of Tributyltin in interstitial water was cancelled due to insufficient volume of interstitial water except Sample #1 SD5 0M-0.9M.

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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Client sample ID

Client sampling date / time

LOR

Unit

Compound

SD5 0M-0.9M

SD5 0.9M-1.9M

SD5 1.9M-2.9M

SD5 2.9M-3.9M

SD5

Compound	CAS Number	LOR	Unit	SD5 0M-0.9M [03-FEB-2015] HK1504950-001	SD5 0.9M-1.9M [03-FEB-2015] HK1504950-002	SD5 1.9M-2.9M [03-FEB-2015] HK1504950-003	SD5 2.9M-3.9M [03-FEB-2015] HK1504950-004
EA/ED: Physical and Aggregate Properties							
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	45.6	36.7	39.1	32.3
EG: Metals and Major Cations							
EG020: Arsenic	7440-38-2	1	mg/kg	10	7	9	10
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2
EG020: Chromium	7440-47-3	1	mg/kg	27	24	30	23
EG020: Copper	7440-50-8	1	mg/kg	13	8	10	12
EG020: Lead	7439-92-1	1	mg/kg	46	31	37	46
EG020: Mercury	7439-97-6	0.05	mg/kg	0.08	<0.05	<0.05	<0.05
EG020: Nickel	7440-02-0	1	mg/kg	15	15	18	14
EG020: Silver	7440-22-4	0.1	mg/kg	0.2	<0.1	0.1	0.2
EG020: Zinc	7440-66-6	1	mg/kg	95	75	84	80
EP-065: PCB Single Congeners							
PCB 8	34883-43-7	3	µg/kg	<3	<3	<3	<3
PCB 18	37680-65-2	3	µg/kg	<3	<3	<3	<3
PCB 28	7012-37-5	3	µg/kg	<3	<3	<3	<3
PCB 44	41464-39-5	3	µg/kg	<3	<3	<3	<3
PCB 52	35693-99-3	3	µg/kg	<3	<3	<3	<3
PCB 66	32598-10-0	3	µg/kg	<3	<3	<3	<3
PCB 77	32598-13-3	3	µg/kg	<3	<3	<3	<3
PCB 101	37680-73-2	3	µg/kg	<3	<3	<3	<3
PCB 105	32598-14-4	3	µg/kg	<3	<3	<3	<3
PCB 118	31508-00-6	3	µg/kg	<3	<3	<3	<3
PCB 126	57465-28-8	3	µg/kg	<3	<3	<3	<3
PCB 128	38380-07-3	3	µg/kg	<3	<3	<3	<3
PCB 138	35065-28-2	3	µg/kg	<3	<3	<3	<3
PCB 153	35065-27-1	3	µg/kg	<3	<3	<3	<3
PCB 169	32774-16-6	3	µg/kg	<3	<3	<3	<3
PCB 170	35065-30-6	3	µg/kg	<3	<3	<3	<3
PCB 180	35065-29-3	3	µg/kg	<3	<3	<3	<3
PCB 187	52663-68-0	3	µg/kg	<3	<3	<3	<3
Total Polychlorinated biphenyls	----	18	µg/kg	<18	<18	<18	<18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)							
Naphthalene	91-20-3	50	µg/kg	<50	<50	<50	<50
Acenaphthylene	208-96-8	50	µg/kg	<50	<50	<50	<50
Acenaphthene	83-32-9	50	µg/kg	<50	<50	<50	<50
Fluorene	86-73-7	50	µg/kg	<50	<50	<50	<50
Phenanthrene	85-01-8	50	µg/kg	<50	<50	<50	<50



Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		SD5 0M-0.9M [03-FEB-2015] HK1504950-001	SD5 0.9M-1.9M [03-FEB-2015] HK1504950-002	SD5 1.9M-2.9M [03-FEB-2015] HK1504950-003	SD5 2.9M-3.9M [03-FEB-2015] HK1504950-004
			Client sampling date / time	Unit				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
Anthracene	120-12-7	50		µg/kg	<50	<50	<50	<50
Fluoranthene	206-44-0	150		µg/kg	<150	<150	<150	<150
Pyrene	129-00-0	150		µg/kg	<150	<150	<150	<150
Benz(a)anthracene	56-55-3	150		µg/kg	<150	<150	<150	<150
Chrysene	218-019	150		µg/kg	<150	<150	<150	<150
Benzo(b)fluoranthene	205-99-2	150		µg/kg	<150	<150	<150	<150
Benzo(k)fluoranthene	207-08-9	150		µg/kg	<150	<150	<150	<150
Benzo(a)pyrene	50-32-8	150		µg/kg	<150	<150	<150	<150
Indeno(1,2,3-cd)pyrene	193-39-5	150		µg/kg	<150	<150	<150	<150
Dibenz(a,h)anthracene	53-70-3	150		µg/kg	<150	<150	<150	<150
Benzo(g,h,i)perylene	19124-2	150		µg/kg	<150	<150	<150	<150
Low M.W. PAHs	---	550		µg/kg	<550	<550	<550	<550
High M.W. PAHs	---	1700		µg/kg	<1700	<1700	<1700	<1700
EP-076S: Polycyclic Aromatic Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	32160-8	0.1		%	83.8	108	92.8	91.0
4-Terphenyl-d14	1718-510	0.1		%	78.0	123	87.8	91.6
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								
Decachlorobiphenyl	205124-3	0.1		%	58.7	65.0	64.9	65.3

Surrogate control limits listed at end of this report.

Surrogate control limits listed at end of this report.



Page Number : 5 of 9
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504950

Sub-Matrix: INTERSTITIAL WATER		Client sample ID	Client sampling date / time	Client sample ID
Compound	CAS Number	LOR	Unit	Unit
EP-390: Triorganotins	56573-85-4	0.015	µg TBT / L	SD5 0M-0.9M [03-FEB-2015] HK1504950-001
Tributyltin				<0.015



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method : Compound	CAS Number	Laboratory Duplicate (DUP) Report			RPD (%)	
				LOR	Unit	Original Result		Duplicate Result
EA/ED: Physical and Aggregate Properties (QC Lot: 3819002)								
HK1504765-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	47.1	47.7	1.3
HK1504950-001	SD5 0M-0.9M	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	45.6	45.8	0.4
EG: Metals and Major Cations (QC Lot: 3819141)								
Anonymous								
HK1504765-001	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.10	0.09	10.6
		EG020: Silver	7440-22-4	0.1	mg/kg	0.2	0.2	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	12	12	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	27	25	5.7
		EG020: Copper	7440-50-8	1	mg/kg	15	16	7.8
		EG020: Lead	7439-92-1	1	mg/kg	53	55	3.9
		EG020: Nickel	7440-02-0	1	mg/kg	16	14	7.1
		EG020: Zinc	7440-66-6	1	mg/kg	97	93	4.1
HK1504825-004	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.07	0.08	18.1
		EG020: Silver	7440-22-4	0.1	mg/kg	0.9	1.0	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	9	8	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	39	40	0.0
		EG020: Copper	7440-50-8	1	mg/kg	40	41	3.9
		EG020: Lead	7439-92-1	1	mg/kg	53	56	6.0
		EG020: Nickel	7440-02-0	1	mg/kg	23	24	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	167	174	4.1
EP-065: PCB Single Congeners (QC Lot: 3817752)								
Anonymous								
HK1504765-001	Anonymous	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659)								



Matrix: SOIL		Laboratory Duplicate (DUP) Report		Laboratory Duplicate (DUP) Report		Laboratory Duplicate (DUP) Report		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659) - Continued								
HK1504792-002	Anonymous	High M.W. PAHs	-----	1700		<1700	<1700	0.0
		Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenzo(a,h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g,h,i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
		Low M.W. PAHs	-----	550		<550	<550	0.0

Matrix: WATER		Laboratory Duplicate (DUP) Report		Laboratory Duplicate (DUP) Report		Laboratory Duplicate (DUP) Report		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-390: Triorganotins (QC Lot: 3821358)	Anonymous	Tributyltin	56573-85-4	5	ngSn/L	<5	<5	0.0

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		Laboratory Control Spike Duplicate (DCS) Report		Laboratory Control Spike Duplicate (DCS) Report	
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	RPD (%)
						Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 3819141)									
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	76	112	-----	-----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	79	111	-----	-----
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	76	118	-----	-----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	79	105	-----	-----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	80	104	-----	-----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	76	112	-----	-----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	79	105	-----	-----
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	76	106	-----	-----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	76	114	-----	-----
EP-065: PCB Single Congeners (QC Lot: 3817752)									
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	41	126	-----	-----
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	36	118	-----	-----
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	35	119	-----	-----
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	26	124	-----	-----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	26	124	-----	-----



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	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-065: PCB Single Congeners (QC Lot: 3817752) - Continued											
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	102	102	24	125		
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	102	102	51	122		
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	95.5	95.5	46	122		
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	99.3	99.3	52	122		
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	97.9	97.9	50	123		
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	103	103	53	121		
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	99.7	99.7	54	124		
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	97.3	97.3	51	123		
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	98.2	98.2	51	124		
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	101	101	55	126		
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	99.1	99.1	58	124		
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	99.4	99.4	56	126		
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	96.7	96.7	51	123		
Total Polychlorinated biphenyls											
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659)											
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	97.4	97.4	68	107		
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	97.5	97.5	70	113		
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	96.4	96.4	68	108		
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	106	106	71	111		
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	107	107	71	110		
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	103	103	63	117		
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	108	108	72	113		
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	111	111	72	112		
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	113	113	70	119		
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	111	111	79	112		
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	114	114	68	125		
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	104	104	75	113		
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	114	114	64	118		
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	100	100	61	127		
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	88.8	88.8	66	112		
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	111	111	73	114		
Low M.W. PAHs		550	µg/kg	<550							
High M.W. PAHs		1700	µg/kg	<1700							
Matrix: WATER											
Method Blank (MB) Report											
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-390: Triorganotins (QC Lot: 3821358)	56573-85-4	5	ngSn/L	<5	2 ngSn/L	97.6	97.6	70	130		
Tributyltin											



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	MS	MSD	Recovery Limits (%)	RPD (%)	
EG: Metals and Major Cations (QC Lot: 3819141)									
HK1504224-001	Anonymous								
		EG020: Arsenic	7440-38-2	5 mg/kg	106		75	125	
		EG020: Cadmium	7440-43-9	5 mg/kg	103		75	125	
		EG020: Chromium	7440-47-3	5 mg/kg	101		75	125	
		EG020: Copper	7440-50-8	5 mg/kg	97.1		75	125	
		EG020: Lead	7439-92-1	5 mg/kg	86.8		75	125	
		EG020: Mercury	7439-97-6	0.1 mg/kg	80.9		75	125	
		EG020: Nickel	7440-02-0	5 mg/kg	98.3		75	125	
		EG020: Silver	7440-22-4	5 mg/kg	90.1		75	125	
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined		75	125	

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
				Spike Concentration	MS	MSD	Recovery Limits (%)	RPD (%)	
EP-390: Triorganotins (QC Lot: 3821358)									
HK1504665-004	Anonymous								
		Tributyltin	56573-85-4	2 ngSn/L	96.8		70	130	

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
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

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ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
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Project : AGREEMENT NO CE63_2012 (DS)
EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026564
Site : ----

Laboratory : ALS Technichem HK Pty Ltd
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Quote number : HK/1393/2014

Page : 1 of 5
Work Order : HK1504951

Date Samples Received : 03-FEB-2015
Issue Date : 25-FEB-2015
No. of samples received : 4
No. of samples analysed : 4

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics

Page Number : 2 of 5
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504951



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: 18-FEB-2015

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: **HK1504951**

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

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		SD5 0M-0.9M [03-FEB-2015] HK1504951-001	SD5 0.9M-1.9M [03-FEB-2015] HK1504951-002	SD5 1.9M-2.9M [03-FEB-2015] HK1504951-003	SD5 2.9M-3.9M [03-FEB-2015] HK1504951-004
			Client sampling date / time	Unit				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%		45.6	36.7	39.1	32.3
ED/EK: Inorganic Nonmetallic Parameters								
EK055: Ammonia as N	7664-417	0.1	mg/kg		10.8	4.6	4.1	3.1
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg		1110	787	795	431
EK067A: Total Phosphorus as P	----	1	mg/kg		486	378	434	282
EP-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Aldrin	309-00-2	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Endosulfan 1	959-98-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
4,4'-DDE	72-55-9	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
4,4'-DDD	72-54-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
4,4'-DDT	50-29-3	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
EP-067_SR-S: Pesticide Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%		63.2	79.4	79.6	76.8
Dibutylchlorendate	1770-80-5	0.1	%		56.0	67.8	61.0	66.4
					Surrogate control limits listed at end of this report.			



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Laboratory Duplicate (DUP) Report			RPD (%)
					Unit	Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3818994)								
HK1504839-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	47.1	47.7	1.3	
HK1504951-001	SD5 0M-0.9M	EA055: Moisture Content (dried @ 103°C)	----	0.1	45.6	45.8	0.4	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)								
HK1504844-001	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	----	1	1510	1470	3.0	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)								
HK1504839-001	Anonymous	EK067A: Total Phosphorus as P	----	1	558	520	7.0	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825432)								
HK1504161-001	Anonymous	EK055: Ammonia as N	7664-41-7	10	<10	<10	0.0	
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3817759)								
HK1504839-001	Anonymous	alpha-BHC	319-84-6	0.50	<0.50	<0.50	0.0	
		beta-BHC	319-85-7	0.50	<0.50	<0.50	0.0	
		gamma-BHC	58-89-9	0.50	<0.50	<0.50	0.0	
		delta-BHC	319-86-8	0.50	<0.50	<0.50	0.0	
		Heptachlor	76-44-8	0.50	<0.50	<0.50	0.0	
		Aldrin	309-00-2	0.50	<0.50	<0.50	0.0	
		Heptachlor epoxide	1024-57-3	0.50	<0.50	<0.50	0.0	
		Endosulfan 1	959-98-8	0.50	<0.50	<0.50	0.0	
		4,4'-DDE	72-55-9	0.50	<0.50	<0.50	0.0	
		4,4'-DDD	72-54-8	0.50	<0.50	<0.50	0.0	
		Endosulfan sulfate	1031-07-8	0.50	<0.50	<0.50	0.0	
		4,4'-DDT	50-29-3	0.50	<0.50	<0.50	0.0	

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

Method/Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report			RPD (%)	
						LCS	Spike Recovery (%)	DCS		Recovery Limits (%)	Value	Control Limit
Method Blank (MB) Report										
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3818998)										
EK057A: Nitrite as N (Sol)	----	0.1	mg/kg	<0.1	2 mg/kg	107	85	115	-----	-----
Method Blank (MB) Report										
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)										
EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	104	85	115	-----	-----
Method Blank (MB) Report										
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)										
EK067A: Total Phosphorus as P	----	20	mg/kg	<20	695 mg/kg	90.9	85	115	-----	-----
Method Blank (MB) Report										
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825432)										
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	98.2	89	113	-----	-----
Method Blank (MB) Report										
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3817759)										
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	78.8	55	106	-----	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	76.6	37	123	-----	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	78.2	43	112	-----	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	80.0	64	113	-----	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	83.8	42	113	-----	-----



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	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3817759) - Continued											
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	89.2	-----	57	106	-----	-----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	76.4	-----	61	108	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	74.2	-----	55	120	-----	-----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	78.2	-----	60	116	-----	-----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	70.6	-----	52	127	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	72.6	-----	56	120	-----	-----
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	75.8	-----	45	126	-----	-----

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

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

Surrogate Control Limits

Sub-Matrix: SEDIMENT		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

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ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 10
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1504952
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E-mail	: suning@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com	Date Samples Received	: 03-FEB-2015
Telephone	: ----	Telephone	: +852 2610 1044	Issue Date	: 25-FEB-2015
Facsimile	: ----	Facsimile	: +852 2610 2021	No. of samples received	: 5
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	No. of samples analysed	: 5
Order number	: GE/2014/21.01				
C-O-C number	: H026565-H026566				
Site	: ----				

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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: Chan Ka Yu, Karen; Fung Lim Chee, Richard
Position: Manager - Organics; General Manager
Authorised results for: Organics; Inorganics



Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504952

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:

23-FEB-2015

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: **HK1504952**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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

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

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



Page Number : 3 of 10
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504952

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time	Unit	Client sample ID				
					SD5 0M-0.9M [03-FEB-2015] HK1504952-001	SD5 0.9M-1.9M [03-FEB-2015] HK1504952-002	SD5 1.9M-2.9M [03-FEB-2015] HK1504952-003	SD5 2.9M-3.9M [03-FEB-2015] HK1504952-004	SD5 ELUTRIATE BLK [03-FEB-2015] HK1504952-005
EP-390: Triorganotin	56573-85-4	0.015		µg TBT /L	<0.015	<0.015	<0.015	<0.015	<0.015
Tributyltin					<0.015	<0.015	<0.015	<0.015	<0.015



Compound	CAS Number	LOR	Unit	Client sample ID					SD5 ELUTRIATE BLK [03-FEB-2015] HK1504952-005
				SD5 0M-0.9M [03-FEB-2015] HK1504952-001	SD5 0.9M-1.9M [03-FEB-2015] HK1504952-002	SD5 1.9M-2.9M [03-FEB-2015] HK1504952-003	SD5 2.9M-3.9M [03-FEB-2015] HK1504952-004	SD5 ELUTRIATE BLK [03-FEB-2015] HK1504952-005	
				Client sampling date / time	Client sampling date / time	Client sampling date / time	Client sampling date / time	Client sampling date / time	
ED/EK: Inorganic Nonmetallic Parameters									
EK055K: Ammonia as N	7664-417	0.01	mg/L	0.96	0.58	0.47	0.45	0.04	
EK057A: Nitrite as N	----	0.01	mg/L	0.07	0.05	<0.01	0.06	<0.01	
EK058A: Nitrate as N	14797-55-8	0.01	mg/L	0.06	0.09	0.14	0.09	0.09	
EK061P: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.4	1.0	0.9	1.0	0.3	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.25	0.22	0.16	0.19	<0.01	
EK071K: Reactive Phosphorus as P	14265-44-2	10	µg/L	220	200	140	140	<10	
EG: Metals and Major Cations - Filtered									
EG020: Arsenic	7440-38-2	10	µg/L	30	20	<10	20	<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	2	2	2	
EG020: Lead	7439-92-1	1	µg/L	<1	<1	<1	1	<1	
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
EG020: Nickel	7440-02-0	1	µg/L	1	<1	<1	1	1	
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	16	
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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	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	
PCB 153	35065-27-1	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 180	35065-29-3	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	
Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	9120-3	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	



Sub-Matrix: ELUTRIATE		Client sample ID				SD5	SD5	SD5	SD5	SD5	SD5	ELUTRIATE BLK
Compound	CAS Number	LOR	Unit	Client sampling date / time	0M-0.9M [03-FEB-2015] HK1504952-001	0.9M-1.9M [03-FEB-2015] HK1504952-002	1.9M-2.9M [03-FEB-2015] HK1504952-003	2.9M-3.9M [03-FEB-2015] HK1504952-004	SD5	SD5	HK1504952-005	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued												
Acenaphthene	83-32-9	0.2	µg/L		<0.2	<0.2	<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	<0.2	<0.2	
Phenanthrene	85-018	0.2	µg/L		<0.2	<0.2	<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	<0.2	<0.2	
Fluoranthene	206-44-0	0.2	µg/L		<0.2	<0.2	<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	<0.2	<0.2	
Benz(a)anthracene	56-55-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Chrysene	218-019	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Benzo(b)fluoranthene	205-99-2	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Benzo(k)fluoranthene	207-08-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Benzo(a)pyrene	50-32-8	0.2	µg/L		<0.2	<0.2	<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	<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	<0.2	<0.2	
Benzo(g,h,i)perylene	19124-2	0.2	µg/L		<0.2	<0.2	<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	<2.2	<2.2	
High M.W. PAHs	****	6.8	µg/L		<6.8	<6.8	<6.8	<6.8	<6.8	<6.8	<6.8	
EP-067_SR-A: Organochlorine Pesticides (OC)												
alpha-BHC	319-84-6	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
beta-BHC	319-85-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
gamma-BHC	58-89-9	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
delta-BHC	319-86-8	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Heptachlor	76-44-8	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Aldrin	309-00-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Heptachlor epoxide	1024-57-3	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Endosulfan 1	959-98-8	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
4.4'-DDE	72-55-9	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
4.4'-DDD	72-54-8	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Endosulfan sulfate	103107-8	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
4.4'-DDT	50-29-3	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates												
2-Fluorobiphenyl	32160-8	0.1	%		58.8	76.6	51.6	50.1	51.6	52.5	52.5	
4-Terphenyl-d14	1718-51-0	0.1	%		87.2	91.5	86.2	92.0	86.2	96.4	96.4	
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate												
Decachlorobiphenyl	205124-3	0.1	%		60.5	62.7	55.3	62.0	55.3	72.4	72.4	
EP-067_SR-S: Pesticide Surrogate												
Tetrachlorometaxylene	877-09-8	0.1	%		67.0	72.8	62.4	52.6	62.4	51.2	51.2	
Dibutylchlorodate	1770-80-5	0.1	%		80.2	66.2	80.4	71.0	80.4	78.4	78.4	



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826689)								
HK1504952-001	SD5 0M-0.9M	EK057A: Nitrite as N	----	0.01	mg/L	0.07	0.06	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826742)								
HK1504948-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.89	0.90	1.1
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827090)								
HK1504948-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	0.20	0.19	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827682)								
HK1505112-005	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3826667)								
Anonymous								
HK1504948-002	Anonymous	EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	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	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: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
Anonymous								
HK1504949-004	Anonymous	EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	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	1	2	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
EP-065A: PCB Single Congeners (QC Lot: 3828439)								
Anonymous								
HK1504949-008	Anonymous	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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
		PCB 138	35065-28-2	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 169	32774-16-6	0.01	µg/L	<0.01	<0.01	0.0



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504952

Matrix: WATER		Method: Compound		Laboratory Duplicate (DUP) Report		RPD (%)
Laboratory sample ID	Client sample ID	CAS Number	LOR	Unit	Original Result		Duplicate Result
EP-065A: PCB Single Congeners (QC Lot: 3828439) - Continued						
HK1504949-008	Anonymous	35065-30-6	0.01	µg/L	<0.01	<0.01
		35065-29-3	0.01	µg/L	<0.01	<0.01
		52663-68-0	0.01	µg/L	<0.01	<0.01
		-----	0.18	µg/L	<0.18	<0.18
Total Polychlorinated biphenyls						
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824761)						
HK1504949-008	Anonymous	91-20-3	0.2	µg/L	<0.2	<0.2
		208-96-8	0.2	µg/L	<0.2	<0.2
		83-32-9	0.2	µg/L	<0.2	<0.2
		86-73-7	0.2	µg/L	<0.2	<0.2
		85-01-8	0.2	µg/L	<0.2	<0.2
		120-12-7	0.2	µg/L	<0.2	<0.2
		206-44-0	0.2	µg/L	<0.2	<0.2
		129-00-0	0.2	µg/L	<0.2	<0.2
		56-55-3	0.2	µg/L	<0.2	<0.2
		218-01-9	0.2	µg/L	<0.2	<0.2
		205-99-2	0.2	µg/L	<0.2	<0.2
		207-08-9	0.2	µg/L	<0.2	<0.2
		50-32-8	0.2	µg/L	<0.2	<0.2
		193-39-5	0.2	µg/L	<0.2	<0.2
		53-70-3	0.2	µg/L	<0.2	<0.2
		191-24-2	0.2	µg/L	<0.2	<0.2
		-----	2.2	µg/L	<2.2	<2.2
		-----	6.8	µg/L	<6.8	<6.8
EP-067 SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828440)						
HK1504949-008	Anonymous	319-84-6	0.1	µg/L	<0.1	<0.1
		319-85-7	0.1	µg/L	<0.1	<0.1
		58-89-9	0.1	µg/L	<0.1	<0.1
		319-86-8	0.1	µg/L	<0.1	<0.1
		76-44-8	0.1	µg/L	<0.1	<0.1
		309-00-2	0.1	µg/L	<0.1	<0.1
		1024-57-3	0.1	µg/L	<0.1	<0.1
		959-98-8	0.1	µg/L	<0.1	<0.1
		72-55-9	0.1	µg/L	<0.1	<0.1
		72-54-8	0.1	µg/L	<0.1	<0.1
		1031-07-8	0.1	µg/L	<0.1	<0.1
		50-29-3	0.1	µg/L	<0.1	<0.1
EP-390: Triorganotins (QC Lot: 3829007)						
HK1504948-001	Anonymous	56573-85-4	6	ngSn/L	<6	<6
EP-390: Triorganotins (QC Lot: 3829008)						
HK1504957-001	Anonymous	56573-85-4	6	ngSn/L	<6	<6

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 Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
Method/Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	High	Low	Value	RPD (%)	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826689)														
EK057A: Nitrite as N	---	0.01	mg/L	<0.01	0.4 mg/L 0.05 mg/L	105 107	---	---	98 88	112 114	---	---	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826742)														
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	107	---	---	92	108	---	---	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827090)														
EK067P: Total Phosphorus as P	---	0.01	mg/L	<0.01	0.5 mg/L	94.8	---	---	91	103	---	---	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827682)														
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	---	---	94	104	---	---	---	---
EG: Metals and Major Cations - Filtered (QC Lot: 3826667)														
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	110	---	---	76	116	---	---	---	---
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	94.9	---	---	81	109	---	---	---	---
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	90.4	---	---	80	112	---	---	---	---
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	110	---	---	79	115	---	---	---	---
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	92.7	---	---	82	108	---	---	---	---
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	103	---	---	82	118	---	---	---	---
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	115	---	---	79	115	---	---	---	---
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	91.1	---	---	78	106	---	---	---	---
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	108	---	---	77	119	---	---	---	---
EP-065A: PCB Single Congeners (QC Lot: 3828439)														
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	58.4	---	---	50	130	---	---	---	---
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	57.6	---	---	50	130	---	---	---	---
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	63.1	---	---	50	130	---	---	---	---
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	69.8	---	---	50	130	---	---	---	---
PCB 52	35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	67.4	---	---	50	130	---	---	---	---
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	83.7	---	---	50	130	---	---	---	---
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	88.0	---	---	50	130	---	---	---	---
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	80.3	---	---	50	130	---	---	---	---
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	90.0	---	---	50	130	---	---	---	---
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	87.1	---	---	50	130	---	---	---	---
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	89.1	---	---	50	130	---	---	---	---
PCB 128	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	90.9	---	---	50	130	---	---	---	---
PCB 138	35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	87.8	---	---	50	130	---	---	---	---
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	91.5	---	---	50	130	---	---	---	---
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	86.1	---	---	50	130	---	---	---	---
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	88.9	---	---	50	130	---	---	---	---
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	93.3	---	---	50	130	---	---	---	---
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	90.2	---	---	50	130	---	---	---	---
Total Polychlorinated biphenyls	---	0.18	µg/L	<0.18	---	---	---	---	---	---	---	---	---	---
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824761)														
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	68.6	---	---	50	98	---	---	---	---
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	64.2	---	---	47	97	---	---	---	---
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	64.1	---	---	49	93	---	---	---	---



Method: Compound	CAS Number	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
		LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824761) - Continued												
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	67.2	-----	-----	52	92	-----	-----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	59.8	-----	-----	51	91	-----	-----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	64.7	-----	-----	48	95	-----	-----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	87.7	-----	-----	68	109	-----	-----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	92.6	-----	-----	69	111	-----	-----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	113	-----	-----	64	119	-----	-----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	118	-----	-----	50	124	-----	-----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	92.8	-----	-----	54	124	-----	-----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	109	-----	-----	54	130	-----	-----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	86.1	-----	-----	60	120	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	68.0	-----	-----	60	119	-----	-----
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	64.2	-----	-----	48	120	-----	-----
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	61.1	-----	-----	52	125	-----	-----
Low M.W. PAHs	-----	1.2	µg/L	<1.2	-----	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	2.0	µg/L	<2.0	-----	-----	-----	-----	-----	-----	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828440)												
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	69.0	-----	-----	34	123	-----	-----
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	77.2	-----	-----	55	128	-----	-----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	66.2	-----	-----	45	118	-----	-----
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	105	-----	-----	59	114	-----	-----
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	67.2	-----	-----	42	104	-----	-----
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	96.2	-----	-----	45	117	-----	-----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	86.4	-----	-----	57	116	-----	-----
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	95.0	-----	-----	55	120	-----	-----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	100	-----	-----	63	122	-----	-----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	118	-----	-----	54	134	-----	-----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	103	-----	-----	67	123	-----	-----
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	45.6	-----	-----	43	121	-----	-----
EP-390: Triorganotins (QC Lot: 3829007)												
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	97.6	-----	-----	70	130	-----	-----
EP-390: Triorganotins (QC Lot: 3829008)												
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	96.8	-----	-----	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	MS	MSD	Low	High	Value	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826689)										
HK1504952-001	SD5 0M-0.9M	EK057A: Nitrite as N	----	0.5 mg/L	104	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826742)										
HK1504948-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	110	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827090)										
HK1504948-001	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	92.2	----	75	125	----	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827682)										
HK1504958-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	118	----	75	125	----	----
EG: Metals and Major Cations - Filtered (QC Lot: 3826667)										
HK1504948-001	Anonymous	EG020: Arsenic	7440-38-2	10 µg/L	84.2	----	75	125	----	----
		EG020: Cadmium	7440-43-9	10 µg/L	110	----	75	125	----	----
		EG020: Chromium	7440-47-3	10 µg/L	110	----	75	125	----	----
		EG020: Copper	7440-50-8	10 µg/L	100	----	75	125	----	----
		EG020: Lead	7439-92-1	10 µg/L	96.7	----	75	125	----	----
		EG020: Mercury	7439-97-6	0.2 µg/L	110	----	75	125	----	----
		EG020: Nickel	7440-02-0	10 µg/L	99.4	----	75	125	----	----
		EG020: Silver	7440-22-4	10 µg/L	85.7	----	75	125	----	----
		EG020: Zinc	7440-66-6	10 µg/L	92.0	----	75	125	----	----
EP-390: Triorganotins (QC Lot: 3829007)										
HK1504948-002	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	100	----	70	130	----	----
EP-390: Triorganotins (QC Lot: 3829008)										
HK1504957-001	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	100	----	70	130	----	----

Surrogate Control Limits

Sub-Matrix: ELUTRIATE		Recovery Limits (%)	
Compound	CAS Number	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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 10
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1504953
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 1/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com	Date Samples Received	: 04-FEB-2015
Telephone	: ----	Telephone	: +852 2610 1044	Issue Date	: 25-FEB-2015
Facsimile	: ----	Facsimile	: +852 2610 2021	No. of samples received	: 5
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	No. of samples analysed	: 5
Order number	: GE/2014/21.01				
C-O-C number	: H026567				
Site	: ----				

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Hong Kong Accreditation Service (HKAS) has accredited 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

Chen Chi Wai, Chris
Chen Ka Yu, Karen
Tai Yuk Lun, Stephen

Position

Chemist
Manager - Organics
Senior Chemist - Food

Authorised results for

Inorganics
Organics
Organics



Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504953

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: 18-FEB-2015

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: **HK1504953**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction. Sample(s) were received in an ambient 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 D3974-09 based on ASTM D3974-09, prior to determination of metals.

Analysis of Tributyltin in interstitial water was cancelled due to insufficient volume of interstitial water except Sample #1 SD2 0M-0.9M, Sample #2 SD2 0.9M-1.9M and Sample #5 SD2 5.9M-6.9M.

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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Client sample ID

Compound	CAS Number	LOR	Unit	Client sampling date / time							
				SD2 0M-0.9M [04-FEB-2015] HK1504953-001	SD2 0.9M-1.9M [04-FEB-2015] HK1504953-002	SD2 1.9M-2.9M [04-FEB-2015] HK1504953-003	SD2 2.9M-3.9M [04-FEB-2015] HK1504953-004	SD2 5.9M-6.9M [04-FEB-2015] HK1504953-005			
EA/ED: Physical and Aggregate Properties											
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	57.3	47.7	43.8	39.7		12.2		
EG: Metals and Major Cations											
EG020: Arsenic	7440-38-2	1	mg/kg	9	12	6	6		16		
EG020: Cadmium	7440-43-9	0.2	mg/kg	0.3	<0.2	<0.2	<0.2		<0.2		
EG020: Chromium	7440-47-3	1	mg/kg	42	27	33	31		6		
EG020: Copper	7440-50-8	1	mg/kg	39	12	9	10		5		
EG020: Lead	7439-92-1	1	mg/kg	62	43	35	37		16		
EG020: Mercury	7439-97-6	0.05	mg/kg	0.06	<0.05	<0.05	<0.05		<0.05		
EG020: Nickel	7440-02-0	1	mg/kg	23	16	20	18		3		
EG020: Silver	7440-22-4	0.1	mg/kg	0.8	0.1	0.1	0.1		<0.1		
EG020: Zinc	7440-66-6	1	mg/kg	166	89	90	86		23		
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	35065-25-2	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	52663-66-0	3	µg/kg	<3	<3	<3	<3		<3		
Total Polychlorinated biphenyls	----	18	µg/kg	<18	<18	<18	<18		<18		
EP-076HK: 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		



Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Unit	Client sample ID								
				Client sampling date / time	SD2	SD2	SD2	SD2	SD2			
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued												
Anthracene	120-12-7	50	µg/kg	<50	<50	<50	<50	<50	<50	<50	<50	
Fluoranthene	206-44-0	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Pyrene	129-00-0	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Benz(a)anthracene	56-55-3	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Chrysene	218-019	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Indeno(1,2,3-cd)pyrene	193-39-5	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Dibenzo(a,h)anthracene	53-70-3	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Benzo(g,h,i)perylene	19124-2	150	µg/kg	<150	<150	<150	<150	<150	<150	<150	<150	
Low M.W. PAHs	----	550	µg/kg	<550	<550	<550	<550	<550	<550	<550	<550	
High M.W. PAHs	----	1700	µg/kg	<1700	<1700	<1700	<1700	<1700	<1700	<1700	<1700	
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates												
2-Fluorobiphenyl	32160-8	0.1	%	88.5	96.8	96.5	96.5	89.6	89.6	108	108	
4-Terphenyl-d14	1718-510	0.1	%	87.6	95.9	92.6	92.6	83.7	83.7	112	112	
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate												
Decachlorobiphenyl	205124-3	0.1	%	61.1	70.8	70.1	70.1	65.6	65.6	80.8	80.8	



Sub-Matrix: INTERSTITIAL WATER

Compound	CAS Number	LOR	Client sample ID		
			Client sampling date / time	Unit	µg TBT /L
EP-390: Triorganotins Tributyltin	56573-85-4	0.015	SD2 0M-0.9M [04-FEB-2015]	SD2 0.9M-1.9M [04-FEB-2015]	SD2 5.9M-6.9M [04-FEB-2015]
			HK1504953-001	HK1504953-002	HK1504953-005
			<0.015	<0.015	<0.015



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method : Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3819002)								
HK1504765-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	47.1	47.7	1.3
HK1504950-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	45.6	45.8	0.4
EG: Metals and Major Cations (QC Lot: 3819190)								
HK1504953-002	SD2 0.9M-1.9M	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Silver	7440-22-4	0.1	mg/kg	0.1	0.1	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	12	10	10.4
		EG020: Chromium	7440-47-3	1	mg/kg	27	26	0.0
		EG020: Copper	7440-50-8	1	mg/kg	12	12	0.0
		EG020: Lead	7439-92-1	1	mg/kg	43	43	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	16	16	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	89	84	6.0
HK1505107-004	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	0.1	0.1	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	16	16	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	23	23	0.0
		EG020: Copper	7440-50-8	1	mg/kg	10	10	0.0
		EG020: Lead	7439-92-1	1	mg/kg	26	27	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	16	16	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	63	62	0.0
EP-065: PCB Single Congeners (QC Lot: 3817752)								
HK1504765-001	Anonymous	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659)								



Matrix: SOIL		Laboratory Duplicate (DUP) Report		Laboratory Duplicate (DUP) Report		Laboratory Duplicate (DUP) Report		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659) - Continued								
HK1504792-002	Anonymous	High M.W. PAHs	-----	1700	µg/kg	<1700	<1700	0.0
		Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a,h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g,h,i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
		Low M.W. PAHs	-----	550	µg/kg	<550	<550	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3817754)								
HK1504953-002	SD2 0.9M-1.9M	Fluoranthene	206-44-0	150	µg/kg	<150	<150	0.0
		Pyrene	129-00-0	150	µg/kg	<150	<150	0.0
		Benzo(a)anthracene	56-55-3	150	µg/kg	<150	<150	0.0
		Chrysene	218-01-9	150	µg/kg	<150	<150	0.0
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	0.0
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	0.0
		Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	150	µg/kg	<150	<150	0.0
		Dibenz(a,h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g,h,i)perylene	191-24-2	150	µg/kg	<150	<150	0.0
		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	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-390: Triorganotins (QC Lot: 3821358)								
HK1504665-004	Anonymous	Tributyltin	56573-85-4	5	ngSn/L	<5	<5	0.0
Method Blank (MB), Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
Matrix: SOIL								
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
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			Recovery Limits (%)			RPD (%)	Control Limit
					LCS	DCS	Value	Low	High	Value		
EG: Metals and Major Cations (QC Lot: 3819190)												
EG020: Arsenic	7440-38-2	1	mg/kg	<1	96.1	---	76	112	---	---	---	
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	93.3	---	79	111	---	---	---	
EG020: Chromium	7440-47-3	1	mg/kg	<1	94.4	---	76	118	---	---	---	
EG020: Copper	7440-50-8	1	mg/kg	<1	102	---	79	105	---	---	---	
EG020: Lead	7439-92-1	1	mg/kg	<1	91.7	---	80	104	---	---	---	
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	77.9	---	76	112	---	---	---	
EG020: Nickel	7440-02-0	1	mg/kg	<1	99.1	---	79	105	---	---	---	
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	85.8	---	76	106	---	---	---	
EG020: Zinc	7440-66-6	1	mg/kg	<1	97.7	---	76	114	---	---	---	
EP-065: PCB Single Congeners (QC Lot: 3817752)												
PCB 8	34883-43-7	3	µg/kg	<3	93.4	---	41	126	---	---	---	
PCB 18	37680-65-2	3	µg/kg	<3	92.2	---	36	118	---	---	---	
PCB 28	7012-37-5	3	µg/kg	<3	97.4	---	35	119	---	---	---	
PCB 44	41464-39-5	3	µg/kg	<3	98.6	---	26	124	---	---	---	
PCB 52	35693-99-3	3	µg/kg	<3	99.6	---	26	124	---	---	---	
PCB 66	32598-10-0	3	µg/kg	<3	102	---	24	125	---	---	---	
PCB 77	32598-13-3	3	µg/kg	<3	102	---	51	122	---	---	---	
PCB 101	37680-73-2	3	µg/kg	<3	95.5	---	46	122	---	---	---	
PCB 105	32598-14-4	3	µg/kg	<3	99.3	---	52	122	---	---	---	
PCB 118	31508-00-6	3	µg/kg	<3	97.9	---	50	123	---	---	---	
PCB 126	57465-28-8	3	µg/kg	<3	103	---	53	121	---	---	---	
PCB 128	38380-07-3	3	µg/kg	<3	99.7	---	54	124	---	---	---	
PCB 138	35065-28-2	3	µg/kg	<3	97.3	---	51	123	---	---	---	
PCB 153	35065-27-1	3	µg/kg	<3	98.2	---	51	124	---	---	---	
PCB 169	32774-16-6	3	µg/kg	<3	101	---	55	126	---	---	---	
PCB 170	35065-30-6	3	µg/kg	<3	99.1	---	58	124	---	---	---	
PCB 180	35065-29-3	3	µg/kg	<3	99.4	---	56	126	---	---	---	
PCB 187	52663-68-0	3	µg/kg	<3	96.7	---	51	123	---	---	---	
Total Polychlorinated biphenyls	-----	18	µg/kg	<18	-----	-----	-----	-----	-----	-----	-----	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659)												
Naphthalene	91-20-3	25	µg/kg	<50	97.4	---	68	107	---	---	---	
Acenaphthylene	208-96-8	25	µg/kg	<50	97.5	---	70	113	---	---	---	
Acenaphthene	83-32-9	25	µg/kg	<50	96.4	---	68	108	---	---	---	
Fluorene	86-73-7	25	µg/kg	<50	106	---	71	111	---	---	---	
Phenanthrene	85-01-8	25	µg/kg	<50	107	---	71	110	---	---	---	
Anthracene	120-12-7	25	µg/kg	<50	103	---	63	117	---	---	---	
Fluoranthene	206-44-0	25	µg/kg	<50	108	---	72	113	---	---	---	
Pyrene	129-00-0	25	µg/kg	<50	111	---	72	112	---	---	---	
Benz(a)anthracene	56-55-3	25	µg/kg	<50	113	---	70	119	---	---	---	
Chrysene	218-01-9	25	µg/kg	<50	111	---	79	112	---	---	---	
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	114	---	68	125	---	---	---	
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	104	---	75	113	---	---	---	
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	114	---	64	118	---	---	---	



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	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3815659) - Continued														
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	100			61	127				
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	88.8			66	112				
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	111			73	114				
Low M.W. PAHs		550	µg/kg	<550										
High M.W. PAHs		1700	µg/kg	<1700										
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3817754)														
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	89.3			68	107				
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	86.0			70	113				
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	95.5			68	108				
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	103			71	111				
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	102			71	110				
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	101			63	117				
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	108			72	113				
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	108			72	112				
Benzo(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	96.8			70	119				
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	93.2			79	112				
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	85.3			68	125				
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	87.6			75	113				
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	70.8			64	118				
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	66.5			61	127				
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	68.3			66	112				
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	73.4			73	114				
Low M.W. PAHs		550	µg/kg	<550										
High M.W. PAHs		1700	µg/kg	<1700										
Matrix: WATER														
Method Blank (MB) Report														
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-390: Triorganotins (QC Lot: 3821358)	56573-85-4	5	ngSn/L	<5	2 ngSn/L	97.6			70	130				
Tributyltin														



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	MS	MSD	Recovery Limits (%)	RPD (%)	
EG: Metals and Major Cations (QC Lot: 3819190)									
HK1504953-001	SD2 0M-0.9M	EG020: Arsenic	7440-38-2	5 mg/kg	89.5	-----	75	125	-----
		EG020: Cadmium	7440-43-9	5 mg/kg	94.0	-----	75	125	-----
		EG020: Chromium	7440-47-3	50 mg/kg	95.0	-----	75	125	-----
		EG020: Copper	7440-50-8	50 mg/kg	97.7	-----	75	125	-----
		EG020: Lead	7439-92-1	50 mg/kg	90.8	-----	75	125	-----
		EG020: Mercury	7439-97-6	0.1 mg/kg	84.2	-----	75	125	-----
		EG020: Nickel	7440-02-0	50 mg/kg	94.2	-----	75	125	-----
		EG020: Silver	7440-22-4	5 mg/kg	84.8	-----	75	125	-----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	-----	75	125	-----

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
				Spike Concentration	MS	MSD	Recovery Limits (%)	RPD (%)	
HK1504665-004	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	96.8	-----	70	130	-----

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

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ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 5
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1504954
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Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 04-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 25-FEB-2015
C-O-C number	: H026568			No. of samples received	: 5
Site	: ----			No. of samples analysed	: 5

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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.

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Page Number : 2 of 5
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504954

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: 18-FEB-2015

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: **HK1504954**

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

Sample #5 required dilution prior to ammonia analysis due to matrix interference. LOR values have been adjusted accordingly.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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



Analytical Results

Sub-Matrix: SEDIMENT

Client sample ID

Compound	CAS Number	LOR	Client sampling date / time		Unit	%	SD2	SD2	SD2	SD2	SD2	SD2
			0M-0.9M	0.9M-1.9M			1.9M-2.9M	2.9M-3.9M	5.9M-6.9M			
EA/ED: Physical and Aggregate Properties												
EA055: Moisture Content (dried @ 103° C)												
	----	0.1	57.3	47.7	43.8	39.7						12.2
ED/EK: Inorganic Nonmetallic Parameters												
EK055: Ammonia as N	7664-417	0.1	13.6	8.0	5.7	4.2						<1.0
EK057A: Nitrite as N (Sol.)	----	0.1	<0.1	<0.1	<0.1	<0.1						<0.1
EK058A: Nitrate as N (Sol.)	----	0.1	<0.1	<0.1	<0.1	<0.1						<0.1
EK061A: Total Kjeldahl Nitrogen as N	----	1	1400	853	941	702						38
EK067A: Total Phosphorus as P	----	1	454	490	391	455						252
EP-067_SR-A: Organochlorine Pesticides (OC)												
alpha-BHC	319-84-6	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
beta-BHC	319-85-7	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
gamma-BHC	58-89-9	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
delta-BHC	319-86-8	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
Heptachlor	76-44-8	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
Aldrin	309-00-2	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
Heptachlor epoxide	1024-57-3	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
Endosulfan 1	959-98-8	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
4,4'-DDE	72-55-9	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
4,4'-DDD	72-54-8	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
Endosulfan sulfate	1031-07-8	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
4,4'-DDT	50-29-3	0.50	<0.50	<0.50	<0.50	<0.50						<0.50
EP-067_SR-S: Pesticide Surrogate												
Tetrachlorometaxylene	877-09-8	0.1	78.4	78.6	81.8	74.6						88.8
Dibutylchlorendate	1770-80-5	0.1	66.4	65.4	60.4	59.0						71.6

Surrogate control limits listed at end of this report.



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Laboratory Duplicate (DUP) Report			RPD (%)
					Unit	Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3818994)								
HK1504839-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	47.1	47.7	1.3
HK1504951-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	45.6	45.8	0.4
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)								
HK1504844-001	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	1510	1470	3.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)								
HK1504839-001	Anonymous	EK067A: Total Phosphorus as P	----	1	mg/kg	558	520	7.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825432)								
HK1504161-001	Anonymous	EK055: Ammonia as N	7664-41-7	10	mg/kg	<10	<10	0.0
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3817759)								
HK1504839-001	Anonymous	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	0.0
		beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	0.0
		gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	0.0
		delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	0.0
		Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	0.0

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

Method: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report			
					Spike Concentration	Spike Recovery (%)	LCS	DCS	Recovery Limits (%)	Value	Control Limit	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3818998)												
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	2 mg/kg	107	-----	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)												
EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	104	-----	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)												
EK067A: Total Phosphorus as P	----	20	mg/kg	<20	695 mg/kg	90.9	-----	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825432)												
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	98.2	-----	89	113	-----	-----	-----
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3817759)												
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	78.8	-----	55	106	-----	-----	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	76.6	-----	37	123	-----	-----	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	78.2	-----	43	112	-----	-----	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	80.0	-----	64	113	-----	-----	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	83.8	-----	42	113	-----	-----	-----



Method: Compound	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report									
	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
	EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3817759) - Continued													
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	89.2	-----	-----	57	106	-----	-----	-----	-----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	76.4	-----	-----	61	108	-----	-----	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	74.2	-----	-----	55	120	-----	-----	-----	-----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	78.2	-----	-----	60	116	-----	-----	-----	-----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	70.6	-----	-----	52	127	-----	-----	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	72.6	-----	-----	56	120	-----	-----	-----	-----
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	75.8	-----	-----	45	126	-----	-----	-----	-----

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

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

Surrogate Control Limits

Sub-Matrix: SEDIMENT	Compound	CAS Number	Recovery Limits (%)	
			Low	High
EP-067_SR-S: Pesticide Surrogate				
	Tetrachlorometaxylene	877-09-8	50	130
	Dibutylchlorendate	1770-80-5	50	130

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

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Project : AGREEMENT NO CE63_2012 (DS)
EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026571
Site : ----

Laboratory : ALS Technichem HK Pty Ltd
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Quote number : HK/1393/2014

Page : 1 of 10
Work Order : HK1504955

Date Samples Received : 04-FEB-2015
Issue Date : 25-FEB-2015
No. of samples received : 2
No. of samples analysed : 2

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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.

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Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504955

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: 18-FEB-2015

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: **HK1504955**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.
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 D3974-09 based on ASTM D3974-09, prior to 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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		Unit
			Client sampling date / time	Client sample ID	
EA/ED: Physical and Aggregate Properties					
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	53.2	51.4
EG: Metals and Major Cations					
EG020: Arsenic	7440-38-2	1	mg/kg	10	14
EG020: Cadmium	7440-43-9	0.2	mg/kg	0.3	0.2
EG020: Chromium	7440-47-3	1	mg/kg	38	17
EG020: Copper	7440-50-8	1	mg/kg	37	38
EG020: Lead	7439-92-1	1	mg/kg	54	47
EG020: Mercury	7439-97-6	0.05	mg/kg	0.06	0.07
EG020: Nickel	7440-02-0	1	mg/kg	24	10
EG020: Silver	7440-22-4	0.1	mg/kg	0.9	0.7
EG020: Zinc	7440-66-6	1	mg/kg	157	134
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-076HK: 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



Sub-Matrix: SEDIMENT

Compound	Client sample ID		GB3	GB8
	CAS Number	Client sampling date / lime		
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued				
Fluoranthene	206-44-0	150	<150	<150
Pyrene	129-00-0	150	<150	<150
Benz(a)anthracene	56-55-3	150	<150	<150
Chrysene	218-01-9	150	<150	<150
Benzo(b)fluoranthene	205-99-2	150	<150	<150
Benzo(k)fluoranthene	207-08-9	150	<150	<150
Benzo(a)pyrene	50-32-8	150	<150	<150
Indeno(1,2,3-cd)pyrene	193-39-5	150	<150	<150
Dibenz(a,h)anthracene	53-70-3	150	<150	<150
Benzo(g,h,i)perylene	191-24-2	150	<150	<150
Low M.W. PAHs	----	550	<550	<550
High M.W. PAHs	----	1700	<1700	<1700
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates				
2-Fluorobiphenyl	32160-8	0.1	91.8	96.5
4-Terphenyl-d14	1718-510	0.1	87.6	88.3
EP-066S: PCB Congeners and Organochlorine Pesticides Surrogate				
Decachlorobiphenyl	205124-3	0.1	73.7	52.2
Surrogate control limits listed at end of this report.				
Surrogate control limits listed at end of this report.				



Sub-Matrix: INTERSTITIAL WATER

Compound	CAS Number	LOR	Client sample ID	
			Client sampling date / time	Unit
EP-390: Triorganotin			GB3	GB8
			[04-FEB-2015] HK1504955-001	[04-FEB-2015] HK1504955-002
Tributyltin	56573-85-4	0.015	<0.015	<0.015



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3819002)								
HK1504765-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	47.1	47.7	1.3
HK1504950-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	45.6	45.8	0.4
EA/ED: Physical and Aggregate Properties (QC Lot: 3819003)								
HK1504955-002	GB8	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	51.4	51.6	0.4
HK1505113-003	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	42.3	41.6	1.6
EG: Metals and Major Cations (QC Lot: 3819190)								
HK1504953-002	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	0.1	0.1	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	12	10	10.4
		EG020: Chromium	7440-47-3	1	mg/kg	27	26	0.0
		EG020: Copper	7440-50-8	1	mg/kg	12	12	0.0
		EG020: Lead	7439-92-1	1	mg/kg	43	43	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	16	16	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	89	84	6.0
HK1505107-004	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	0.1	0.1	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	16	16	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	23	23	0.0
		EG020: Copper	7440-50-8	1	mg/kg	10	10	0.0
		EG020: Lead	7439-92-1	1	mg/kg	26	27	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	16	16	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	63	62	0.0
EP-065: PCB Single Congeners (QC Lot: 3817752)								
HK1504765-001	Anonymous	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



Matrix: SOIL		Method: Compound		Laboratory Duplicate (DUP) Report			
Laboratory sample ID	Client sample ID	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-065: PCB Single Congeners (QC Lot: 3817752) - Continued							
HK1504765-001	Anonymous	35065-29-3	3	µg/kg	<3	<3	0.0
		52663-68-0	3	µg/kg	<3	<3	0.0
EP-065: PCB Single Congeners (QC Lot: 3817755)							
HK1504955-002	GB8	-----	18	µg/kg	<18	<18	0.0
Total Polychlorinated biphenyls							
		34883-43-7	3	µg/kg	<3	<3	0.0
		37680-65-2	3	µg/kg	<3	<3	0.0
		7012-37-5	3	µg/kg	<3	<3	0.0
		41464-39-5	3	µg/kg	<3	<3	0.0
		35693-99-3	3	µg/kg	<3	<3	0.0
		32598-10-0	3	µg/kg	<3	<3	0.0
		32598-13-3	3	µg/kg	<3	<3	0.0
		37680-73-2	3	µg/kg	<3	<3	0.0
		32598-14-4	3	µg/kg	<3	<3	0.0
		31508-00-6	3	µg/kg	<3	<3	0.0
		57465-28-8	3	µg/kg	<3	<3	0.0
		38380-07-3	3	µg/kg	<3	<3	0.0
		35065-28-2	3	µg/kg	<3	<3	0.0
		35065-27-1	3	µg/kg	<3	<3	0.0
		32774-16-6	3	µg/kg	<3	<3	0.0
		35065-30-6	3	µg/kg	<3	<3	0.0
		35065-29-3	3	µg/kg	<3	<3	0.0
		52663-68-0	3	µg/kg	<3	<3	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3817754)							
HK1504953-002	Anonymous	206-44-0	150	µg/kg	<150	<150	0.0
		129-00-0	150	µg/kg	<150	<150	0.0
		56-55-3	150	µg/kg	<150	<150	0.0
		218-01-9	150	µg/kg	<150	<150	0.0
		205-99-2	150	µg/kg	<150	<150	0.0
		207-08-9	150	µg/kg	<150	<150	0.0
		50-32-8	150	µg/kg	<150	<150	0.0
		193-39-5	150	µg/kg	<150	<150	0.0
		53-70-3	150	µg/kg	<150	<150	0.0
		191-24-2	150	µg/kg	<150	<150	0.0
		-----	1700	µg/kg	<1700	<1700	0.0
		91-20-3	50	µg/kg	<50	<50	0.0
		208-96-8	50	µg/kg	<50	<50	0.0
		83-32-9	50	µg/kg	<50	<50	0.0
		86-73-7	50	µg/kg	<50	<50	0.0
		85-01-8	50	µg/kg	<50	<50	0.0
		120-12-7	50	µg/kg	<50	<50	0.0
		-----	550	µg/kg	<550	<550	0.0
Matrix: WATER							
Laboratory sample ID	Client sample ID	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
Method: Compound							



Matrix: WATER		Method: Compound		Laboratory Duplicate (DUP) Report	
Laboratory sample ID	Client sample ID	CAS Number	LOR	Unit	RPD (%)
EP-390: Triorganotins (QC Lot: 3821358)					
HK1504955-004	Anonymous	56573-85-4	5	ngSn/L	<5
Method Blank (MB), 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 (%)		DCS	Recovery Limits (%)		Value	RPD (%)
					LCS	DCS	Low	High					
EG: Metals and Major Cations (QC Lot: 3819190)													
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	96.1	76	112	-----	76	112	-----	-----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	93.3	79	111	-----	79	111	-----	-----
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	94.4	76	118	-----	76	118	-----	-----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	102	79	105	-----	79	105	-----	-----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	91.7	80	104	-----	80	104	-----	-----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	77.9	76	112	-----	76	112	-----	-----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	99.1	79	105	-----	79	105	-----	-----
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	85.8	76	106	-----	76	106	-----	-----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	97.7	76	114	-----	76	114	-----	-----
EP-065: PCB Single Congeners (QC Lot: 3817752)													
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	93.4	41	126	-----	41	126	-----	-----
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	92.2	36	118	-----	36	118	-----	-----
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	97.4	35	119	-----	35	119	-----	-----
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	98.6	26	124	-----	26	124	-----	-----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	99.6	26	124	-----	26	124	-----	-----
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	102	24	125	-----	24	125	-----	-----
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	102	51	122	-----	51	122	-----	-----
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	95.5	46	122	-----	46	122	-----	-----
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	99.3	52	122	-----	52	122	-----	-----
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	97.9	50	123	-----	50	123	-----	-----
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	103	53	121	-----	53	121	-----	-----
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	99.7	54	124	-----	54	124	-----	-----
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	97.3	51	123	-----	51	123	-----	-----
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	98.2	51	124	-----	51	124	-----	-----
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	101	55	126	-----	55	126	-----	-----
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	99.1	58	124	-----	58	124	-----	-----
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	99.4	56	126	-----	56	126	-----	-----
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	96.7	51	123	-----	51	123	-----	-----
Total Polychlorinated biphenyls	-----	18	µg/kg	<18	-----	-----	-----	-----	-----	-----	-----	-----	-----
EP-065: PCB Single Congeners (QC Lot: 3817755)													
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	84.0	41	126	-----	41	126	-----	-----
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	83.4	36	118	-----	36	118	-----	-----
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	84.8	35	119	-----	35	119	-----	-----
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	88.5	26	124	-----	26	124	-----	-----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	87.2	26	124	-----	26	124	-----	-----
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	91.1	24	125	-----	24	125	-----	-----
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	79.4	51	122	-----	51	122	-----	-----



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 (%)	DCS	Recovery Limits (%)	RPD (%)
EP-065: PCB Single Congeners (QC Lot: 3817755) - Continued									
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	78.3		46	122
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	79.2		52	122
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	78.4		50	123
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	82.3		53	121
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	81.5		54	124
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	78.9		51	123
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	78.2		51	124
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	83.2		55	126
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	85.5		58	124
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	84.0		56	126
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	80.6		51	123
Total Polychlorinated biphenyls		18	µg/kg	<18					
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3817754)									
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	89.3		68	107
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	86.0		70	113
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	95.5		68	108
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	103		71	111
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	102		71	110
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	101		63	117
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	108		72	113
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	108		72	112
Benzo(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	96.8		70	119
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	93.2		79	112
Benzo(k)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	85.3		68	125
Benzo(a)pyrene	207-08-9	25	µg/kg	<50	500 µg/kg	87.6		75	113
Indeno(1,2,3-cd)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	70.8		64	118
Dibenz(a,h)anthracene	193-39-5	25	µg/kg	<50	500 µg/kg	66.5		61	127
Benzo(g,h,i)perylene	53-70-3	25	µg/kg	<50	500 µg/kg	68.3		66	112
Low M.W. PAHs	191-24-2	25	µg/kg	<50	500 µg/kg	73.4		73	114
High M.W. PAHs		550	µg/kg	<550					
		1700	µg/kg	<1700					
Matrix: WATER									
Matrix: WATER		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 (%)	DCS	Recovery Limits (%)	RPD (%)
EP-390: Triorganotins (QC Lot: 3821358)									
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	97.6		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	MS	MSD	Recovery Limits (%)	RPD (%)	
EG: Metals and Major Cations (QC Lot: 3819190)									
HK1504953-001	Anonymous								
		EG020: Arsenic	7440-39-2	5 mg/kg	89.5	-----	75	125	-----
		EG020: Cadmium	7440-43-9	5 mg/kg	94.0	-----	75	125	-----
		EG020: Chromium	7440-47-3	50 mg/kg	95.0	-----	75	125	-----
		EG020: Copper	7440-50-8	50 mg/kg	97.7	-----	75	125	-----
		EG020: Lead	7439-92-1	50 mg/kg	90.8	-----	75	125	-----
		EG020: Mercury	7439-97-6	0.1 mg/kg	84.2	-----	75	125	-----
		EG020: Nickel	7440-02-0	50 mg/kg	94.2	-----	75	125	-----
		EG020: Silver	7440-22-4	5 mg/kg	84.8	-----	75	125	-----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	-----	75	125	-----

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
				Spike Concentration	MS	MSD	Recovery Limits (%)	RPD (%)	
HK1504665-004	Anonymous								
		Tributyltin	56573-85-4	2 ngSn/L	96.8	-----	70	130	-----

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
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

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Project : AGREEMENT NO CE63_2012 (DS)
EXPANSION OF SHA TAU KOK SEWAGE
TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026572
Site : ----

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Quote number : HK/1393/2014

Page : 1 of 6
Work Order : HK1504956

Date Samples Received : 04-FEB-2015
Issue Date : 25-FEB-2015
No. of samples received : 2
No. of samples analysed : 2

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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

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Manager - Organics
General Manager

Authorised results for

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Inorganics

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Page Number : 2 of 6
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504956

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: 18-FEB-2015

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: **HK1504956**

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

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

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.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time		Unit	GB3	GB8
			Client sample ID	Client sampling date / time			
EA/ED: Physical and Aggregate Properties							
EA055: Moisture Content (dried @ 103° C)	----	0.1	%		53.2	51.4	
ED/EK: Inorganic Nonmetallic Parameters							
EK055: Ammonia as N	7664-417	0.1	mg/kg		9.3	5.0	
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg		<0.1	<0.1	
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg		<0.1	<0.1	
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg		1600	1260	
EK067A: Total Phosphorus as P	----	1	mg/kg		557	415	
EP-067_SR-A: Organochlorine Pesticides (OC)							
alpha-BHC	319-84-6	0.50	mg/kg		<0.50	<0.50	
beta-BHC	319-85-7	0.50	mg/kg		<0.50	<0.50	
gamma-BHC	58-89-9	0.50	mg/kg		<0.50	<0.50	
delta-BHC	319-86-8	0.50	mg/kg		<0.50	<0.50	
Heptachlor	76-44-8	0.50	mg/kg		<0.50	<0.50	
Aldrin	309-00-2	0.50	mg/kg		<0.50	<0.50	
Heptachlor epoxide	1024-57-3	0.50	mg/kg		<0.50	<0.50	
Endosulfan 1	959-98-8	0.50	mg/kg		<0.50	<0.50	
4,4'-DDE	72-55-9	0.50	mg/kg		<0.50	<0.50	
4,4'-DDD	72-54-8	0.50	mg/kg		<0.50	<0.50	
Endosulfan sulfate	1031-07-8	0.50	mg/kg		<0.50	<0.50	
4,4'-DDT	50-29-3	0.50	mg/kg		<0.50	<0.50	
EP-067_SR-S: Pesticide Surrogate							
Tetrachlorometaxylene	877-09-8	0.1	%		76.6	78.0	
Dibutylchlorendate	1770-80-5	0.1	%		63.4	64.0	
Surrogate control limits listed at end of this report.							



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3818994)								
HK1504839-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	47.1	47.7	1.3
HK1504951-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	45.6	45.8	0.4
EA/ED: Physical and Aggregate Properties (QC Lot: 3818995)								
HK1504956-002	GB8	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	51.4	51.6	0.4
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)								
HK1504844-001	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	1510	1470	3.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)								
HK1504839-001	Anonymous	EK067A: Total Phosphorus as P	----	1	mg/kg	558	520	7.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824828)								
HK1504954-001	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	1400	1300	7.6
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824829)								
HK1505110-001	Anonymous	EK067A: Total Phosphorus as P	----	1	mg/kg	472	464	1.6
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825433)								
HK1504956-001	GB3	EK055: Ammonia as N	7664-41-7	0.1	mg/kg	9.3	10.3	10.4
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3817759)								
HK1504839-001	Anonymous	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	0.0
		beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	0.0
		gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	0.0
		delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	0.0
		Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	0.0
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3817760)								
HK1504956-002	GB8	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	0.0
		beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	0.0
		gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	0.0
		delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	0.0
		Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	0.0



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	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3818998)												
EK057A: Nitrite as N(Sol.)	-----	0.1	mg/kg	<0.1	2 mg/kg	107	-----	-----	85	115	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3819000)												
EK057A: Nitrite as N(Sol.)	-----	0.1	mg/kg	<0.1	2 mg/kg	105	-----	-----	85	115	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824826)												
EK061A: Total Kjeldahl Nitrogen as N	-----	20	mg/kg	<20	1000 mg/kg	104	-----	-----	85	115	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824827)												
EK067A: Total Phosphorus as P	-----	20	mg/kg	<20	695 mg/kg	90.9	-----	-----	85	115	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824828)												
EK061A: Total Kjeldahl Nitrogen as N	-----	20	mg/kg	<20	1000 mg/kg	103	-----	-----	85	115	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824829)												
EK067A: Total Phosphorus as P	-----	20	mg/kg	<20	695 mg/kg	92.8	-----	-----	85	115	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825433)												
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	97.8	-----	-----	89	113	-----	-----
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3817759)												
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	78.8	-----	-----	55	106	-----	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	76.6	-----	-----	37	123	-----	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	78.2	-----	-----	43	112	-----	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	80.0	-----	-----	64	113	-----	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	83.8	-----	-----	42	113	-----	-----
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	89.2	-----	-----	57	106	-----	-----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	76.4	-----	-----	61	108	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	74.2	-----	-----	55	120	-----	-----
4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	78.2	-----	-----	60	116	-----	-----
4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	70.6	-----	-----	52	127	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	72.6	-----	-----	56	120	-----	-----
4.4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	75.8	-----	-----	45	126	-----	-----
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3817760)												
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	73.4	-----	-----	55	106	-----	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	68.6	-----	-----	37	123	-----	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	68.8	-----	-----	43	112	-----	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	93.4	-----	-----	64	113	-----	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	67.4	-----	-----	42	113	-----	-----
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	101	-----	-----	57	106	-----	-----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	77.0	-----	-----	61	108	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	86.6	-----	-----	55	120	-----	-----
4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	91.8	-----	-----	60	116	-----	-----
4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	94.0	-----	-----	52	127	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	84.0	-----	-----	56	120	-----	-----
4.4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	59.8	-----	-----	45	126	-----	-----



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

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

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130



CERTIFICATE OF ANALYSIS

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Project : AGREEMENT NO CE63_2012 (DS)
EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026569-H026570
Site : ----

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Quote number : HK/1393/2014

Page : 1 of 14
Work Order : HK1504957

Date Samples Received : 04-FEB-2015
Issue Date : 26-FEB-2015
No. of samples received : 6
No. of samples analysed : 6

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics



Page Number : 2 of 14
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504957

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: 23-FEB-2015

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: **HK1504957**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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

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

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



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID						
			Client sampling date / time	SD2	SD2	SD2	SD2	SD2	
	Unit								
EP-390: Triorganotin	56573-85-4	0.015	0M-0.9M [04-FEB-2015] HK1504957-001	0.9M-1.9M [04-FEB-2015] HK1504957-002	1.9M-2.9M [04-FEB-2015] HK1504957-003	2.9M-3.9M [04-FEB-2015] HK1504957-004	5.9M-6.9M [04-FEB-2015] HK1504957-005		
Tributyltin			<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015



Page Number : 4 of 14
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504957

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time	Unit	Client sample ID
EP-390: Triorganotins	56573-85-4	0.015			SD2
Tributyltin					ELUTRIATE BLK [04-FEB-2015]
					HK1504957-006
					<0.015



Compound	CAS Number	LOR	Unit	Client sample ID						
				SD2 0M-0.9M [04-FEB-2015] HK1504957-001	SD2 0.9M-1.9M [04-FEB-2015] HK1504957-002	SD2 1.9M-2.9M [04-FEB-2015] HK1504957-003	SD2 2.9M-3.9M [04-FEB-2015] HK1504957-004	SD2 5.9M-6.9M [04-FEB-2015] HK1504957-005		
ED/EK: Inorganic Nonmetallic Parameters										
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.66	0.63	0.54	0.43	0.11		
EK057A: Nitrite as N	----	0.01	mg/L	0.02	0.03	<0.01	0.01	<0.01		
EK058A: Nitrate as N	14797-55-8	0.01	mg/L	0.08	0.08	0.09	0.13	0.14		
EK061P: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.7	1.3	1.0	0.9	0.4		
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.12	0.25	0.12	0.10	0.02		
EK071K: Reactive Phosphorus as P	14265-44-2	10	µg/L	80	210	90	70	<10		
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	2	2	2	1	2		
EG020: Lead	7439-92-1	1	µg/L	<1	<1	<1	<1	<1		
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5		
EG020: Nickel	7440-02-0	1	µg/L	<1	2	<1	<1	1		
EG020: Silver	7440-22-4	1	µg/L	2	<1	<1	<1	<1		
EG020: Zinc	7440-66-6	10	µg/L	<10	<10	<10	<10	<10		
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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	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		
PCB 153	35065-27-1	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 180	35065-29-3	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		
Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18		
EP-076HK: Polycyclic Aromatic 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		



Compound	CAS Number	LOR	Unit	Client sample ID					SD2	SD2	SD2	SD2	SD2
				0M-0.9M [04-FEB-2015] HK1504957-001	0.9M-1.9M [04-FEB-2015] HK1504957-002	1.9M-2.9M [04-FEB-2015] HK1504957-003	2.9M-3.9M [04-FEB-2015] HK1504957-004	5.9M-6.9M [04-FEB-2015] HK1504957-005					
Sub-Matrix: ELUTRIATE													
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued													
Acenaphthene	83-32-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<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	<0.2	<0.2	<0.2	<0.2	
Phenanthrene	85-018	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<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	<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	<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	<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	<0.2	<0.2	<0.2	<0.2	
Chrysene	218-019	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<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	<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	<0.2	<0.2	<0.2	<0.2	
Benzo(g,h,i)perylene	19124-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<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	<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	<6.8	<6.8	<6.8	<6.8	
EP-067_SR-A: Organochlorine Pesticides (OC)													
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates													
2-Fluorobiphenyl	32160-8	0.1	%	52.6	50.4	52.0	60.2	64.6	60.2	64.6	60.2	64.6	
4-Terphenyl-d14	1718-510	0.1	%	108	78.2	81.6	94.9	104	94.9	104	94.9	104	
EP-066S: PCB Congeners and Organochlorine Pesticides Surrogate													
Decachlorobiphenyl	205124-3	0.1	%	71.5	72.4	81.6	65.8	50.5	65.8	50.5	65.8	50.5	
EP-067_SR-S: Pesticide Surrogate													
Tetrachlorometaxylene	877-09-8	0.1	%	54.0	53.4	52.2	54.4	60.4	54.4	60.4	54.4	60.4	
Dibutylchlorodate	1770-80-5	0.1	%	93.0	62.0	86.4	67.0	68.8	67.0	68.8	67.0	68.8	



Compound	Client sample ID		LOR	Unit	SD2 ELUTRIATE BLK [04-FEB-2015] HK1504957-006
	CAS Number	Client sampling date / time			
ED/EK: Inorganic Nonmetallic Parameters					
EK055K: Ammonia as N	7664-417		0.01	mg/L	0.03
EK057A: Nitrite as N	----		0.01	mg/L	<0.01
EK058A: Nitrate as N	14797-55-8		0.01	mg/L	0.10
EK061P: Total Kjeldahl Nitrogen as N	----		0.1	mg/L	0.6
EK067P: Total Phosphorus as P	----		0.01	mg/L	0.04
EK071K: Reactive Phosphorus as P	14265-44-2		10	µg/L	<10
EG: Metals and Major Cations - Filtered					
EG020: Arsenic	7440-38-2		10	µg/L	<10
EG020: Cadmium	7440-43-9		0.2	µg/L	<0.2
EG020: Chromium	7440-47-3		1	µg/L	<1
EG020: Copper	7440-50-8		1	µg/L	3
EG020: Lead	7439-92-1		1	µg/L	<1
EG020: Mercury	7439-97-6		0.5	µg/L	<0.5
EG020: Nickel	7440-02-0		1	µg/L	<1
EG020: Silver	7440-22-4		1	µg/L	<1
EG020: Zinc	7440-66-6		10	µg/L	11
EP-065A: PCB Single Congeners					
PCB 8	34883-43-7		0.01	µg/L	<0.01
PCB 18	37680-65-2		0.01	µg/L	<0.01
PCB 28	7012-37-5		0.01	µg/L	<0.01
PCB 44	41464-39-5		0.01	µg/L	<0.01
PCB 52	35693-99-3		0.01	µg/L	<0.01
PCB 66	32598-10-0		0.01	µg/L	<0.01
PCB 77	32598-13-3		0.01	µg/L	<0.01
PCB 101	37680-73-2		0.01	µg/L	<0.01
PCB 105	32598-14-4		0.01	µg/L	<0.01
PCB 118	31508-00-6		0.01	µg/L	<0.01
PCB 126	57465-28-8		0.01	µg/L	<0.01
PCB 128	38380-07-3		0.01	µg/L	<0.01
PCB 138	35065-28-2		0.01	µg/L	<0.01
PCB 153	35065-27-1		0.01	µg/L	<0.01
PCB 169	32774-16-6		0.01	µg/L	<0.01
PCB 170	35065-30-6		0.01	µg/L	<0.01
PCB 180	35065-29-3		0.01	µg/L	<0.01
PCB 187	52663-68-0		0.01	µg/L	<0.01
Total Polychlorinated biphenyls	----		0.18	µg/L	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	91-20-3		0.2	µg/L	<0.2
Acenaphthylene	208-96-8		0.2	µg/L	<0.2



Compound	Client sample ID			SD2
	CAS Number	LOR	Unit	
Sub-Matrix: ELUTRIATE				
ELUTRIATE BLK				
[04-FEB-2015]				
HK1504957-006				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued				
Acenaphthene	83-32-9	0.2	µg/L	<0.2
Fluorene	86-73-7	0.2	µg/L	<0.2
Phenanthrene	85-01-8	0.2	µg/L	<0.2
Anthracene	120-12-7	0.2	µg/L	<0.2
Fluoranthene	206-44-0	0.2	µg/L	<0.2
Pyrene	129-00-0	0.2	µg/L	<0.2
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2
Chrysene	218-01-9	0.2	µg/L	<0.2
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2
Low M.W. PAHs	----	2.2	µg/L	<2.2
High M.W. PAHs	----	6.8	µg/L	<6.8
EP-067_SR-A: Organichlorine Pesticides (OC)				
alpha-BHC	319-84-6	0.1	µg/L	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1
Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates				
2-Fluorobiphenyl	321-60-8	0.1	%	52.7
4-Terphenyl-d14	1718-51-0	0.1	%	108
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate				
Decachlorobiphenyl	2051-24-3	0.1	%	68.8
EP-067_SR-S: Pesticide Surrogate				
Tetrachlorometaxylene	877-09-8	0.1	%	55.2
Dibutylchlorendate	1770-80-5	0.1	%	74.8

Surrogate control limits listed at end of this report.

Surrogate control limits listed at end of this report.

Surrogate control limits listed at end of this report.



Laboratory Duplicate (DUP) Report

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
							Original Result	Duplicate Result	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)									
HK1505116-005	Anonymous		EK057A: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)									
HK1504952-001	Anonymous		EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.96	0.91	5.3
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)									
HK1504949-001	Anonymous		EK067P: Total Phosphorus as P	----	0.01	mg/L	0.06	0.05	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)									
HK1504948-001	Anonymous		EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.17	0.17	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)									
SD2 0.9M-1.9M									
HK1504957-002			EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
			EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
			EG020: Chromium	7440-47-3	1	µg/L	<1	<1	0.0
			EG020: Copper	7440-50-8	1	µg/L	2	1	0.0
			EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
			EG020: Nickel	7440-02-0	1	µg/L	2	2	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
			EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
			EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
			EG020: Chromium	7440-47-3	1	µg/L	<1	<1	0.0
			EG020: Copper	7440-50-8	1	µg/L	2	2	0.0
			EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
			EG020: Nickel	7440-02-0	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	20	20	0.0
			EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
EP-065A: PCB Single Congeners (QC Lot: 3828441)									
SD2 ELUTRIATE BLK									
HK1504957-006			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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
			PCB 138	35065-28-2	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 169	32774-16-6	0.01	µg/L	<0.01	<0.01	0.0



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504957

Matrix: WATER		Method: Compound		Laboratory Duplicate (DUP) Report		RPD (%)	
Laboratory sample ID	Client sample ID	CAS Number	LOR	Unit	Original Result	Duplicate Result	
EP-065A: PCB Single Congeners (QC Lot: 3828441) - Continued							
HK1504957-006	SD2 ELUTRIATE BLK	35065-30-6	0.01	µg/L	<0.01	<0.01	0.0
		35065-29-3	0.01	µg/L	<0.01	<0.01	0.0
		52663-68-0	0.01	µg/L	<0.01	<0.01	0.0
		-----	0.18	µg/L	<0.18	<0.18	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824764)							
HK1505116-005	Anonymous	91-20-3	0.2	µg/L	<0.2	<0.2	0.0
		208-96-8	0.2	µg/L	<0.2	<0.2	0.0
		83-32-9	0.2	µg/L	<0.2	<0.2	0.0
		86-73-7	0.2	µg/L	<0.2	<0.2	0.0
		85-01-8	0.2	µg/L	<0.2	<0.2	0.0
		120-12-7	0.2	µg/L	<0.2	<0.2	0.0
		206-44-0	0.2	µg/L	<0.2	<0.2	0.0
		129-00-0	0.2	µg/L	<0.2	<0.2	0.0
		56-55-3	0.2	µg/L	<0.2	<0.2	0.0
		218-01-9	0.2	µg/L	<0.2	<0.2	0.0
		205-99-2	0.2	µg/L	<0.2	<0.2	0.0
		207-08-9	0.2	µg/L	<0.2	<0.2	0.0
		50-32-8	0.2	µg/L	<0.2	<0.2	0.0
		193-39-5	0.2	µg/L	<0.2	<0.2	0.0
		53-70-3	0.2	µg/L	<0.2	<0.2	0.0
		191-24-2	0.2	µg/L	<0.2	<0.2	0.0
		-----	2.2	µg/L	<2.2	<2.2	0.0
		-----	6.8	µg/L	<6.8	<6.8	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3828395)							
HK1504957-006	SD2 ELUTRIATE BLK	91-20-3	0.2	µg/L	<0.2	<0.2	0.0
		208-96-8	0.2	µg/L	<0.2	<0.2	0.0
		83-32-9	0.2	µg/L	<0.2	<0.2	0.0
		86-73-7	0.2	µg/L	<0.2	<0.2	0.0
		85-01-8	0.2	µg/L	<0.2	<0.2	0.0
		120-12-7	0.2	µg/L	<0.2	<0.2	0.0
		206-44-0	0.2	µg/L	<0.2	<0.2	0.0
		129-00-0	0.2	µg/L	<0.2	<0.2	0.0
		56-55-3	0.2	µg/L	<0.2	<0.2	0.0
		218-01-9	0.2	µg/L	<0.2	<0.2	0.0
		205-99-2	0.2	µg/L	<0.2	<0.2	0.0
		207-08-9	0.2	µg/L	<0.2	<0.2	0.0
		50-32-8	0.2	µg/L	<0.2	<0.2	0.0
		193-39-5	0.2	µg/L	<0.2	<0.2	0.0
		53-70-3	0.2	µg/L	<0.2	<0.2	0.0
		191-24-2	0.2	µg/L	<0.2	<0.2	0.0
		-----	2.2	µg/L	<2.2	<2.2	0.0
		-----	6.8	µg/L	<6.8	<6.8	0.0
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3828442)							
HK1504957-006	SD2 ELUTRIATE BLK	319-84-6	0.1	µg/L	<0.1	<0.1	0.0



Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EP-067 SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828442) - Continued								
HK1504957-006	SD2 ELUTRIATE BLK	beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	0.0
		gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	0.0
		delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	0.0
		Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	0.0
EP-390: Triorganotins (QC Lot: 3829008)								
HK1504957-001	SD2 0M-0.9M	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

Method: Compound	CAS Number	LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report				RPD (%)
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	Value	
Method Blank (MB) Report									
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)									
EK057A: Nitrite as N		0.01	mg/L	<0.01	0.05 mg/L	98.8	88	114	
					0.4 mg/L	104	98	112	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)									
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	106	92	108	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)									
EK067P: Total Phosphorus as P		0.01	mg/L	<0.01	0.5 mg/L	95.0	91	103	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)									
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	94	104	
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)									
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	112	76	116	
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	106	81	109	
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	88.5	80	112	
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	111	79	115	
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	91.8	82	108	
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	10 µg/L	100	82	118	
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	106	79	115	
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	89.7	78	106	
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	91.5	77	119	
EP-065A: PCB Single Congeners (QC Lot: 3828441)									
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	57.1	50	130	
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	56.0	50	130	
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	63.7	50	130	
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	67.8	50	130	



Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report											
Matrix	WATER	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)
Method: Compound													
EP-065A: PCB Single Congeners (QC Lot: 3828441) - Continued													
PCB 52		35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	64.2	---	50	130	---	---	---
PCB 66		32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	86.6	---	50	130	---	---	---
PCB 77		32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	87.5	---	50	130	---	---	---
PCB 101		37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	75.0	---	50	130	---	---	---
PCB 105		32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	88.0	---	50	130	---	---	---
PCB 118		31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	85.5	---	50	130	---	---	---
PCB 126		57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	90.9	---	50	130	---	---	---
PCB 128		38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	90.7	---	50	130	---	---	---
PCB 138		35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	85.1	---	50	130	---	---	---
PCB 153		35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	88.1	---	50	130	---	---	---
PCB 169		32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	89.4	---	50	130	---	---	---
PCB 170		35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	91.4	---	50	130	---	---	---
PCB 180		35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	93.7	---	50	130	---	---	---
PCB 187		52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	89.1	---	50	130	---	---	---
Total Polychlorinated biphenyls													
LOR: 0.18													
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824764)													
Naphthalene		91-20-3	0.2	µg/L	<0.2	0.5 µg/L	60.0	---	50	98	---	---	---
Acenaphthylene		208-96-8	0.2	µg/L	<0.2	0.5 µg/L	54.3	---	47	97	---	---	---
Acenaphthene		83-32-9	0.2	µg/L	<0.2	0.5 µg/L	55.3	---	49	93	---	---	---
Fluorene		86-73-7	0.2	µg/L	<0.2	0.5 µg/L	58.8	---	52	92	---	---	---
Phenanthrene		85-01-8	0.2	µg/L	<0.2	0.5 µg/L	51.7	---	51	91	---	---	---
Anthracene		120-12-7	0.2	µg/L	<0.2	0.5 µg/L	55.6	---	48	95	---	---	---
Fluoranthene		206-44-0	0.2	µg/L	<0.2	0.5 µg/L	77.2	---	68	109	---	---	---
Pyrene		129-00-0	0.2	µg/L	<0.2	0.5 µg/L	80.9	---	69	111	---	---	---
Benz(a)anthracene		56-55-3	0.2	µg/L	<0.2	0.5 µg/L	94.4	---	64	119	---	---	---
Chrysene		218-01-9	0.2	µg/L	<0.2	0.5 µg/L	107	---	50	124	---	---	---
Benzo(b)fluoranthene		205-99-2	0.2	µg/L	<0.2	0.5 µg/L	82.7	---	54	124	---	---	---
Benzo(k)fluoranthene		207-08-9	0.2	µg/L	<0.2	0.5 µg/L	98.2	---	54	130	---	---	---
Benzo(a)pyrene		50-32-8	0.2	µg/L	<0.2	0.5 µg/L	72.5	---	60	120	---	---	---
Indeno(1,2,3-cd)pyrene		193-39-5	0.2	µg/L	<0.2	0.5 µg/L	70.4	---	60	119	---	---	---
Dibenz(a,h)anthracene		53-70-3	0.2	µg/L	<0.2	0.5 µg/L	55.7	---	48	120	---	---	---
Benzo(g,h,i)perylene		191-24-2	0.2	µg/L	<0.2	0.5 µg/L	54.9	---	52	125	---	---	---
Low M.W. PAHs													
LOR: 1.2													
High M.W. PAHs													
LOR: 2.0													
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3828395)													
Naphthalene		91-20-3	0.2	µg/L	<0.2	0.5 µg/L	60.9	---	50	98	---	---	---
Acenaphthylene		208-96-8	0.2	µg/L	<0.2	0.5 µg/L	55.3	---	47	97	---	---	---
Acenaphthene		83-32-9	0.2	µg/L	<0.2	0.5 µg/L	55.8	---	49	93	---	---	---
Fluorene		86-73-7	0.2	µg/L	<0.2	0.5 µg/L	59.8	---	52	92	---	---	---
Phenanthrene		85-01-8	0.2	µg/L	<0.2	0.5 µg/L	52.4	---	51	91	---	---	---
Anthracene		120-12-7	0.2	µg/L	<0.2	0.5 µg/L	55.9	---	48	95	---	---	---
Fluoranthene		206-44-0	0.2	µg/L	<0.2	0.5 µg/L	76.6	---	68	109	---	---	---
Pyrene		129-00-0	0.2	µg/L	<0.2	0.5 µg/L	81.0	---	69	111	---	---	---



Matrix: WATER		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3828395) - Continued														
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	96.3	---	---	64	119	---	---	---	---
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	102	---	---	50	124	---	---	---	---
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	82.6	---	---	54	124	---	---	---	---
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	99.2	---	---	54	130	---	---	---	---
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	74.7	---	---	60	120	---	---	---	---
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	72.0	---	---	60	119	---	---	---	---
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	56.3	---	---	48	120	---	---	---	---
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	54.6	---	---	52	125	---	---	---	---
Low M.W. PAHs	---	1.2	µg/L	<1.2	---	---	---	---	---	---	---	---	---	---
High M.W. PAHs	---	2.0	µg/L	<2.0	---	---	---	---	---	---	---	---	---	---
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828442)														
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	73.4	---	---	34	123	---	---	---	---
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	81.4	---	---	55	128	---	---	---	---
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	70.2	---	---	45	118	---	---	---	---
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	90.4	---	---	59	114	---	---	---	---
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	59.4	---	---	42	104	---	---	---	---
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	83.0	---	---	45	117	---	---	---	---
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	74.4	---	---	57	116	---	---	---	---
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	82.6	---	---	55	120	---	---	---	---
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	92.0	---	---	63	122	---	---	---	---
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	105	---	---	54	134	---	---	---	---
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	89.8	---	---	67	123	---	---	---	---
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	56.0	---	---	43	121	---	---	---	---
EP-390: Triorganotins (QC Lot: 3829008)														
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	96.8	---	---	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	MS	MSD	Recovery Limits (%)	RPD (%)		
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)										
HK1505116-005	Anonymous	EK057A: Nitrite as N		0.5 mg/L	94.0	-----	75	125	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)										
HK1504952-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	88.0	-----	75	125	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)										
HK1504949-001	Anonymous	EK067P: Total Phosphorus as P		0.5 mg/L	97.5	-----	75	125	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)										
HK1504948-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	118	-----	75	125	-----	-----
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)										
HK1504957-001	SD2 0M-0.9M	EG020: Arsenic	7440-38-2	10 µg/L	92.7	-----	75	125	-----	-----
		EG020: Cadmium	7440-43-9	10 µg/L	110	-----	75	125	-----	-----
		EG020: Chromium	7440-47-3	10 µg/L	105	-----	75	125	-----	-----
		EG020: Copper	7440-50-8	10 µg/L	99.8	-----	75	125	-----	-----
		EG020: Lead	7439-92-1	10 µg/L	102	-----	75	125	-----	-----
		EG020: Mercury	7439-97-6	0.2 µg/L	112	-----	75	125	-----	-----
		EG020: Nickel	7440-02-0	10 µg/L	94.6	-----	75	125	-----	-----
		EG020: Silver	7440-22-4	10 µg/L	79.3	-----	75	125	-----	-----
		EG020: Zinc	7440-66-6	10 µg/L	103	-----	75	125	-----	-----
EP-390: Triorganotins (QC Lot: 3829008)										
HK1504957-001	SD2 0M-0.9M	Tributyltin	56573-85-4	2 ngSn/L	100	-----	70	130	-----	-----

Surrogate Control Limits

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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

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EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026573-H026574
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Page : 1 of 10
Work Order : HK1504958

Date Samples Received : 04-FEB-2015
Issue Date : 25-FEB-2015
No. of samples received : 4
No. of samples analysed : 4

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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

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Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1504958

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: 23-FEB-2015

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: **HK1504958**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

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.

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



Page Number : 3 of 10
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504958

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID			
			Client sampling date / time	GB3	GB8	GB3	GB8
EP-390: Triorganotins	56573-86-4	0.015	[04-FEB-2015] HK1504958-001	[04-FEB-2015] HK1504958-002	[04-FEB-2015] HK1504958-003	[04-FEB-2015] HK1504958-004
Tributyltin			<0.015	<0.015	<0.015	<0.015



Sub-Matrix: ELUTRIATE	Client sample ID		CAS Number	LOR	Unit	GB3		GB8		GB3		GB8	
	Client sampling date / time	Client sampling date / time				ELUTRIATE BLK	ELUTRIATE BLK	ELUTRIATE BLK	ELUTRIATE BLK	ELUTRIATE BLK	ELUTRIATE BLK		
EDJEK: Inorganic Nonmetallic Parameters													
EK055K: Ammonia as N	7664417	0.01	mg/L	0.82	<10	<10	<10	0.06	0.09	<10	<10	<0.01	0.09
EK057A: Nitrite as N	----	0.01	mg/L	<0.01	<0.2	<0.2	<0.2	<0.01	<0.01	<0.2	<0.2	<0.01	<0.01
EK058A: Nitrate as N	14797558	0.01	mg/L	0.04	<1	<1	<1	0.10	0.25	<1	<1	0.10	0.25
EK061P: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.3	<1	<1	<1	0.3	0.4	<1	<1	0.3	0.4
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.06	<1	<1	<1	0.01	0.03	<1	<1	0.01	0.03
EK071K: Reactive Phosphorus as P	14265442	10	µg/L	20	<10	<10	<10	<10	10	<10	<10	<10	10
EG: Metals and Major Cations - Filtered													
EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EG020: Chromium	7440-47-3	1	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG020: Copper	7440-50-8	1	µg/L	1	1	1	1	2	3	1	2	1	3
EG020: Lead	7439-92-1	1	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EG020: Nickel	7440-02-0	1	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG020: Silver	7440-22-4	1	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG020: Zinc	7440-66-6	10	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EP-065A: PCB Single Congeners													
PCB 8	34883-43-7	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<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	<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	<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	<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	<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	<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	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 101	37680-73-2	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<0.01	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)													
Naphthalene	9120-3	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<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	<0.2	<0.2	<0.2	<0.2	<0.2



Sub-Matrix: ELUTRIATE		Client sample ID		GB3	GB8	GB3	GB8	GB3	GB8
Compound	CAS Number	LOR	Unit	[04-FEB-2015] HK1504958-001	[04-FEB-2015] HK1504958-002	[04-FEB-2015] HK1504958-003	[04-FEB-2015] HK1504958-004	[04-FEB-2015] HK1504958-003	[04-FEB-2015] HK1504958-004
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued									
Acenaphthene	83-32-9	0.2	µg/L	<0.2	<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	<0.2
Phenanthrene	85-018	0.2	µg/L	<0.2	<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	<0.2
Fluoranthene	206-44-0	0.2	µg/L	<0.2	<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	<0.2
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	<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	<0.2
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	<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	<0.2
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	<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	<0.2
Low M.W. PAHs	----	2.2	µg/L	<2.2	<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	<6.8
EP-067_SR-A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	103107-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%	51.4	56.7	55.4	61.3	55.4	61.3
4-Terphenyl-d14	1718-51-0	0.1	%	98.9	103	92.6	106	92.6	106
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate									
Decachlorobiphenyl	205124-3	0.1	%	72.0	70.7	70.5	73.5	70.5	73.5
EP-067_SR-S: Pesticide Surrogate									
Tetrachlorometaxylene	877-09-8	0.1	%	51.2	54.0	57.0	57.7	57.0	57.7
Dibutylchlorendate	1770-80-5	0.1	%	74.2	94.5	88.6	92.4	88.6	92.4



Laboratory Duplicate (DUP) Report

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
							Original Result	Duplicate Result	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)									
HK1505116-005	Anonymous		EK057A: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)									
HK1504952-001	Anonymous		EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.96	0.91	5.3
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)									
HK1504949-001	Anonymous		EK067P: Total Phosphorus as P	----	0.01	mg/L	0.06	0.05	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)									
HK1504948-001	Anonymous		EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.17	0.17	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)									
Anonymous									
EG020: Cadmium									
				7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
EG020: Mercury									
				7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
EG020: Chromium									
				7440-47-3	1	µg/L	<1	<1	0.0
EG020: Copper									
				7440-50-8	1	µg/L	2	1	0.0
EG020: Lead									
				7439-92-1	1	µg/L	<1	<1	0.0
EG020: Nickel									
				7440-02-0	1	µg/L	2	2	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
EG020: Cadmium									
				7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
EG020: Mercury									
				7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
EG020: Chromium									
				7440-47-3	1	µg/L	<1	<1	0.0
EG020: Copper									
				7440-50-8	1	µg/L	2	2	0.0
EG020: Lead									
				7439-92-1	1	µg/L	<1	<1	0.0
EG020: Nickel									
				7440-02-0	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	20	20	0.0
EG020: Zinc									
				7440-66-6	10	µg/L	<10	<10	0.0
EP-065A: PCB Single Congeners (QC Lot: 3828441)									
Anonymous									
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 44									
				41464-39-5	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 66									
				32598-10-0	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 101									
				37680-73-2	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 118									
				31508-00-6	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 128									
				38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
PCB 138									
				35065-28-2	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 169									
				32774-16-6	0.01	µg/L	<0.01	<0.01	0.0



Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report											
Method/Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)													
EK057A: Nitrite as N	---	0.01	mg/L	<0.01	0.05 mg/L	98.8	---	---	88	88	114	---	---
				---	0.4 mg/L	104	---	---	98	98	112	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)													
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	106	---	---	92	92	108	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)													
EK067P: Total Phosphorus as P	---	0.01	mg/L	<0.01	0.5 mg/L	95.0	---	---	91	91	103	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)													
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	---	---	94	94	104	---	---
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)													
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	112	---	---	76	76	116	---	---
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	106	---	---	81	81	109	---	---
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	88.5	---	---	80	80	112	---	---
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	111	---	---	79	79	115	---	---
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	91.8	---	---	82	82	108	---	---
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	100	---	---	82	82	118	---	---
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	106	---	---	79	79	115	---	---
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	89.7	---	---	78	78	106	---	---
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	91.5	---	---	77	77	119	---	---
EP-065A: PCB Single Congeners (QC Lot: 3828441)													
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	57.1	---	---	50	50	130	---	---
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	56.0	---	---	50	50	130	---	---
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	63.7	---	---	50	50	130	---	---
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	67.8	---	---	50	50	130	---	---
PCB 52	35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	64.2	---	---	50	50	130	---	---
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	86.6	---	---	50	50	130	---	---
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	87.5	---	---	50	50	130	---	---
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	75.0	---	---	50	50	130	---	---
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	88.0	---	---	50	50	130	---	---
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	85.5	---	---	50	50	130	---	---
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	90.9	---	---	50	50	130	---	---
PCB 128	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	90.7	---	---	50	50	130	---	---
PCB 138	35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	85.1	---	---	50	50	130	---	---
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	88.1	---	---	50	50	130	---	---
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	89.4	---	---	50	50	130	---	---
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	91.4	---	---	50	50	130	---	---
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	93.7	---	---	50	50	130	---	---
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	89.1	---	---	50	50	130	---	---
Total Polychlorinated biphenyls	---	0.18	µg/L	<0.18	---	---	---	---	---	---	---	---	---
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3828395)													
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	60.9	---	---	50	50	98	---	---
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	55.3	---	---	47	47	97	---	---
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	55.8	---	---	49	49	93	---	---



Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report									
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3828395) - Continued											
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	59.8	---	52	92	---	---
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	52.4	---	51	91	---	---
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	55.9	---	48	95	---	---
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	76.6	---	68	109	---	---
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	81.0	---	69	111	---	---
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	96.3	---	64	119	---	---
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	102	---	50	124	---	---
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	82.6	---	54	124	---	---
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	99.2	---	54	130	---	---
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	74.7	---	60	120	---	---
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	72.0	---	60	119	---	---
Dibenzo(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	56.3	---	48	120	---	---
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	54.6	---	52	125	---	---
Low M.W. PAHs	---	1.2	µg/L	<1.2	---	---	---	---	---	---	---
High M.W. PAHs	---	2.0	µg/L	<2.0	---	---	---	---	---	---	---
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828442)											
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	73.4	---	34	123	---	---
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	81.4	---	55	128	---	---
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	70.2	---	45	118	---	---
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	90.4	---	59	114	---	---
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	59.4	---	42	104	---	---
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	83.0	---	45	117	---	---
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	74.4	---	57	116	---	---
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	82.6	---	55	120	---	---
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	92.0	---	63	122	---	---
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	105	---	54	134	---	---
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	89.8	---	67	123	---	---
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	56.0	---	43	121	---	---
EP-390: Triorganotin (QC Lot: 3829008)											
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	96.8	---	70	130	---	---



Page Number : 10 of 10
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1504958

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

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
				Spike Concentration	MS	MSD	Recovery Limits (%)	RPD (%)	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)									
HK1505116-005	Anonymous	EK057A: Nitrite as N	---	0.5 mg/L	94.0	---	75	125	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)									
HK1504952-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	88.0	---	75	125	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)									
HK1504949-001	Anonymous	EK067P: Total Phosphorus as P	---	0.5 mg/L	97.5	---	75	125	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)									
HK1504948-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	118	---	75	125	---
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)									
HK1504957-001	Anonymous	EG020: Arsenic	7440-38-2	10 µg/L	92.7	---	75	125	---
		EG020: Cadmium	7440-43-9	10 µg/L	110	---	75	125	---
		EG020: Chromium	7440-47-3	10 µg/L	105	---	75	125	---
		EG020: Copper	7440-50-8	10 µg/L	99.8	---	75	125	---
		EG020: Lead	7439-92-1	10 µg/L	102	---	75	125	---
		EG020: Mercury	7439-97-6	0.2 µg/L	112	---	75	125	---
		EG020: Nickel	7440-02-0	10 µg/L	94.6	---	75	125	---
		EG020: Silver	7440-22-4	10 µg/L	79.3	---	75	125	---
		EG020: Zinc	7440-66-6	10 µg/L	103	---	75	125	---
EP-390: Triorganotins (QC Lot: 3829008)									
HK1504957-001	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	100	---	70	130	---

Surrogate Control Limits

Compound	Sub-Matrix: ELUTRIATE	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
EP-067_SR-S: Pesticide Surrogate				
Tetrachlorometaxylene		877-09-8	50	130
Dibutylchloroendate		1770-80-5	50	130

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

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EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026575
Site : ----

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Page : 1 of 9

Work Order : HK1505107

Date Samples Received : 05-FEB-2015

Issue Date : 25-FEB-2015

No. of samples received : 4

No. of samples analysed : 4

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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

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Page Number : 2 of 9
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1505107

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: 18-FEB-2015

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: **HK1505107**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient 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 D3974-09 based on ASTM D3974-09, prior to 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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Unit	Client sample ID					
				SD1 0M-0.9M [05-FEB-2015] HK1505107-001	SD1 0.9M-1.9M [05-FEB-2015] HK1505107-002	SD1 1.9M-2.9M [05-FEB-2015] HK1505107-003	SD1 2.9M-3.9M [05-FEB-2015] HK1505107-004		
EA/ED: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	47.3	41.3	38.0	27.9		
EG: Metals and Major Cations									
EG020: Arsenic	7440-38-2	1	mg/kg	11	8	8	16		
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2		
EG020: Chromium	7440-47-3	1	mg/kg	28	29	23	23		
EG020: Copper	7440-50-8	1	mg/kg	21	10	8	10		
EG020: Lead	7439-92-1	1	mg/kg	49	36	30	26		
EG020: Mercury	7439-97-6	0.05	mg/kg	0.08	<0.05	<0.05	<0.05		
EG020: Nickel	7440-02-0	1	mg/kg	16	18	14	16		
EG020: Silver	7440-22-4	0.1	mg/kg	0.2	0.1	0.1	0.1		
EG020: Zinc	7440-66-6	1	mg/kg	102	92	69	63		
EP-065: PCB Single Congeners									
PCB 8	34883-43-7	3	µg/kg	<3	<3	<3	<3		
PCB 18	37680-65-2	3	µg/kg	<3	<3	<3	<3		
PCB 28	7012-37-5	3	µg/kg	<3	<3	<3	<3		
PCB 44	41464-39-5	3	µg/kg	<3	<3	<3	<3		
PCB 52	35693-99-3	3	µg/kg	<3	<3	<3	<3		
PCB 66	32598-10-0	3	µg/kg	<3	<3	<3	<3		
PCB 77	32598-13-3	3	µg/kg	<3	<3	<3	<3		
PCB 101	37680-73-2	3	µg/kg	<3	<3	<3	<3		
PCB 105	32598-14-4	3	µg/kg	<3	<3	<3	<3		
PCB 118	31508-00-6	3	µg/kg	<3	<3	<3	<3		
PCB 126	57465-28-8	3	µg/kg	<3	<3	<3	<3		
PCB 128	38380-07-3	3	µg/kg	<3	<3	<3	<3		
PCB 138	35065-28-2	3	µg/kg	<3	<3	<3	<3		
PCB 153	35065-27-1	3	µg/kg	<3	<3	<3	<3		
PCB 169	32774-16-6	3	µg/kg	<3	<3	<3	<3		
PCB 170	35065-30-6	3	µg/kg	<3	<3	<3	<3		
PCB 180	35065-29-3	3	µg/kg	<3	<3	<3	<3		
PCB 187	52663-68-0	3	µg/kg	<3	<3	<3	<3		
Total Polychlorinated biphenyls	----	18	µg/kg	<18	<18	<18	<18		
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	50	µg/kg	<50	<50	<50	<50		
Acenaphthylene	208-96-8	50	µg/kg	<50	<50	<50	<50		
Acenaphthene	83-32-9	50	µg/kg	<50	<50	<50	<50		
Fluorene	86-73-7	50	µg/kg	<50	<50	<50	<50		
Phenanthrene	85-01-8	50	µg/kg	<50	<50	<50	<50		



Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time		Client sample ID			
			Unit	Unit	SD1 0M-0.9M [05-FEB-2015] HK1505107-001	SD1 0.9M-1.9M [05-FEB-2015] HK1505107-002	SD1 1.9M-2.9M [05-FEB-2015] HK1505107-003	SD1 2.9M-3.9M [05-FEB-2015] HK1505107-004
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
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
Benzo(a)anthracene	56-55-3	150	µg/kg	<150	<150	<150	<150	<150
Chrysene	218-019	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 Aromatic Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	32160-8	0.1	%	95.1	93.9	95.5	97.2	Surrogate control limits listed at end of this report.
4-Terphenyl-d14	1718-510	0.1	%	88.0	86.5	94.4	93.3	Surrogate control limits listed at end of this report.
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								
Decachlorobiphenyl	205124-3	0.1	%	66.4	70.6	69.4	71.0	Surrogate control limits listed at end of this report.



Sub-Matrix: INTERSTITIAL WATER

Compound	CAS Number	LOR	Client sample ID			
			Client sampling date / time	Unit	µg TBT / L	
EP-390; Triorganotins Tributyltin	56573-85-4	0.015	SD1 0M-0.9M [05-FEB-2015]	SD1 0.9M-1.9M [05-FEB-2015]	SD1 1.9M-2.9M [05-FEB-2015]	SD1 2.9M-3.9M [05-FEB-2015]
			HK1505107-001	HK1505107-002	HK1505107-003	HK1505107-004
			<0.015	<0.015	<0.015	<0.015



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3819003)								
HK1504955-002	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	51.4	51.6	0.4
HK1505113-003	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	42.3	41.6	1.6
EG: Metals and Major Cations (QC Lot: 3819190)								
HK1504953-002	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	0.1	0.1	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	12	10	10.4
		EG020: Chromium	7440-47-3	1	mg/kg	27	26	0.0
		EG020: Copper	7440-50-8	1	mg/kg	12	12	0.0
		EG020: Lead	7439-92-1	1	mg/kg	43	43	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	16	16	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	89	84	6.0
HK1505107-004	SD1 2.9M-3.9M	EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
		EG020: Silver	7440-22-4	0.1	mg/kg	0.1	0.1	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	16	16	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	23	23	0.0
		EG020: Copper	7440-50-8	1	mg/kg	10	10	0.0
		EG020: Lead	7439-92-1	1	mg/kg	26	27	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	16	16	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	63	62	0.0
EP-065: PCB Single Congeners (QC Lot: 3817755)								
HK1504955-002	Anonymous	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3817754)								



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	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-065: PCB Single Congeners (QC Lot: 3817755) - Continued														
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	88.5	-----	-----	26	26	124	-----	-----	-----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	87.2	-----	-----	26	26	124	-----	-----	-----
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	91.1	-----	-----	24	24	125	-----	-----	-----
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	79.4	-----	-----	51	51	122	-----	-----	-----
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	78.3	-----	-----	46	46	122	-----	-----	-----
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	79.2	-----	-----	52	52	122	-----	-----	-----
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	78.4	-----	-----	50	50	123	-----	-----	-----
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	82.3	-----	-----	53	53	121	-----	-----	-----
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	81.5	-----	-----	54	54	124	-----	-----	-----
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	78.9	-----	-----	51	51	123	-----	-----	-----
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	78.2	-----	-----	51	51	124	-----	-----	-----
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	83.2	-----	-----	55	55	126	-----	-----	-----
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	85.5	-----	-----	58	58	124	-----	-----	-----
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	84.0	-----	-----	56	56	126	-----	-----	-----
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	80.6	-----	-----	51	51	123	-----	-----	-----
Total Polychlorinated biphenyls	-----	18	µg/kg	<18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3817754)														
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	89.3	-----	-----	68	68	107	-----	-----	-----
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	86.0	-----	-----	70	70	113	-----	-----	-----
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	95.5	-----	-----	68	68	108	-----	-----	-----
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	103	-----	-----	71	71	111	-----	-----	-----
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	102	-----	-----	71	71	110	-----	-----	-----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	101	-----	-----	63	63	117	-----	-----	-----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	108	-----	-----	72	72	113	-----	-----	-----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	108	-----	-----	72	72	112	-----	-----	-----
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	96.8	-----	-----	70	70	119	-----	-----	-----
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	93.2	-----	-----	79	79	112	-----	-----	-----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	85.3	-----	-----	68	68	125	-----	-----	-----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	87.6	-----	-----	75	75	113	-----	-----	-----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	70.8	-----	-----	64	64	118	-----	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	66.5	-----	-----	61	61	127	-----	-----	-----
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	68.3	-----	-----	66	66	112	-----	-----	-----
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	73.4	-----	-----	73	73	114	-----	-----	-----
Low M.W. PAHs	-----	550	µg/kg	<550	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	1700	µg/kg	<1700	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Matrix: WATER														
Method Blank (MB) Report														
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-390: Triorganotins (QC Lot: 3821358)														
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	97.6	-----	-----	70	70	130	-----	-----	-----
EP-390: Triorganotins (QC Lot: 3821359)														
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	112	-----	-----	70	70	130	-----	-----	-----



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

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration		Spike Recovery (%)		Recovery Limits (%)		RPD (%)		
				MS	MSD	Low	High	Value	Control Limit			
EG: Metals and Major Cations (QC Lot: 3819190)												
HK1504953-001	Anonymous			5 mg/kg	89.5	75	125					
		EG020: Arsenic	7440-38-2	5 mg/kg	94.0	75	125					
		EG020: Cadmium	7440-43-9	50 mg/kg	95.0	75	125					
		EG020: Chromium	7440-47-3	50 mg/kg	97.7	75	125					
		EG020: Copper	7440-50-8	50 mg/kg	90.8	75	125					
		EG020: Lead	7439-92-1	0.1 mg/kg	84.2	75	125					
		EG020: Mercury	7439-97-6	50 mg/kg	94.2	75	125					
		EG020: Nickel	7440-02-0	5 mg/kg	84.8	75	125					
		EG020: Silver	7440-22-4	5 mg/kg	# Not Determined							
		EG020: Zinc	7440-66-6	5 mg/kg								

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration		Spike Recovery (%)		Recovery Limits (%)		RPD (%)	
				MS	MSD	Low	High	Value	Control Limit		
Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report											
EP-390: Triorganotins (QC Lot: 3821358)	Anonymous			2 ngSn/L	96.8	70	130				
HK1504665-004	Anonymous	Tributyltin	56573-85-4								
EP-390: Triorganotins (QC Lot: 3821359)	Anonymous			2 ngSn/L	121	70	130				
HK1504953-001	Anonymous	Tributyltin	56573-85-4								

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
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

CERTIFICATE OF ANALYSIS

Client	: PO SUM ON MEDICINE FACTORY LIMITED	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 2
Contact	: DR DONNY LIU	Contact	: Fung Lim Chee, Richard	Work Order	: HK1506027
Address	: 12F-13F., PO CHAI INDUSTRIAL BUILDING, 28 WONG CHUK HANG ROAD, ABERDEEN, HONG KONG	Address	: 11F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: qapso@posumon.com.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: +852 2553 1038	Telephone	: +852 2610 1044		
Facsimile	: +852 2552 9011	Facsimile	: +852 2610 2021		
Project	: ----	Quote number	: ----		
Order number	: ----			Date Samples Received	: 16-FEB-2015
C-O-C number	: ----			Issue Date	: 24-FEB-2015
Site	: ----			No. of samples received	: 2
				No. of samples analysed	: 2

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: 16-FEB-2015

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: **HK1506027**

Sample(s) were received in a chilled condition. Microbiological sample(s), in 125mL plastic bottle labelled sterile, with addition of sodium thiosulfate solution. Sample(s) were analysed and reported on an as received basis. Sample(s) arrived in the laboratory at 10:15. Microbiological testing period: 16/02/2015 (12:00) - 18/02/2015.
Method Reference - Heterotrophic Plate Count: APHA 22e 9215A & B.
NOT DETECTED denotes result(s) is (are) less than the Limit of Report (LOR).

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Hong Kong Accreditation Service (HKAS) has accredited 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

Yu Kai Man

Senior Microbiologist

Authorised results for
Microbiology



Analytical Results

Sub-Matrix: WATER

Compound	CAS Number	LOR	Client sample ID		Unit	CFU/mL
			Client sampling date / time	Client sample ID		
EM: Microbiological Testing EM001: Heterotrophic Plate Count	----	1	16-FEB-2015 08:45	POINT 1 13/F	S1	NOT DETECTED
			16-FEB-2015 08:45	HK1506027-001			16-FEB-2015 08:45	HK1506027-002	NOT DETECTED



CERTIFICATE OF ANALYSIS

Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Contact : MR SUN NG
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GEOTECHNICAL ENGINEERING OFFICE,
23/F., KWUN TONG VIEW,
410 KWUN TONG ROAD, KOWLOON, HONG KONG
E-mail : sunng@cedd.gov.hk
Telephone : ----
Facsimile : ----
Project : AGREEMENT NO CE63_2012 (DS)
EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026577
Site : ----

Laboratory : ALS Technichem HK Pty Ltd
Contact : Fung Lim Chee, Richard
Address : 11/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong
E-mail : Richard.Fung@alsglobal.com
Telephone : +852 2610 1044
Facsimile : +852 2610 2021
Quote number : HK/1393/2014

Page : 1 of 5
Work Order : HK1505110

Date Samples Received : 05-FEB-2015
Issue Date : 25-FEB-2015
No. of samples received : 4
No. of samples analysed : 4

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Signatories

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics



Page Number : 2 of 5
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1505110

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: 18-FEB-2015

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: **HK1505110**

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

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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



Analytical Results

Compound	CAS Number	LOR	Client sampling date / time		Client sample ID			
			Unit	%	SD1 0M-0.9M [05-FEB-2015] HK1505110-001	SD1 0.9M-1.9M [05-FEB-2015] HK1505110-002	SD1 1.9M-2.9M [05-FEB-2015] HK1505110-003	SD1 2.9M-3.9M [05-FEB-2015] HK1505110-004
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	46.4	41.1	37.3	27.2	
ED/EK: Inorganic Nonmetallic Parameters								
EK055: Ammonia as N	7664417	0.1	mg/kg	5.6	4.4	2.2	1.4	
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	1040	883	676	342	
EK067A: Total Phosphorus as P	----	1	mg/kg	472	431	544	286	
EP-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	103107-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP-067_SR-S: Pesticide Surrogate								
Tetrachloromethylene	877-09-8	0.1	%	85.6	88.0	85.2	89.6	Surrogate control limits listed at end of this report.
Dibutylchloroendate	1770-80-5	0.1	%	73.6	64.2	66.4	73.4	



Laboratory Duplicate (DUP) Report

Matrix: SOIL		Laboratory Duplicate (DUP) Report	
Laboratory sample ID	Client sample ID	Method: Compound	Method: Compound
CAS Number	LOR	Unit	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 3818995)			
HK1504956-002	Anonymous	EA055: Moisture Content (dried @ 103°C)	51.6
ED/EK: Inorganic Nonmetallic Parameters	0.1	%	0.4
HK1504954-001	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	1300
ED/EK: Inorganic Nonmetallic Parameters	1	mg/kg	7.6
HK1505110-001	SD1 0M-0.9M	EK067A: Total Phosphorus as P	464
ED/EK: Inorganic Nonmetallic Parameters	1	mg/kg	1.6
HK1504956-001	Anonymous	EK055: Ammonia as N	10.3
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3818196)	0.1	mg/kg	10.4
HK1505110-001	SD1 0M-0.9M	alpha-BHC	<0.50
		beta-BHC	<0.50
		gamma-BHC	<0.50
		delta-BHC	<0.50
		Heptachlor	<0.50
		Aldrin	<0.50
		Heptachlor epoxide	<0.50
		Endosulfan 1	<0.50
		4.4'-DDE	<0.50
		4.4'-DDD	<0.50
		Endosulfan sulfate	<0.50
		4.4'-DDT	<0.50

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	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	RPD (%)
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Low	High	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3819000)											
EK057A: Nitrite as N(Sol.)	-----	0.1	mg/kg	<0.1	2 mg/kg	105	85	-----	85	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824828)											
EK061A: Total Kjeldahl Nitrogen as N	-----	20	mg/kg	<20	1000 mg/kg	103	85	-----	85	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824829)											
EK067A: Total Phosphorus as P	-----	20	mg/kg	<20	695 mg/kg	92.8	85	-----	85	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825433)											
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	97.8	89	-----	89	113	-----
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3818196)											
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	77.6	55	-----	55	106	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	71.6	37	-----	37	123	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	71.4	43	-----	43	112	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	104	64	-----	64	113	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	74.0	42	-----	42	113	-----
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	103	57	-----	57	106	-----



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	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3818196) - Continued														
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	86.6	---	---	61	108	---	---	---	---
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	95.4	---	---	55	120	---	---	---	---
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	101	---	---	60	116	---	---	---	---
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	107	---	---	52	127	---	---	---	---
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	92.6	---	---	56	120	---	---	---	---
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	59.8	---	---	45	126	---	---	---	---

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

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

Surrogate Control Limits

Sub-Matrix: SEDIMENT		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

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410 KWUN TONG ROAD, KOWLOON, HONG KONG
E-mail : sunng@cedd.gov.hk
Telephone : ----
Facsimile : ----
Project : AGREEMENT NO CE63_2012 (DS)
EXPANSION OF SHA TAU KOK SEWAGE
TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026578-H0266579
Site : ----

Laboratory : ALS Technichem HK Pty Ltd
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Facsimile : +852 2610 2021
Quote number : HK/1393/2014

Page : 1 of 10
Work Order : HK1505112

Date Samples Received : 05-FEB-2015
Issue Date : 25-FEB-2015
No. of samples received : 5
No. of samples analysed : 5

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Signatories

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics

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A Campbell Brothers Limited Company



Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1505112

General Comments

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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: HK1505112

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.
Sample(s) were received in an ambient condition.

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

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

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



Page Number : 3 of 10
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505112

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Unit	Client sample ID				
				SD1 0M-0.9M [05-FEB-2015] HK1505112-001	SD1 0.9M-1.9M [05-FEB-2015] HK1505112-002	SD1 1.9M-2.9M [05-FEB-2015] HK1505112-003	SD1 2.9M-3.9M [05-FEB-2015] HK1505112-004	SD1 ELUTRIATE BLK [05-FEB-2015] HK1505112-005
EP-390: Triorganofins Tributyltin	56573-85-4	0.015	µg TBT/L	<0.015	<0.015	<0.015	<0.015	<0.015



Page Number : 4 of 10
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order HK1505112

Sub-Matrix: ELUTRIATE		Client sample ID		Client sampling date / time		Client sample ID		Client sampling date / time		Client sample ID		Client sampling date / time	
Compound	CAS Number	LOR	Unit	SD1 0M-0.9M	SD1 0.9M-1.9M	SD1 1.9M-2.9M	SD1 2.9M-3.9M	SD1 0M-0.9M	SD1 0.9M-1.9M	SD1 1.9M-2.9M	SD1 2.9M-3.9M	SD1 0M-0.9M	SD1 0.9M-1.9M
				[05-FEB-2015] HK1505112-001	[05-FEB-2015] HK1505112-002	[05-FEB-2015] HK1505112-003	[05-FEB-2015] HK1505112-004	[05-FEB-2015] HK1505112-001	[05-FEB-2015] HK1505112-002	[05-FEB-2015] HK1505112-003	[05-FEB-2015] HK1505112-004	[05-FEB-2015] HK1505112-001	[05-FEB-2015] HK1505112-002
ED/EK: Inorganic Nonmetallic Parameters													
EK055K: Ammonia as N	7664-417	0.01	mg/L	0.40	0.40	0.32	0.18	0.40	0.40	0.32	0.18	0.40	0.40
EK057A: Nitrite as N	----	0.01	mg/L	0.03	<0.01	0.02	0.04	0.03	<0.01	0.02	0.04	0.03	<0.01
EK058A: Nitrate as N	14797-55-8	0.01	mg/L	0.12	0.15	0.15	0.20	0.12	0.15	0.15	0.20	0.12	0.15
EK061P: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.9	0.8	0.8	0.6	0.9	0.8	0.8	0.6	0.9	0.8
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.15	0.16	0.10	0.06	0.15	0.16	0.10	0.06	0.15	0.16
EK071K: Reactive Phosphorus as P	14285-44-2	10	µg/L	110	140	70	20	110	140	70	20	110	<10
EG: Metals and Major Cations - Filtered													
EG020: Arsenic	7440-38-2	10	µg/L	20	20	10	<10	20	20	10	<10	20	<10
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2
EG020: Chromium	7440-47-3	1	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG020: Copper	7440-50-8	1	µg/L	2	2	2	2	2	2	2	2	2	3
EG020: Lead	7439-92-1	1	µg/L	<1	1	1	<1	<1	1	1	<1	<1	<1
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
EG020: Nickel	7440-02-0	1	µg/L	1	<1	<1	<1	1	<1	<1	<1	<1	<1
EG020: Silver	7440-22-4	1	µg/L	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG020: Zinc	7440-66-6	10	µg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
EP-065A: PCB Single Congeners													
PCB 8	34883-43-7	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<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	<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	<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	<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	<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	<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	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 101	37680-73-2	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<0.01	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)													
Naphthalene	9120-3	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<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	<0.2	<0.2	<0.2	<0.2	<0.2



Sub-Matrix: ELUTRIATE	Client sample ID	Client sampling date / time		SD1 0M-0.9M [05-FEB-2015] HK1505112-001	SD1 0.9M-1.9M [05-FEB-2015] HK1505112-002	SD1 1.9M-2.9M [05-FEB-2015] HK1505112-003	SD1 2.9M-3.9M [05-FEB-2015] HK1505112-004	SD1 ELUTRIATE BLK [05-FEB-2015] HK1505112-005
		CAS Number	Unit					
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
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	85-018	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
Benzo(a)anthracene	56-55-3	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Chrysene	218-019	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
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-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	53.8	50.8	54.0	55.6	52.8
4-Terphenyl-d14	1718-510	0.1	%	96.0	86.4	116	124	120
EP-066S: PCB Congeners and Organochlorine Pesticides Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	60.5	63.6	79.8	58.1	85.2
EP-067_SR-S: Pesticide Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	52.6	56.6	55.8	50.4	55.4
Dibutylchloride	1770-80-5	0.1	%	83.2	74.2	80.4	72.8	89.2



Laboratory Duplicate (DUP) Report

Matrix: WATER		Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)								
HK1505116-005	Anonymous	EK057A: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)								
HK1504952-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.96	0.91	5.3
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)								
HK1504949-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	0.06	0.05	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)								
HK1504948-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.17	0.17	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)								
Anonymous								
		EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
		EG020: Chromium	7440-47-3	1	µg/L	<1	<1	0.0
		EG020: Copper	7440-50-8	1	µg/L	2	1	0.0
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
		EG020: Nickel	7440-02-0	1	µg/L	2	2	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
		EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
		EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
		EG020: Chromium	7440-47-3	1	µg/L	<1	<1	0.0
		EG020: Copper	7440-50-8	1	µg/L	2	2	0.0
		EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
		EG020: Nickel	7440-02-0	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	20	20	0.0
		EG020: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
EP-065A: PCB Single Congeners (QC Lot: 3828441)								
Anonymous								
HK1504957-006	Anonymous	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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
		PCB 138	35065-28-2	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 169	32774-16-6	0.01	µg/L	<0.01	<0.01	0.0



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505112

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EP-065A: PCB Single Congeners (QC Lot: 3828441) - Continued								
HK1504957-006	Anonymous	PCB 170	35065-30-6	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 187	52663-68-0	0.01	µg/L	<0.01	<0.01	0.0
		Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3828395)								
HK1504957-006	Anonymous	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
		Benzo(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
		Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	0.0
		Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	0.0
		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
		Dibenzo(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
		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-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828442)								
HK1504957-006	Anonymous	alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	0.0
		beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	0.0
		gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	0.0
		delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	0.0
		Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	0.0
EP-390: Triorganotin (QC Lot: 3829008)								
HK1504957-001	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

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



Method: Compound		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)												
EK057A: Nitrite as N	---	0.01	mg/L	<0.01	0.05 mg/L	98.8	---	88	88	114	---	---
				---	0.4 mg/L	104	---	98	98	112	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)												
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	106	---	92	92	108	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)												
EK067P: Total Phosphorus as P	---	0.01	mg/L	<0.01	0.5 mg/L	95.0	---	91	91	103	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)												
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	---	94	94	104	---	---
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)												
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	112	---	76	76	116	---	---
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	106	---	81	81	109	---	---
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	88.5	---	80	80	112	---	---
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	111	---	79	79	115	---	---
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	91.8	---	82	82	108	---	---
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	100	---	82	82	118	---	---
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	106	---	79	79	115	---	---
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	89.7	---	78	78	106	---	---
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	91.5	---	77	77	119	---	---
EP-065A: PCB Single Congeners (QC Lot: 3828441)												
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	57.1	---	50	50	130	---	---
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	56.0	---	50	50	130	---	---
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	63.7	---	50	50	130	---	---
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	67.8	---	50	50	130	---	---
PCB 52	35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	64.2	---	50	50	130	---	---
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	86.6	---	50	50	130	---	---
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	87.5	---	50	50	130	---	---
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	75.0	---	50	50	130	---	---
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	88.0	---	50	50	130	---	---
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	85.5	---	50	50	130	---	---
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	90.9	---	50	50	130	---	---
PCB 128	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	90.7	---	50	50	130	---	---
PCB 138	35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	85.1	---	50	50	130	---	---
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	88.1	---	50	50	130	---	---
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	89.4	---	50	50	130	---	---
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	91.4	---	50	50	130	---	---
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	93.7	---	50	50	130	---	---
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	89.1	---	50	50	130	---	---
Total Polychlorinated biphenyls	---	0.18	µg/L	<0.18	---	---	---	---	---	---	---	---
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3828395)												
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	60.9	---	50	50	98	---	---
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	55.3	---	47	47	97	---	---
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	55.8	---	49	49	93	---	---



Matrix: WATER		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3828395) - Continued													
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	59.8	-----	-----	52	92	-----	-----	-----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	52.4	-----	-----	51	91	-----	-----	-----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	55.9	-----	-----	48	95	-----	-----	-----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	76.6	-----	-----	68	109	-----	-----	-----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	81.0	-----	-----	69	111	-----	-----	-----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	96.3	-----	-----	64	119	-----	-----	-----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	102	-----	-----	50	124	-----	-----	-----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	82.6	-----	-----	54	124	-----	-----	-----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	99.2	-----	-----	54	130	-----	-----	-----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	74.7	-----	-----	60	120	-----	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	72.0	-----	-----	60	119	-----	-----	-----
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	56.3	-----	-----	48	120	-----	-----	-----
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	54.6	-----	-----	52	125	-----	-----	-----
Low M.W. PAHs	----	1.2	µg/L	<1.2	-----	-----	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	----	2.0	µg/L	<2.0	-----	-----	-----	-----	-----	-----	-----	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828442)													
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	73.4	-----	-----	34	123	-----	-----	-----
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	81.4	-----	-----	55	128	-----	-----	-----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	70.2	-----	-----	45	118	-----	-----	-----
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	90.4	-----	-----	59	114	-----	-----	-----
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	59.4	-----	-----	42	104	-----	-----	-----
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	83.0	-----	-----	45	117	-----	-----	-----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	74.4	-----	-----	57	116	-----	-----	-----
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	82.6	-----	-----	55	120	-----	-----	-----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	92.0	-----	-----	63	122	-----	-----	-----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	105	-----	-----	54	134	-----	-----	-----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	89.8	-----	-----	67	123	-----	-----	-----
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	56.0	-----	-----	43	121	-----	-----	-----
EP-390: Triorganotins (QC Lot: 3829008)													
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	96.8	-----	-----	70	130	-----	-----	-----



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505112

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	MS	MSD	Recovery Limits (%)	RPD (%)	
				MS	MSD	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)									
HK1505116-005	Anonymous	EK057A: Nitrite as N	----	0.5 mg/L	94.0	75	125	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)									
HK1504952-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	88.0	75	125	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)									
HK1504949-001	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	97.5	75	125	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)									
HK1504948-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	118	75	125	-----	-----
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)									
HK1504957-001	Anonymous	EG020: Arsenic	7440-38-2	10 µg/L	92.7	75	125	-----	-----
		EG020: Cadmium	7440-43-9	10 µg/L	110	75	125	-----	-----
		EG020: Chromium	7440-47-3	10 µg/L	105	75	125	-----	-----
		EG020: Copper	7440-50-8	10 µg/L	99.8	75	125	-----	-----
		EG020: Lead	7439-92-1	10 µg/L	102	75	125	-----	-----
		EG020: Mercury	7439-97-6	0.2 µg/L	112	75	125	-----	-----
		EG020: Nickel	7440-02-0	10 µg/L	94.6	75	125	-----	-----
		EG020: Silver	7440-22-4	10 µg/L	79.3	75	125	-----	-----
		EG020: Zinc	7440-66-6	10 µg/L	103	75	125	-----	-----
EP-390: Triorganotins (QC Lot: 3829008)									
HK1504957-001	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	100	70	130	-----	-----

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: ELUTRIATE			
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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchloroendate	1770-80-5	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 9
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1505113
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E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com	Date Samples Received	: 06-FEB-2015
Telephone	: ----	Telephone	: +852 2610 1044	Issue Date	: 25-FEB-2015
Facsimile	: ----	Facsimile	: +852 2610 2021	No. of samples received	: 4
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	No. of samples analysed	: 4
Order number	: GE/2014/21.01				
C-O-C number	: H026559				
Site	: ----				

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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.

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Authorised results for

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Page Number : 2 of 9
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1505113

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: 18-FEB-2015

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: **HK1505113**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.
Sample(s) were received in an ambient 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 D3974-09 based on ASTM D3974-09, prior to 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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Unit	Client sample ID					
				SD4 0M-0.9M [06-FEB-2015] HK1505113-001	SD4 0.9M-1.9M [06-FEB-2015] HK1505113-002	SD4 1.9M-2.9M [06-FEB-2015] HK1505113-003	SD4 2.9M-3.9M [06-FEB-2015] HK1505113-004		
EA055: Physical and Aggregate Properties									
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	43.6	45.1	42.3	40.4		
EG: Metals and Major Cations									
EG020: Arsenic	7440-38-2	1	mg/kg	10	10	11	9		
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2		
EG020: Chromium	7440-47-3	1	mg/kg	26	31	35	28		
EG020: Copper	7440-50-8	1	mg/kg	10	11	10	12		
EG020: Lead	7439-92-1	1	mg/kg	39	39	36	44		
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05		
EG020: Nickel	7440-02-0	1	mg/kg	15	16	20	17		
EG020: Silver	7440-22-4	0.1	mg/kg	0.1	0.1	0.1	0.1		
EG020: Zinc	7440-66-6	1	mg/kg	77	88	98	85		
EP-065: PCB Single Congeners									
PCB 8	34883-43-7	3	µg/kg	<3	<3	<3	<3		
PCB 18	37680-65-2	3	µg/kg	<3	<3	<3	<3		
PCB 28	7012-37-5	3	µg/kg	<3	<3	<3	<3		
PCB 44	41464-39-5	3	µg/kg	<3	<3	<3	<3		
PCB 52	35693-99-3	3	µg/kg	<3	<3	<3	<3		
PCB 66	32598-10-0	3	µg/kg	<3	<3	<3	<3		
PCB 77	32598-13-3	3	µg/kg	<3	<3	<3	<3		
PCB 101	37680-73-2	3	µg/kg	<3	<3	<3	<3		
PCB 105	32598-14-4	3	µg/kg	<3	<3	<3	<3		
PCB 118	31508-00-6	3	µg/kg	<3	<3	<3	<3		
PCB 126	57465-28-8	3	µg/kg	<3	<3	<3	<3		
PCB 128	38380-07-3	3	µg/kg	<3	<3	<3	<3		
PCB 138	35065-28-2	3	µg/kg	<3	<3	<3	<3		
PCB 153	35065-27-1	3	µg/kg	<3	<3	<3	<3		
PCB 169	32774-16-6	3	µg/kg	<3	<3	<3	<3		
PCB 170	35065-30-6	3	µg/kg	<3	<3	<3	<3		
PCB 180	35065-29-3	3	µg/kg	<3	<3	<3	<3		
PCB 187	52663-68-0	3	µg/kg	<3	<3	<3	<3		
Total Polychlorinated biphenyls	----	18	µg/kg	<18	<18	<18	<18		
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	91-20-3	50	µg/kg	<50	<50	<50	<50		
Acenaphthylene	208-96-8	50	µg/kg	<50	<50	<50	<50		
Acenaphthene	83-32-9	50	µg/kg	<50	<50	<50	<50		
Fluorene	86-73-7	50	µg/kg	<50	<50	<50	<50		
Phenanthrene	85-018	50	µg/kg	<50	<50	<50	<50		



Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		SD4 0M-0.9M [06-FEB-2015] HK1505113-001	SD4 0.9M-1.9M [06-FEB-2015] HK1505113-002	SD4 1.9M-2.9M [06-FEB-2015] HK1505113-003	SD4 2.9M-3.9M [06-FEB-2015] HK1505113-004
			Client sampling date / time	Unit				
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
Anthracene	120-12-7	50		µg/kg	<50	<50	<50	<50
Fluoranthene	206-44-0	150		µg/kg	<150	<150	<150	<150
Pyrene	129-00-0	150		µg/kg	<150	<150	<150	<150
Benzo(a)anthracene	56-55-3	150		µg/kg	<150	<150	<150	<150
Chrysene	218-01-9	150		µg/kg	<150	<150	<150	<150
Benzo(b)fluoranthene	205-99-2	150		µg/kg	<150	<150	<150	<150
Benzo(k)fluoranthene	207-08-9	150		µg/kg	<150	<150	<150	<150
Benzo(a)pyrene	50-32-8	150		µg/kg	<150	<150	<150	<150
Indeno(1,2,3-cd)pyrene	193-39-5	150		µg/kg	<150	<150	<150	<150
Dibenz(a,h)anthracene	53-70-3	150		µg/kg	<150	<150	<150	<150
Benzo(g,h,i)perylene	191-24-2	150		µg/kg	<150	<150	<150	<150
Low M.W. PAHs	-----	550		µg/kg	<550	<550	<550	<550
High M.W. PAHs	-----	1700		µg/kg	<1700	<1700	<1700	<1700
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	32160-8	0.1	%		86.6	94.9	95.7	102
4-Terphenyl-d14	1718-510	0.1	%		84.7	97.3	93.8	97.4
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								
Decachlorobiphenyl	205124-3	0.1	%		65.5	69.6	67.2	70.1



Sub-Matrix: INTERSTITIAL WATER

Compound	CAS Number	LOR	Client sample ID			
			Client sampling date / time	Unit	µg TBT /L	
EP-390: Triorganotins Tributyltin	56573-85-4	0.015	SD4 0M-0.9M [06-FEB-2015]	SD4 0.9M-1.9M [06-FEB-2015]	SD4 1.9M-2.9M [06-FEB-2015]	SD4 2.9M-3.9M [06-FEB-2015]
			HK1505113-001	HK1505113-002	HK1505113-003	HK1505113-004
			<0.015	<0.015	<0.015	<0.015



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: 3819003)								
HK1504955-002	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	51.4	51.6	0.4
HK1505113-003	SD4 1.9M-2.9M	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	42.3	41.6	1.6
EG: Metals and Major Cations (QC Lot: 3819190)								
HK1504953-002	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	0.1	0.1	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	12	10	10.4
		EG020: Chromium	7440-47-3	1	mg/kg	27	26	0.0
		EG020: Copper	7440-50-8	1	mg/kg	12	12	0.0
		EG020: Lead	7439-92-1	1	mg/kg	43	43	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	16	16	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	89	84	6.0
HK1505107-004	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	0.1	0.1	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	16	16	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	23	23	0.0
		EG020: Copper	7440-50-8	1	mg/kg	10	10	0.0
		EG020: Lead	7439-92-1	1	mg/kg	26	27	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	16	16	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	63	62	0.0
EP-065: PCB Single Congeners (QC Lot: 3817755)								
HK1504955-002	Anonymous	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3817754)								



Matrix: SOIL		Laboratory Duplicate (DUP) Report		RPD (%)				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3817754) - Continued								
HK1504953-002	Anonymous	Fluoranthene	206-44-0	150	µg/kg	<150	<150	0.0
		Pyrene	129-00-0	150	µg/kg	<150	<150	0.0
		Benz(a)anthracene	56-55-3	150	µg/kg	<150	<150	0.0
		Chrysene	218-01-9	150	µg/kg	<150	<150	0.0
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	0.0
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	0.0
		Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	150	µg/kg	<150	<150	0.0
		Dibenz(a,h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g,h,i)perylene	191-24-2	150	µg/kg	<150	<150	0.0
		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 Duplicate (DUP) Report		RPD (%)				
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
HK1504953-001	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: SOIL										
Method Blank (MB) Report										
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Control Limit
EG: Metals and Major Cations (QC Lot: 3819190)										
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	96.1	76	112	76-112	-----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	93.3	79	111	79-111	-----
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	94.4	76	118	76-118	-----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	102	79	105	79-105	-----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	91.7	80	104	80-104	-----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	77.9	76	112	76-112	-----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	99.1	79	105	79-105	-----
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	85.8	76	106	76-106	-----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	97.7	76	114	76-114	-----
EP-065: PCB Single Congeners (QC Lot: 3817755)										
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	84.0	41	126	41-126	-----
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	83.4	36	118	36-118	-----
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	84.8	35	119	35-119	-----
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	88.5	26	124	26-124	-----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	87.2	26	124	26-124	-----



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	MS	MSD	Recovery Limits (%)	RPD (%)	
EG: Metals and Major Cations (QC Lot: 3819190)									
HK1504953-001	Anonymous								
		EG020: Arsenic	7440-38-2	5 mg/kg	89.5	-----	75	125	-----
		EG020: Cadmium	7440-43-9	5 mg/kg	94.0	-----	75	125	-----
		EG020: Chromium	7440-47-3	50 mg/kg	95.0	-----	75	125	-----
		EG020: Copper	7440-50-8	50 mg/kg	97.7	-----	75	125	-----
		EG020: Lead	7439-92-1	50 mg/kg	90.8	-----	75	125	-----
		EG020: Mercury	7439-97-6	0.1 mg/kg	84.2	-----	75	125	-----
		EG020: Nickel	7440-02-0	50 mg/kg	94.2	-----	75	125	-----
		EG020: Silver	7440-22-4	5 mg/kg	84.8	-----	75	125	-----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	-----	75	125	-----

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
				Spike Concentration	MS	MSD	Recovery Limits (%)	RPD (%)	
EP-390: Triorganotins (QC Lot: 3821359)									
HK1504953-001	Anonymous								
		Tributyltin	56573-85-4	2 ngSn/L	121	-----	70	130	-----

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



CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 5
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1505114
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 1/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 06-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 25-FEB-2015
C-O-C number	: H026560			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics



Page Number : 2 of 5
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1505114

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: 18-FEB-2015

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: **HK1505114**

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

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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



Page Number : 3 of 5
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505114

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time		Client sample ID			
			Unit	Unit	SD4 0M-0.9M [06-FEB-2015] HK1505114-001	SD4 0.9M-1.9M [06-FEB-2015] HK1505114-002	SD4 1.9M-2.9M [06-FEB-2015] HK1505114-003	SD4 2.9M-3.9M [06-FEB-2015] HK1505114-004
EAI/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	44.2	43.7	42.4	40.9	
ED/IEK: Inorganic Nonmetallic Parameters								
EK055: Ammonia as N	7664-417	0.1	mg/kg	8.8	7.3	5.9	4.5	
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	800	838	831	564	
EK067A: Total Phosphorus as P	----	1	mg/kg	424	430	477	384	
EP-067_SR-A: Organichlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
gamma-BHC	58-99-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
Endosulfan sulfate	103107-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	
EP-067_SR-S: Pesticide Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	83.2	84.0	84.8	93.6	
Dibutylchlorendate	1770-90-5	0.1	%	62.4	66.2	69.0	70.2	
								Surrogate control limits listed at end of this report.



Page Number : 4 of 5
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505114

Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Laboratory Duplicate (DUP) Report				RPD (%)
					Unit	Original Result	Duplicate Result	RPD (%)	
EA/ED: Physical and Aggregate Properties (QC Lot: 3818995)									
HK1504956-002	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	51.4	51.6	0.4	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824828)									
HK1504954-001	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	1400	1300	7.6	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824829)									
HK1505110-001	Anonymous	EK067A: Total Phosphorus as P	----	1	mg/kg	472	464	1.6	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825433)									
HK1504956-001	Anonymous	EK055: Ammonia as N	7664-41-7	0.1	mg/kg	9.3	10.3	10.4	
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3818196)									
HK1505110-001	Anonymous	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	0.0	
		beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	0.0	
		gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	0.0	
		delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	0.0	
		Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	0.0	
		Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	0.0	
		Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	0.0	
		Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	0.0	
		4.4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	0.0	
		4.4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	0.0	
		Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	0.0	
		4.4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	0.0	

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

Method: Compound	CAS Number	LOR	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report				
			Unit	Result	Concentration	Spike Concentration	LCS	Spike Recovery (%)	Recovery Limits (%)	Value	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3819000)										
EK057A: Nitrite as N (Sol)	----	0.1	mg/kg	<0.1	2 mg/kg	105	85	85	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824828)										
EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	103	85	85	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824829)										
EK067A: Total Phosphorus as P	----	20	mg/kg	<20	695 mg/kg	92.8	85	85	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825433)										
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	97.8	89	89	113	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3818196)										
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	77.6	55	55	106	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	71.6	37	37	123	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	71.4	43	43	112	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	104	64	64	113	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	74.0	42	42	113	-----
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	103	57	57	106	-----



Method: Compound	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	High	Value	RPD (%)	Control Limit
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3818196) - Continued													
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	86.6	-----	-----	61	108	-----	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	95.4	-----	-----	55	120	-----	-----	-----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	101	-----	-----	60	116	-----	-----	-----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	107	-----	-----	52	127	-----	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	92.6	-----	-----	56	120	-----	-----	-----
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	59.8	-----	-----	45	126	-----	-----	-----

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

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

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	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 10
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1505116
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Telephone	: ----	Telephone	: +852 2610 1044		
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Project	: AGREEMENT NO CEG3_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 06-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 25-FEB-2015
C-O-C number	: H026561-H026562			Nc. of samples received	: 5
Site	: ----			Nc. of samples analysed	: 5

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Signatories

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics

ALS Laboratory Group
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A Campbell Brothers Limited Company



Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1505116

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: 23-FEB-2015

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: **HK1505116**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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

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

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



Page Number : 3 of 10
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505116

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time		Unit	Client sample ID				
			Client sampling date / time	Unit		SD4 0M-0.9M [06-FEB-2015] HK1505116-001	SD4 0.9M-1.9M [06-FEB-2015] HK1505116-002	SD4 1.9M-2.9M [06-FEB-2015] HK1505116-003	SD4 2.9M-3.9M [06-FEB-2015] HK1505116-004	SD4 ELUTRIATE BLK [06-FEB-2015] HK1505116-005
EP-390: Triorganotins	56573-85-4	0.015	0.015	µg TBT /L	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Tributyltin					<0.015	<0.015	<0.015	<0.015	<0.015	<0.015



Compound	CAS Number	Client sample ID		SD4					SD4
		LOR	Unit	0M-0.9M [06-FEB-2015] HK1505116-001	0.9M-1.9M [06-FEB-2015] HK1505116-002	1.9M-2.9M [06-FEB-2015] HK1505116-003	2.9M-3.9M [06-FEB-2015] HK1505116-004	ELUTRIATE BLK [06-FEB-2015] HK1505116-005	
ED/EK: Inorganic Nonmetallic Parameters									
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	1.09	0.68	0.53	0.50	0.03	
EK057A: Nitrite as N	----	0.01	mg/L	0.06	<0.01	<0.01	<0.01	<0.01	
EK058A: Nitrate as N	14797-55-8	0.01	mg/L	0.07	0.14	0.22	0.11	0.09	
EK061P: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.6	1.3	1.0	0.9	0.3	
EK067P: Total Phosphorus as P	----	0.01	mg/L	0.16	0.20	0.12	0.08	<0.01	
EK071K: Reactive Phosphorus as P	14265-44-2	10	µg/L	110	160	90	60	<10	
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	2	2	2	2	2	
EG020: Lead	7439-92-1	1	µg/L	<1	1	<1	<1	<1	
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
EG020: Nickel	7440-02-0	1	µg/L	1	<1	<1	<1	<1	
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-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 44	41484-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	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	
PCB 153	35065-27-1	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 180	35065-29-3	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	
Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18	
EP-076HK: Polycyclic Aromatic 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	



Compound	Client sample ID		Client sampling date / time					
	CAS Number	LOR	Unit	SD4 0M-0.9M [06-FEB-2015] HK1505116-001	SD4 0.9M-1.9M [06-FEB-2015] HK1505116-002	SD4 1.9M-2.9M [06-FEB-2015] HK1505116-003	SD4 2.9M-3.9M [06-FEB-2015] HK1505116-004	SD4 ELUTRIATE BLK [06-FEB-2015] HK1505116-005
Sub-Matrix: ELUTRIATE								
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
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)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
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-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	103107-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	32150-8	0.1	%	59.3	53.2	66.4	51.3	61.2
4-Terphenyl-d14	1718-510	0.1	%	105	113	110	101	118
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	73.6	66.9	63.1	66.0	76.8
EP-067_SR-S: Pesticide Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	53.8	57.6	58.7	51.6	56.4
Dibutylchloroendate	1770-80-5	0.1	%	73.7	70.8	71.9	71.0	78.5



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505116

Laboratory Duplicate (DUP) Report

Matrix: WATER		Laboratory Duplicate (DUP) Report									
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)			
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 382669f)											
HK1505116-005	SD4 ELUTRIATE BLK	EK057A: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0			
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)											
HK1504952-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.96	0.91	5.3			
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)											
HK1504949-001	Anonymous	EK067P: Total Phosphorus as P	----	0.01	mg/L	0.06	0.05	0.0			
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)											
HK1504948-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.17	0.17	0.0			
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)											
Anonymous											
EG020: Cadmium											
			7440-43-9	0.2	µg/L	<0.2	<0.2	0.0			
EG020: Mercury											
			7439-97-6	0.5	µg/L	<0.5	<0.5	0.0			
EG020: Chromium											
			7440-47-3	1	µg/L	<1	<1	0.0			
EG020: Copper											
			7440-50-8	1	µg/L	2	1	0.0			
EG020: Lead											
			7439-92-1	1	µg/L	<1	<1	0.0			
EG020: Nickel											
			7440-02-0	1	µg/L	2	2	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			
EG020: Cadmium											
			7440-43-9	0.2	µg/L	<0.2	<0.2	0.0			
EG020: Mercury											
			7439-97-6	0.5	µg/L	<0.5	<0.5	0.0			
EG020: Chromium											
			7440-47-3	1	µg/L	<1	<1	0.0			
EG020: Copper											
			7440-50-8	1	µg/L	2	2	0.0			
EG020: Lead											
			7439-92-1	1	µg/L	<1	<1	0.0			
EG020: Nickel											
			7440-02-0	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	20	20	0.0			
EG020: Zinc											
			7440-66-6	10	µg/L	<10	<10	0.0			
EP-065A: PCB Single Congeners (QC Lot: 382844f)											
Anonymous											
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 44											
			41464-39-5	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 66											
			32598-10-0	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 101											
			37680-73-2	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 118											
			31508-00-6	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 128											
			38380-07-3	0.01	µg/L	<0.01	<0.01	0.0			
PCB 138											
			35065-28-2	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 169											
			32774-16-6	0.01	µg/L	<0.01	<0.01	0.0			



Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EP-065A: PCB Single Congeners (QC Lot: 3828441) - Continued								
HK1504957-006	Anonymous	PCB 170	35065-30-6	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 187	52663-68-0	0.01	µg/L	<0.01	<0.01	0.0
		Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824764)								
HK1505116-005	SD4 ELUTRIATE BLK	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
		Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	0.0
		Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	0.0
		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
		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-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828442)								
HK1504957-006	Anonymous	alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	0.0
		beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	0.0
		gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	0.0
		delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	0.0
		Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	0.0
EP-390: Triorganotins (QC Lot: 3829008)								
HK1504957-001	Anonymous	Tributyltin	56573-85-4	6	ngSn/L	<6	<6	0.0
EP-390: Triorganotins (QC Lot: 3829009)								
HK1505598-001	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
 Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report
 Method Blank (MB) Report



Matrix: WATER				Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report				
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Low	High	Value	RPD (%)	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)												
EK057A: Nitrite as N	-----	0.01	mg/L	<0.01	0.4 mg/L 0.05 mg/L	104 98.8	-----	98 88	112 114	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)												
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	106	-----	92	108	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)												
EK067P: Total Phosphorus as P	-----	0.01	mg/L	<0.01	0.5 mg/L	95.0	-----	91	103	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)												
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	-----	94	104	-----	-----	-----
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)												
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	112	-----	76	116	-----	-----	-----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	106	-----	81	109	-----	-----	-----
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	88.5	-----	80	112	-----	-----	-----
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	111	-----	79	115	-----	-----	-----
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	91.8	-----	82	108	-----	-----	-----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	100	-----	82	118	-----	-----	-----
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	106	-----	79	115	-----	-----	-----
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	89.7	-----	78	106	-----	-----	-----
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	91.5	-----	77	119	-----	-----	-----
EP-065A: PCB Single Congeners (QC Lot: 3828441)												
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	57.1	-----	50	130	-----	-----	-----
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	56.0	-----	50	130	-----	-----	-----
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	63.7	-----	50	130	-----	-----	-----
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	67.8	-----	50	130	-----	-----	-----
PCB 52	35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	64.2	-----	50	130	-----	-----	-----
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	86.6	-----	50	130	-----	-----	-----
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	87.5	-----	50	130	-----	-----	-----
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	75.0	-----	50	130	-----	-----	-----
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	88.0	-----	50	130	-----	-----	-----
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	85.5	-----	50	130	-----	-----	-----
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	90.9	-----	50	130	-----	-----	-----
PCB 128	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	90.7	-----	50	130	-----	-----	-----
PCB 138	35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	85.1	-----	50	130	-----	-----	-----
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	88.1	-----	50	130	-----	-----	-----
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	89.4	-----	50	130	-----	-----	-----
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	91.4	-----	50	130	-----	-----	-----
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	93.7	-----	50	130	-----	-----	-----
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	89.1	-----	50	130	-----	-----	-----
Total Polychlorinated biphenyls	-----	0.18	µg/L	<0.18	-----	-----	-----	-----	-----	-----	-----	-----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824764)												
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	60.0	-----	50	98	-----	-----	-----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	54.3	-----	47	97	-----	-----	-----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	55.3	-----	49	93	-----	-----	-----



Method : Compound	CAS Number	LOR	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
			Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824764) - Continued											
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	58.8	-----	52	92	-----	-----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	51.7	-----	51	91	-----	-----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	55.6	-----	48	95	-----	-----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	77.2	-----	68	109	-----	-----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	80.9	-----	69	111	-----	-----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	94.4	-----	64	119	-----	-----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	107	-----	50	124	-----	-----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	82.7	-----	54	124	-----	-----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	98.2	-----	54	130	-----	-----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	72.5	-----	60	120	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	70.4	-----	60	119	-----	-----
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	55.7	-----	48	120	-----	-----
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	54.9	-----	52	125	-----	-----
Low M.W. PAHs	-----	1.2	µg/L	<1.2	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	2.0	µg/L	<2.0	-----	-----	-----	-----	-----	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828442)											
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	73.4	-----	34	123	-----	-----
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	81.4	-----	55	128	-----	-----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	70.2	-----	45	118	-----	-----
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	90.4	-----	59	114	-----	-----
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	59.4	-----	42	104	-----	-----
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	83.0	-----	45	117	-----	-----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	74.4	-----	57	116	-----	-----
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	82.6	-----	55	120	-----	-----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	92.0	-----	63	122	-----	-----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	105	-----	54	134	-----	-----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	89.8	-----	67	123	-----	-----
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	56.0	-----	43	121	-----	-----
EP-390: Triorganotins (QC Lot: 3829008)											
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	96.8	-----	70	130	-----	-----
EP-390: Triorganotins (QC Lot: 3829009)											
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	99.2	-----	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	MS	MSD	Recovery Limits (%)	RPD (%)	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826691)									
HK1505116-005 SD4 ELUTRIATE BLK		EK057A: Nitrite as N	----	0.5 mg/L	94.0	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826743)									
HK1504952-001 Anonymous		EK055K: Ammonia as N	7664-41-7	0.5 mg/L	88.0	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827092)									
HK1504949-001 Anonymous		EK067P: Total Phosphorus as P	----	0.5 mg/L	97.5	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827683)									
HK1504948-001 Anonymous		EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	118	----	75	125	----
EG: Metals and Major Cations - Filtered (QC Lot: 3826668)									
HK1504957-001 Anonymous									
		EG020: Arsenic	7440-38-2	10 µg/L	92.7	----	75	125	----
		EG020: Cadmium	7440-43-9	10 µg/L	110	----	75	125	----
		EG020: Chromium	7440-47-3	10 µg/L	105	----	75	125	----
		EG020: Copper	7440-50-8	10 µg/L	99.8	----	75	125	----
		EG020: Lead	7439-92-1	10 µg/L	102	----	75	125	----
		EG020: Mercury	7439-97-6	0.2 µg/L	112	----	75	125	----
		EG020: Nickel	7440-02-0	10 µg/L	94.6	----	75	125	----
		EG020: Silver	7440-22-4	10 µg/L	79.3	----	75	125	----
		EG020: Zinc	7440-66-6	10 µg/L	103	----	75	125	----
EP-390: Triorganotins (QC Lot: 3829008)									
HK1504957-001 Anonymous		Tributyltin	56573-85-4	2 ngSn/L	100	----	70	130	----
EP-390: Triorganotins (QC Lot: 3829009)									
HK1505598-001 Anonymous		Tributyltin	56573-85-4	2 ngSn/L	112	----	70	130	----

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)
		Low High
Sub-Matrix: ELUTRIATE		
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
EP-067_SR-S: Pesticide Surrogate		
Tetrachlorometaxylene	877-09-8	50 130
Dibutylchlorendate	1770-80-5	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 9
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1505591
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 1/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
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Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 10-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 02-MAR-2015
C-O-C number	: H026587			No. of samples received	: 2
Site	: ----			No. of samples analysed	: 2

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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.

Authorised results for

Position

Chan Ka Yu, Karen
Wong Wing, Kenneth

Manager - Organics
Manager - Metals

Organics
Inorganics

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Page Number : 2 of 9
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1505591

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: 25-FEB-2015

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: HK1505591

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

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 D3974-09 based on ASTM D3974-09, prior to 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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		GB6	GB7
			Client sampling date / time	Unit		
EAVED: Physical and Aggregate Properties						
EA055: Moisture Content (dried @ 103° C)	----	0.1	%		28.1	23.9
EG: Metals and Major Cations						
EG020: Arsenic	7440-38-2	1	mg/kg		3	3
EG020: Cadmium	7440-43-9	0.2	mg/kg		<0.2	<0.2
EG020: Chromium	7440-47-3	1	mg/kg		11	8
EG020: Copper	7440-50-8	1	mg/kg		18	13
EG020: Lead	7439-92-1	1	mg/kg		16	12
EG020: Mercury	7439-97-6	0.05	mg/kg		<0.05	<0.05
EG020: Nickel	7440-02-0	1	mg/kg		5	4
EG020: Silver	7440-22-4	0.1	mg/kg		0.4	0.3
EG020: Zinc	7440-66-6	1	mg/kg		64	47
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	35663-99-3	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-076HK: 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



Compound	CAS Number	LOR	Client sample ID		GB6	GB7
			Client sampling date / time	Unit		
Sub-Matrix: SEDIMENT						
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued						
Fluoranthene	206-44-0	150			<150	<150
Pyrene	129-00-0	150			<150	<150
Benz(a)anthracene	56-55-3	150			<150	<150
Chrysene	218-01-9	150			<150	<150
Benzo(b)fluoranthene	205-99-2	150			<150	<150
Benzo(k)fluoranthene	207-08-9	150			<150	<150
Benzo(a)pyrene	50-32-8	150			<150	<150
Indeno(1,2,3-cd)pyrene	193-39-5	150			<150	<150
Dibenz(a,h)anthracene	53-70-3	150			<150	<150
Benzo(g,h,i)perylene	191-24-2	150			<150	<150
Low M.W. PAHs	----	550			<550	<550
High M.W. PAHs	----	1700			<1700	<1700
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates						
2-Fluorobiphenyl	32160-8	0.1		%	83.5	93.9
4-Terphenyl-d14	1718-51-0	0.1		%	90.4	99.2
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate						
Decachlorobiphenyl	2051-24-3	0.1		%	72.3	75.7
Surrogate control limits listed at end of this report.						
Surrogate control limits listed at end of this report.						



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505591

Compound	CAS Number	LOR	Client sample ID	
			Client sampling date / time	Unit
Sub-Matrix: INTERSTITIAL WATER				
EP-390: Triorganotins	56573-85-4	0.015	GB6 [10-FEB-2015]	GB7 [10-FEB-2015]
Tributyltin			HK1505591-001	HK1505591-002
			<0.015	<0.015



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505591

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: 3826405)									
HK1505591-001	GB6	EA055: Moisture Content (dried @ 103°C)		----	0.1	%	28.1	27.3	3.1
HK1506076-001	Anonymous	EA055: Moisture Content (dried @ 103°C)		----	0.1	%	5.4	5.8	5.9
EG: Metals and Major Cations (QC Lot: 3824749)									
HK1505448-002	Anonymous	EG020: Silver		7440-22-4	0.1	mg/kg	<0.1	<0.1	0.0
		EG020: Cadmium		7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Mercury		7439-97-6	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic		7440-38-2	1	mg/kg	1	1	0.0
		EG020: Chromium		7440-47-3	1	mg/kg	4	5	0.0
		EG020: Copper		7440-50-8	1	mg/kg	7	8	0.0
		EG020: Lead		7439-92-1	1	mg/kg	39	39	0.0
		EG020: Nickel		7440-02-0	1	mg/kg	2	2	0.0
		EG020: Zinc		7440-66-6	1	mg/kg	89	82	8.1
HK1505521-006	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	2.0	2.0	0.0
		EG020: Cadmium		7440-43-9	0.2	mg/kg	11.3	10.6	5.7
		EG020: Arsenic		7440-38-2	1	mg/kg	31	26	16.8
		EG020: Chromium		7440-47-3	1	mg/kg	145	134	7.5
		EG020: Copper		7440-50-8	1	mg/kg	287	289	0.7
		EG020: Lead		7439-92-1	1	mg/kg	61	61	0.0
		EG020: Nickel		7440-02-0	1	mg/kg	59	60	1.9
		EG020: Zinc		7440-66-6	1	mg/kg	3510	3520	0.1
EP-065: PCB Single Congeners (QC Lot: 3817755)									
HK1504955-002	Anonymous	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3821683)									



Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report									
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-065: PCB Single Congeners (QC Lot: 3817755) - Continued											
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	91.1	-----	24	125	-----	-----
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	79.4	-----	51	122	-----	-----
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	78.3	-----	46	122	-----	-----
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	79.2	-----	52	122	-----	-----
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	78.4	-----	50	123	-----	-----
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	82.3	-----	53	121	-----	-----
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	81.5	-----	54	124	-----	-----
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	78.9	-----	51	123	-----	-----
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	78.2	-----	51	124	-----	-----
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	83.2	-----	55	126	-----	-----
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	85.5	-----	58	124	-----	-----
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	84.0	-----	56	126	-----	-----
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	80.6	-----	51	123	-----	-----
Total Polychlorinated biphenyls -----											
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3821683)											
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	102	-----	68	107	-----	-----
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	101	-----	70	113	-----	-----
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	103	-----	68	108	-----	-----
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	106	-----	71	111	-----	-----
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	103	-----	71	110	-----	-----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	103	-----	63	117	-----	-----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	110	-----	72	113	-----	-----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	110	-----	72	112	-----	-----
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	102	-----	70	119	-----	-----
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	93.6	-----	79	112	-----	-----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	92.1	-----	68	125	-----	-----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	106	-----	75	113	-----	-----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	93.5	-----	64	118	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	82.3	-----	61	127	-----	-----
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	79.2	-----	66	112	-----	-----
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	83.7	-----	73	114	-----	-----
Low M.W. PAHs	-----	550	µg/kg	<550	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	1700	µg/kg	<1700	-----	-----	-----	-----	-----	-----	-----
Matrix: WATER											
Method Blank (MB) Report											
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-390: Triorganotins (QC Lot: 3829009)	56573-85-4	5	ngSn/L	<5	2 ngSn/L	99.2	-----	70	130	-----	-----
Tributyltin	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



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	MS	MSD	Recovery Limits (%)	RPD (%)		
				MS	MSD	Low	High	Value	Control Limit	
EG: Metals and Major Cations (QC Lot: 3824749)										
HK1505448-001	Anonymous									
		EG020: Arsenic	7440-38-2	5 mg/kg	86.4		75	125		
		EG020: Cadmium	7440-43-9	5 mg/kg	97.0		75	125		
		EG020: Chromium	7440-47-3	5 mg/kg	120		75	125		
		EG020: Copper	7440-50-8	5 mg/kg	95.2		75	125		
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined		75	125		
		EG020: Mercury	7439-97-6	0.1 mg/kg	75.4		75	125		
		EG020: Nickel	7440-02-0	5 mg/kg	106		75	125		
		EG020: Silver	7440-22-4	5 mg/kg	98.7		75	125		
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined		75	125		
Matrix: WATER										
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	MS	MSD	Low	High	Value	Control Limit
HK1505598-001	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	112		70	130		

Surrogate Control Limits

Compound	CAS Number	Low	High
Sub-Matrix: SEDIMENT			
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

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CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 5
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1505597
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 1/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 10-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 26-FEB-2015
C-O-C number	: H026588			No. of samples received	: 2
Site	: ----			No. of samples analysed	: 2

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics

Page Number : 2 of 5
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1505597



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:

25-FEB-2015

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: **HK1505597**

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

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

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.



Analytical Results

Compound	CAS Number	Client sampling date / time		GB6 [10-FEB-2015] HK1505597-001	GB7 [10-FEB-2015] HK1505597-002
		LOR	Unit		
EA/ED: Physical and Aggregate Properties					
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	28.1	23.9
ED/EK: Inorganic Nonmetallic Parameters					
EK055: Ammonia as N	7664-417	0.1	mg/kg	3.6	2.2
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	459	233
EK067A: Total Phosphorus as P	----	1	mg/kg	256	174
EP-067_SR-A: Organichlorine Pesticides (OC)					
alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50
beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50
gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50
delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50
Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50
Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50
Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50
4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50
4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50
4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50
EP-067_SR-S: Pesticide Surrogate					
Tetrachlorometaxylene	877-09-8	0.1	%	85.2	86.2
Dibutylchloroendate	1770-80-5	0.1	%	75.6	74.0
Surrogate control limits listed at end of this report.					



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3824012)								
HK1505597-001	GB6	EA055: Moisture Content (dried @ 103°C)	-----	0.1	%	28.1	27.3	3.1
HK1505597-002	GB7	EA055: Moisture Content (dried @ 103°C)	-----	0.1	%	23.9	24.4	1.9
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824828)								
HK1504954-001	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	-----	1	mg/kg	1400	1300	7.6
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824829)								
HK1505110-001	Anonymous	EK067A: Total Phosphorus as P	-----	1	mg/kg	472	464	1.6
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825433)								
HK1504956-001	Anonymous	EK055: Ammonia as N	7664-41-7	0.1	mg/kg	9.3	10.3	10.4
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3823173)								
HK1505597-001	GB6	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	0.0
		beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	0.0
		gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	0.0
		delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	0.0
		Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	0.0
		4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	0.0

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

Method: Compound	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824014)													
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	2 mg/kg	103	-----	-----	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824828)													
EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	103	-----	-----	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3824829)													
EK067A: Total Phosphorus as P	----	20	mg/kg	<20	695 mg/kg	92.8	-----	-----	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3825433)													
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	97.8	-----	-----	89	113	-----	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3823173)													
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	73.0	-----	-----	55	106	-----	-----	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	68.0	-----	-----	37	123	-----	-----	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	67.4	-----	-----	43	112	-----	-----	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	103	-----	-----	64	113	-----	-----	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	75.4	-----	-----	42	113	-----	-----	-----



Page Number : 5 of 5
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1505597

Method: Compound	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	RPD (%)	
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3823173) - Continued										
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	94.8	-----	57	106	-----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	89.6	-----	61	108	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	97.2	-----	55	120	-----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	104	-----	60	116	-----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	97.4	-----	52	127	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	96.2	-----	56	120	-----
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	60.2	-----	45	126	-----

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

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

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

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CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 10
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1505598
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		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com	Date Samples Received	: 10-FEB-2015
Telephone	: ----	Telephone	: +852 2610 1044	Issue Date	: 26-FEB-2015
Facsimile	: ----	Facsimile	: +852 2610 2021	No. of samples received	: 4
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	No. of samples analysed	: 4
Order number	: GE/2014/21.01				
C-O-C number	: H026589-H026590				
Site	: ----				

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Signatories

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics



Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1505598

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: 23-FEB-2015

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: **HK1505598**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

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.

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



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time		Client sample ID
			Unit	Unit	
EP-390: Triorganotins	56573-85-4	0.015	[10-FEB-2015]	[10-FEB-2015]	GB6
			HK1505598-001	HK1505598-002	GB7
Tributyltin			[10-FEB-2015]	[10-FEB-2015]	GB6
			HK1505598-003	HK1505598-004	GB7
					ELUTRIATE BLK
					ELUTRIATE BLK
					<0.015
					<0.015
					<0.015



Compound	Client sample ID		Client sampling date / time	Unit	GB6 [10-FEB-2015] HK1505598-001	GB7 [10-FEB-2015] HK1505598-002	GB6 [10-FEB-2015] HK1505598-003	GB7 [10-FEB-2015] HK1505598-004
	CAS Number	LOR						
	Sub-Matrix: ELUTRIATE							
ED/EK: Inorganic Nonmetallic Parameters								
EK055K: Ammonia as N	7664-11-7	0.01	mg/L	0.73	0.43	0.20	0.19	
EK057A: Nitrite as N	---	0.01	mg/L	<0.01	<0.01	0.02	0.01	
EK058A: Nitrate as N	14797-55-8	0.01	mg/L	0.01	0.04	0.47	0.36	
EK061P: Total Kjeldahl Nitrogen as N	---	0.1	mg/L	1.2	0.9	0.4	0.4	
EK067P: Total Phosphorus as P	---	0.01	mg/L	0.06	0.05	0.05	0.04	
EK071K: Reactive Phosphorus as P	14265-44-2	10	µg/L	20	10	30	20	
EG: Metals and Major Cations - Filtered								
EG020: Arsenic	7440-38-2	10	µg/L	<10	<10	<10	<10	
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	
EG020: Chromium	7440-47-3	1	µg/L	<1	<1	<1	<1	
EG020: Copper	7440-50-8	1	µg/L	1	2	2	2	
EG020: Lead	7439-92-1	1	µg/L	<1	<1	<1	<1	
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	
EG020: Nickel	7440-02-0	1	µg/L	1	1	1	<1	
EG020: Silver	7440-22-4	1	µg/L	3	<1	<1	<1	
EG020: Zinc	7440-66-6	10	µg/L	<10	<10	<10	<10	
EP-065A: PCB Single Congeners								
PCB 8	34883-43-7	0.01	µg/L	<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	
PCB 28	7012-37-5	0.01	µg/L	<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	
PCB 52	35693-99-3	0.01	µg/L	<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	
PCB 77	32598-13-3	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	
PCB 101	37680-73-2	0.01	µg/L	<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	
PCB 118	31508-00-6	0.01	µg/L	<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	
PCB 128	38380-07-3	0.01	µg/L	<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	
PCB 153	35065-27-1	0.01	µg/L	<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	
PCB 170	35065-30-6	0.01	µg/L	<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	
PCB 187	52663-68-0	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	
Total Polychlorinated biphenyls	---	0.18	µg/L	<0.18	<0.18	<0.18	<0.18	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	91-20-3	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	



Compound	CAS Number	LOR	Unit	Client sample ID		
				GB6	GB7	GB7
Client sampling date / time				[10-FEB-2015]	[10-FEB-2015]	[10-FEB-2015]
Sub-Matrix: ELUTRIATE				HK1505598-001	HK1505598-002	HK1505598-004
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued						
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)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2
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-067_SR-A: Organochlorine Pesticides (OC)						
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1
Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates						
2-Fluorobiphenyl	321-60-8	0.1	%	64.8	59.9	57.2
4-Terphenyl-d14	1718-510	0.1	%	129	119	116
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate						
Decachlorobiphenyl	205124-3	0.1	%	84.4	82.4	80.2
EP-067_SR-S: Pesticide Surrogate						
Tetrachlorometaxylene	877-09-8	0.1	%	53.8	53.0	52.4
Dibutylchlorendate	1770-80-5	0.1	%	89.6	82.8	81.2



Laboratory Duplicate (DUP) Report

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
Matrix: WATER									
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826695)									
HK1505992-001	Anonymous	----	EK057A: Nitrite as N		0.01	mg/L	136	130	4.5
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826745)									
HK1505875-001	Anonymous		EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.01	0.01	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827094)									
HK1505116-001	Anonymous	----	EK067P: Total Phosphorus as P		0.01	mg/L	0.16	0.16	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827684)									
HK1504952-001	Anonymous		EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.22	0.22	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3826669)									
HK1505598-002	GB7		EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
			EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
			EG020: Chromium	7440-47-3	1	µg/L	<1	<1	0.0
			EG020: Copper	7440-50-8	1	µg/L	2	2	0.0
			EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
			EG020: Nickel	7440-02-0	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: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
EP-065A: PCB Single Congeners (QC Lot: 3828443)									
HK1505116-005	Anonymous		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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
			PCB 138	35065-28-2	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 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
			PCB 180	35065-29-3	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
			Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824764)									
HK1505116-005	Anonymous		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



Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Laboratory Duplicate (DUP) Report			RPD (%)
					Original Result	Duplicate Result	Duplicate Result	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824764) - Continued								
HK1505116-005	Anonymous	Phenanthrene	85-01-8	0.2	<0.2	<0.2	<0.2	0.0
		Anthracene	120-12-7	0.2	<0.2	<0.2	<0.2	0.0
		Fluoranthene	206-44-0	0.2	<0.2	<0.2	<0.2	0.0
		Pyrene	129-00-0	0.2	<0.2	<0.2	<0.2	0.0
		Benz(a)anthracene	56-55-3	0.2	<0.2	<0.2	<0.2	0.0
		Chrysene	218-01-9	0.2	<0.2	<0.2	<0.2	0.0
		Benzo(b)fluoranthene	205-99-2	0.2	<0.2	<0.2	<0.2	0.0
		Benzo(k)fluoranthene	207-08-9	0.2	<0.2	<0.2	<0.2	0.0
		Benzo(a)pyrene	50-32-8	0.2	<0.2	<0.2	<0.2	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	0.2	<0.2	<0.2	<0.2	0.0
		Dibenz(a,h)anthracene	53-70-3	0.2	<0.2	<0.2	<0.2	0.0
		Benzo(g,h,i)perylene	191-24-2	0.2	<0.2	<0.2	<0.2	0.0
		Low M.W. PAHs	----	2.2	<2.2	<2.2	<2.2	0.0
		High M.W. PAHs	----	6.8	<6.8	<6.8	<6.8	0.0
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828444)								
HK1505116-005	Anonymous	alpha-BHC	319-84-6	0.1	<0.1	<0.1	<0.1	0.0
		beta-BHC	319-85-7	0.1	<0.1	<0.1	<0.1	0.0
		gamma-BHC	58-89-9	0.1	<0.1	<0.1	<0.1	0.0
		delta-BHC	319-86-8	0.1	<0.1	<0.1	<0.1	0.0
		Heptachlor	76-44-8	0.1	<0.1	<0.1	<0.1	0.0
		Aldrin	309-00-2	0.1	<0.1	<0.1	<0.1	0.0
		Heptachlor epoxide	1024-57-3	0.1	<0.1	<0.1	<0.1	0.0
		Endosulfan 1	959-98-8	0.1	<0.1	<0.1	<0.1	0.0
		4,4'-DDE	72-55-9	0.1	<0.1	<0.1	<0.1	0.0
		4,4'-DDD	72-54-8	0.1	<0.1	<0.1	<0.1	0.0
		Endosulfan sulfate	1031-07-8	0.1	<0.1	<0.1	<0.1	0.0
		4,4'-DDT	50-29-3	0.1	<0.1	<0.1	<0.1	0.0
EP-390: Triorganotins (QC Lot: 3829009)								
HK1505598-001	GB6	Tributyltin	56573-85-4	6	<6	<6	<6	0.0

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

Method: Compound	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826695)													
EK057A: Nitrite as N	----	0.01	mg/L	-----	0.4 mg/L	104	98	-----	98	112	-----	-----	-----
				<0.01	0.05 mg/L	98.0	88	-----	88	114	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826745)													
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.4 mg/L	104	92	-----	92	108	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827094)													
EK067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.5 mg/L	96.0	91	-----	91	103	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827684)													
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	99.6	94	-----	94	104	-----	-----	-----



Matrix: WATER

		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 3826669)														
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	112	-----	-----	76	116	-----	-----	-----	-----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	92.4	-----	-----	81	109	-----	-----	-----	-----
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	88.3	-----	-----	80	112	-----	-----	-----	-----
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	97.4	-----	-----	79	115	-----	-----	-----	-----
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	95.6	-----	-----	82	108	-----	-----	-----	-----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	109	-----	-----	82	118	-----	-----	-----	-----
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	97.4	-----	-----	79	115	-----	-----	-----	-----
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	102	-----	-----	78	106	-----	-----	-----	-----
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	112	-----	-----	77	119	-----	-----	-----	-----
EP-065A: PCB Single Congeners (QC Lot: 3828443)														
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	52.8	-----	-----	50	130	-----	-----	-----	-----
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	51.2	-----	-----	50	130	-----	-----	-----	-----
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	58.6	-----	-----	50	130	-----	-----	-----	-----
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	62.1	-----	-----	50	130	-----	-----	-----	-----
PCB 52	35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	59.0	-----	-----	50	130	-----	-----	-----	-----
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	77.7	-----	-----	50	130	-----	-----	-----	-----
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	97.0	-----	-----	50	130	-----	-----	-----	-----
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	85.7	-----	-----	50	130	-----	-----	-----	-----
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	97.3	-----	-----	50	130	-----	-----	-----	-----
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	95.0	-----	-----	50	130	-----	-----	-----	-----
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	100	-----	-----	50	130	-----	-----	-----	-----
PCB 128	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	101	-----	-----	50	130	-----	-----	-----	-----
PCB 138	35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	94.9	-----	-----	50	130	-----	-----	-----	-----
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	98.9	-----	-----	50	130	-----	-----	-----	-----
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	98.4	-----	-----	50	130	-----	-----	-----	-----
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	101	-----	-----	50	130	-----	-----	-----	-----
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	101	-----	-----	50	130	-----	-----	-----	-----
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	102	-----	-----	50	130	-----	-----	-----	-----
Total Polychlorinated biphenyls	-----	0.18	µg/L	<0.18	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824764)														
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	60.0	-----	-----	50	98	-----	-----	-----	-----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	54.3	-----	-----	47	97	-----	-----	-----	-----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	55.3	-----	-----	49	93	-----	-----	-----	-----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	58.8	-----	-----	52	92	-----	-----	-----	-----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	51.7	-----	-----	51	91	-----	-----	-----	-----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	55.6	-----	-----	48	95	-----	-----	-----	-----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	77.2	-----	-----	68	109	-----	-----	-----	-----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	80.9	-----	-----	69	111	-----	-----	-----	-----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	94.4	-----	-----	64	119	-----	-----	-----	-----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	107	-----	-----	50	124	-----	-----	-----	-----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	82.7	-----	-----	54	124	-----	-----	-----	-----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	98.2	-----	-----	54	130	-----	-----	-----	-----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	72.5	-----	-----	60	120	-----	-----	-----	-----



Matrix: WATER		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3824764) - Continued														
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	70.4	-----	-----	60	60	119	-----	-----	-----
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	55.7	-----	-----	48	48	120	-----	-----	-----
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	54.9	-----	-----	52	52	125	-----	-----	-----
Low M.W. PAHs	-----	1.2	µg/L	<1.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	2.0	µg/L	<2.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3828444)														
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	69.4	-----	-----	34	34	123	-----	-----	-----
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	78.4	-----	-----	55	55	128	-----	-----	-----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	66.8	-----	-----	45	45	118	-----	-----	-----
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	79.8	-----	-----	59	59	114	-----	-----	-----
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	53.6	-----	-----	42	42	104	-----	-----	-----
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	72.6	-----	-----	45	45	117	-----	-----	-----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	66.0	-----	-----	57	57	116	-----	-----	-----
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	73.4	-----	-----	55	55	120	-----	-----	-----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	71.6	-----	-----	63	63	122	-----	-----	-----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	94.0	-----	-----	54	54	134	-----	-----	-----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	81.6	-----	-----	67	67	123	-----	-----	-----
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	54.8	-----	-----	43	43	121	-----	-----	-----
EP-390: Triorganotin (QC Lot: 3829009)														
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	99.2	-----	-----	70	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	MS	MSD	Recovery Limits (%)	RPD (%)	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826695)									
HK1505992-001	Anonymous	EK057A: Nitrite as N	----	500 mg/L	104	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3826745)									
HK1505875-001	Anonymous	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	98.0	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827094)									
HK1505116-001	Anonymous	EK067P: Total Phosphorus as P	----	0.5 mg/L	112	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3827684)									
HK1504952-001	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	106	----	75	125	----
EG: Metals and Major Cations - Filtered (QC Lot: 38266669)									
HK1505598-001 GB6									
		EG020: Arsenic	7440-38-2	10 µg/L	99.9	----	75	125	----
		EG020: Cadmium	7440-43-9	10 µg/L	107	----	75	125	----
		EG020: Chromium	7440-47-3	10 µg/L	101	----	75	125	----
		EG020: Copper	7440-50-8	10 µg/L	96.4	----	75	125	----
		EG020: Lead	7439-92-1	10 µg/L	98.0	----	75	125	----
		EG020: Mercury	7439-97-6	0.2 µg/L	108	----	75	125	----
		EG020: Nickel	7440-02-0	10 µg/L	98.8	----	75	125	----
		EG020: Silver	7440-22-4	10 µg/L	109	----	75	125	----
		EG020: Zinc	7440-66-6	10 µg/L	124	----	75	125	----
EP-390: Triorganotins (QC Lot: 3829009)									
HK1505598-001	GB6	Tributyltin	56573-85-4	2 ngSn/L	112	----	70	130	----

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: ELUTRIATE			
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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	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 9
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1506963
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 1/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 25-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 11-MAR-2015
C-O-C number	: H026594			No. of samples received	: 5
Site	: ----			No. of samples analysed	: 5

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Hong Kong Accreditation Service (HKAS) has accredited 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

Chan Ka Yu, Karen
Wong Wing, Kenneth

Position

Manager - Organics
Manager - Metals

Authorised results for

Organics
Inorganics



Page Number : 2 of 9
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1506963

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: 10-MAR-2015

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: **HK1506963**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction. Sample(s) were received in an ambient 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 D3974-09 based on ASTM D3974-09, prior to determination of metals.

Analysis of Tributyltin in interstitial water was cancelled due to insufficient volume of interstitial water except Sample #2 SD6 0.9M-1.9M, Sample #3 SD6 1.9M-2.9M and Sample #4 SD6 2.9M-3.9M.

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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sampling date / time	Client sample ID							
				SD6 0M-0.9M [25-FEB-2015] HK1506963-001	SD6 0.9M-1.9M [25-FEB-2015] HK1506963-002	SD6 1.9M-2.9M [25-FEB-2015] HK1506963-003	SD6 2.9M-3.9M [25-FEB-2015] HK1506963-004	SD6 5.9M-6.9M [25-FEB-2015] HK1506963-005			
EAI/ED: Physical and Aggregate Properties											
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	15.8	19.9	19.6	17.3	32.1			
EG: Metals and Major Cations											
EG020: Arsenic	7440-38-2	1	mg/kg	2	2	3	5	6			
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	4	7	8	9	54			
EG020: Copper	7440-50-8	1	mg/kg	2	3	3	4	12			
EG020: Lead	7439-92-1	1	mg/kg	5	8	11	15	34			
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05			
EG020: Nickel	7440-02-0	1	mg/kg	2	3	4	4	19			
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1			
EG020: Zinc	7440-66-6	1	mg/kg	14	23	29	32	66			
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-076HK: 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			



Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Unit	Client sample ID					
				SD6 0M-0.9M [25-FEB-2015] HK1506963-001	SD6 0.9M-1.9M [25-FEB-2015] HK1506963-002	SD6 1.9M-2.9M [25-FEB-2015] HK1506963-003	SD6 2.9M-3.9M [25-FEB-2015] HK1506963-004	SD6 5.9M-6.9M [25-FEB-2015] HK1506963-005	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued									
Anthracene	120-12-7	50	µg/kg	<50	<50	<50	<50	<50	<50
Fluoranthene	206-44-0	150	µg/kg	<150	<150	<150	<150	<150	<150
Pyrene	129-00-0	150	µg/kg	<150	<150	<150	<150	<150	<150
Benzo(a)anthracene	56-55-3	150	µg/kg	<150	<150	<150	<150	<150	<150
Chrysene	218-01-9	150	µg/kg	<150	<150	<150	<150	<150	<150
Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	<150	<150	<150	<150
Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	<150	<150	<150	<150
Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	<150	<150	<150	<150
Indeno(1,2,3-cd)pyrene	193-39-5	150	µg/kg	<150	<150	<150	<150	<150	<150
Dibenz(a,h)anthracene	53-70-3	150	µg/kg	<150	<150	<150	<150	<150	<150
Benzo(g,h,i)perylene	191-24-2	150	µg/kg	<150	<150	<150	<150	<150	<150
Low M.W. PAHs	----	550	µg/kg	<550	<550	<550	<550	<550	<550
High M.W. PAHs	----	1700	µg/kg	<1700	<1700	<1700	<1700	<1700	<1700
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
2-Fluorobiphenyl	32160-8	0.1	%	110	104	101	114	108	108
4-Terphenyl-d14	1718-51-0	0.1	%	117	108	105	119	114	114
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate									
Decachlorobiphenyl	205124-3	0.1	%	53.9	51.5	52.0	60.5	62.7	62.7



Page Number : 5 of 9
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1506963

Sub-Matrix: INTERSTITIAL WATER

Compound	CAS Number	LOR	Client sample ID		
			Client sampling date / time	Unit	Unit
EP-390: Triorganotins Tributyltin	56573-85-4	0.015	0.9M-1.9M [25-FEB-2015]	1.9M-2.9M [25-FEB-2015]	2.9M-3.9M [25-FEB-2015]
			HK1506963-002	HK1506963-003	HK1506963-004
			<0.015	<0.015	<0.015



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EATED: Physical and Aggregate Properties (QC Lot: 3841543)								
HK1506728-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	9.5	9.3	2.1
EG: Metals and Major Cations (QC Lot: 3847192)								
HK1506935-001	Anonymous	EG020: Silver	7440-22-4	0.1	mg/kg	0.2	0.2	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.4	0.4	0.0
		EG020: Mercury	7439-97-6	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	<1	<1	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	5	5	0.0
		EG020: Copper	7440-50-8	1	mg/kg	159	162	2.1
		EG020: Lead	7439-92-1	1	mg/kg	16	14	11.1
		EG020: Nickel	7440-02-0	1	mg/kg	6	6	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	158	164	3.6
HK1507057-002	Anonymous	EG020: Mercury	7439-97-6	0.05	mg/kg	0.09	0.09	0.0
		EG020: Silver	7440-22-4	0.1	mg/kg	0.7	0.6	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	0.2	0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	14	16	11.0
		EG020: Chromium	7440-47-3	1	mg/kg	16	16	0.0
		EG020: Copper	7440-50-8	1	mg/kg	34	35	3.6
		EG020: Lead	7439-92-1	1	mg/kg	44	45	0.0
		EG020: Nickel	7440-02-0	1	mg/kg	9	9	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	123	122	0.0
EP-065: PCB Single Congeners (QC Lot: 3841875)								
HK1507035-001	Anonymous	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3838396)								
HK1506555-001	Anonymous	High M.W. PAHs	----	1700	µg/kg	<1700	<1700	0.0



Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
Matrix: SOIL									
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3838396) - Continued									
HK1506555-001		Anonymous	Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
			Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
			Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
			Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
			Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
			Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
			Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
			Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
			Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
			Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
			Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
			Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
			Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
			Indeno(1,2,3-cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
			Dibenz(a,h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
			Benzo(g,h,i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
			Low M.W. PAHs	----	550	µg/kg	<550	<550	0.0

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
Matrix: WATER									
EP-390: Triorganotins (QC Lot: 3851050)									
HK1507060-001		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

Method Blank (MB) Report											
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	RPD (%)
EG: Metals and Major Cations (QC Lot: 3847192)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	93.5	76	112	76 - 112	-----	-----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	93.0	79	111	79 - 111	-----	-----
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	98.8	76	118	76 - 118	-----	-----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	94.8	79	105	79 - 105	-----	-----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	93.3	80	104	80 - 104	-----	-----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	95.8	76	112	76 - 112	-----	-----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	88.8	79	105	79 - 105	-----	-----
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	93.4	76	106	76 - 106	-----	-----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	112	76	114	76 - 114	-----	-----
EP-065: PCB Single Congeners (QC Lot: 3841875)											
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	77.9	41	126	41 - 126	-----	-----
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	74.9	36	118	36 - 118	-----	-----
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	80.6	35	119	35 - 119	-----	-----
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	82.4	26	124	26 - 124	-----	-----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	81.9	26	124	26 - 124	-----	-----
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	83.4	24	125	24 - 125	-----	-----



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 (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-065: PCB Single Congeners (QC Lot: 3841875) - Continued													
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	78.5	-----	51	122	-----	-----	-----	-----
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	76.7	-----	46	122	-----	-----	-----	-----
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	79.3	-----	52	122	-----	-----	-----	-----
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	77.4	-----	50	123	-----	-----	-----	-----
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	83.1	-----	53	121	-----	-----	-----	-----
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	81.0	-----	54	124	-----	-----	-----	-----
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	78.0	-----	51	123	-----	-----	-----	-----
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	78.1	-----	51	124	-----	-----	-----	-----
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	88.1	-----	55	126	-----	-----	-----	-----
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	87.4	-----	58	124	-----	-----	-----	-----
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	84.8	-----	56	126	-----	-----	-----	-----
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	78.9	-----	51	123	-----	-----	-----	-----
Total Polychlorinated biphenyls													
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3838396)													
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	89.5	-----	68	107	-----	-----	-----	-----
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	99.0	-----	70	113	-----	-----	-----	-----
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	92.3	-----	68	108	-----	-----	-----	-----
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	98.6	-----	71	111	-----	-----	-----	-----
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	91.6	-----	71	110	-----	-----	-----	-----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	93.6	-----	63	117	-----	-----	-----	-----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	96.8	-----	72	113	-----	-----	-----	-----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	96.7	-----	72	112	-----	-----	-----	-----
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	94.9	-----	70	119	-----	-----	-----	-----
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	82.0	-----	79	112	-----	-----	-----	-----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	100	-----	68	125	-----	-----	-----	-----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	93.4	-----	75	113	-----	-----	-----	-----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	95.8	-----	64	118	-----	-----	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	101	-----	61	127	-----	-----	-----	-----
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	85.4	-----	66	112	-----	-----	-----	-----
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	102	-----	73	114	-----	-----	-----	-----
Low M.W. PAHs	-----	550	µg/kg	<550	-----	-----	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	1700	µg/kg	<1700	-----	-----	-----	-----	-----	-----	-----	-----	-----
Matrix: WATER													
Method Blank (MB) Report													
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-390: Triorganotins (QC Lot: 3851050)	56573-85-4	5	ngSn/L	<5	2 ngSn/L	107	-----	70	130	-----	-----	-----	-----
Tributyltin	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----



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	MS	MSD	Recovery Limits (%)	RPD (%)	
EG: Metals and Major Cations (QC Lot: 3847192)				Low	High	Value	Control Limit		
HK1506934-001	Anonymous	EG020: Arsenic	7440-38-2	5 mg/kg	90.0	-----	75	125	-----
		EG020: Cadmium	7440-43-9	5 mg/kg	92.9	-----	75	125	-----
		EG020: Chromium	7440-47-3	5 mg/kg	84.6	-----	75	125	-----
		EG020: Copper	7440-50-8	5 mg/kg	79.7	-----	75	125	-----
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	-----	75	125	-----
		EG020: Mercury	7439-97-6	1 mg/kg	84.5	-----	75	125	-----
		EG020: Nickel	7440-02-0	5 mg/kg	80.4	-----	75	125	-----
		EG020: Silver	7440-22-4	5 mg/kg	88.3	-----	75	125	-----
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	-----	75	125	-----

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
				Spike Concentration	MS	MSD	Recovery Limits (%)	RPD (%)	
EP-390: Triorganotins (QC Lot: 3851050)				Low	High	Value	Control Limit		
HK1507060-002	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	108	-----	70	130	-----

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
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

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CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 5
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1506971
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 1/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 25-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 12-MAR-2015
C-O-C number	: H026593			No. of samples received	: 5
Site	: ----			No. of samples analysed	: 5

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics



Page Number : 2 of 5
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1506971

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: 10-MAR-2015

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: **HK1506971**

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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

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



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	Client sample ID		Client sampling date / time				
		LOR	Unit	SD6 0M-0.9M [25-FEB-2015] HK1506971-001	SD6 0.9M-1.9M [25-FEB-2015] HK1506971-002	SD6 1.9M-2.9M [25-FEB-2015] HK1506971-003	SD6 2.9M-3.9M [25-FEB-2015] HK1506971-004	SD6 5.9M-6.9M [25-FEB-2015] HK1506971-005
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	15.8	18.0	21.4	17.3	32.1
ED/EEK: Inorganic Nonmetallic Parameters								
EK055: Ammonia as N	7664-41-7	0.1	mg/kg	<0.1	<0.1	1.9	2.0	8.1
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg	0.1	0.2	0.1	0.2	0.1
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	44	110	201	99	608
EK067A: Total Phosphorus as P	----	1	mg/kg	62	109	125	92	184
EP-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	103107-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50
EP-067_SR-S: Pesticide Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	90.6	76.4	75.6	81.6	82.4
Dibutylchlorodate	1770-90-5	0.1	%	93.6	78.0	76.4	84.8	85.6
				Surrogate control limits listed at end of this report.				



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report				RPD (%)
				LOR	Unit	Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3841540)								
HK1506971-001	SD6 0M-0.9M	EA055: Moisture Content (dried @ 103°C)	-----	0.1	%	15.8	16.1	1.5
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849042)								
HK1506971-001	SD6 0M-0.9M	EK055: Ammonia as N	7664-41-7	0.1	mg/kg	<1.0	<1.0	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849671)								
HK1506971-005	SD6 5.9M-6.9M	EK061A: Total Kjeldahl Nitrogen as N	-----	1	mg/kg	608	551	9.9
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849672)								
HK1506971-005	SD6 5.9M-6.9M	EK067A: Total Phosphorus as P	-----	1	mg/kg	184	168	9.2
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3842194)								
HK1506971-001	SD6 0M-0.9M	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	0.0
		beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	0.0
		gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	0.0
		delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	0.0
		Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	0.0
		Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	0.0
		4.4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	0.0
		4.4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	0.0
		Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	0.0
		4.4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	0.0

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

Method: Compound	CAS Number	LOR	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
			Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3841541)											
EK057A: Nitrite as N (Sol.)	-----	0.1	mg/kg	<0.1	2 mg/kg	104	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849042)											
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	100	89	113	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849671)											
EK061A: Total Kjeldahl Nitrogen as N	-----	20	mg/kg	<20	1000 mg/kg	97.5	85	115	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849672)											
EK067A: Total Phosphorus as P	-----	20	mg/kg	<20	695 mg/kg	92.4	85	115	-----	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3842194)											
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	90.6	55	106	-----	-----	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	91.8	37	123	-----	-----	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	91.2	43	112	-----	-----	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	93.4	64	113	-----	-----	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	93.0	42	113	-----	-----	-----
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	91.8	57	106	-----	-----	-----



Method Blank (MB) Report

Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Matrix: SOIL

Method: Compound	CAS Number	LOR	Unit	Result	Spike Recovery (%)		Recovery Limits (%)		Value	RPD (%)	Control Limit
					LCS	DCS	Low	High			
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3842194) - Continued											
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	94.0	-----	61	108	-----	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	94.2	-----	55	120	-----	-----	-----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	94.0	-----	60	116	-----	-----	-----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	95.0	-----	52	127	-----	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	97.4	-----	56	120	-----	-----	-----
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	96.4	-----	45	126	-----	-----	-----

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

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

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

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CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 13
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1506978
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Telephone	: ----	Telephone	: +852 2610 1044		
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Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 25-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 12-MAR-2015
C-O-C number	: H026591-H026592			No. of samples received	: 6
Site	: ----			No. of samples analysed	: 6

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Signatories

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics

ALS Laboratory Group

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Page Number : 2 of 13
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1506978

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:

11-MAR-2015

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: **HK1506978**

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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

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

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



Page Number : 3 of 13
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1506978

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID	Client sampling date / time	
				Unit	Unit
EP-390: Triorganofins Tributyltin	56573-85-4	0.015	µg TBT/L	SD6	SD6
				0M-0.9M	0M-0.9M
				0.9M-1.9M	0.9M-1.9M
				1.9M-2.9M	1.9M-2.9M
				2.9M-3.9M	2.9M-3.9M
				SD6	SD6
				5.9M-6.9M	5.9M-6.9M
				[25-FEB-2015]	[25-FEB-2015]
				HK1506978-001	HK1506978-005
				<0.015	<0.015
				<0.015	<0.015
				<0.015	<0.015
				<0.015	<0.015
				<0.015	<0.015



Page Number : 4 of 13
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1506978

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Sub-Matrix: SEDIMENT		Client sample ID	Client sampling date / time	LOR	Unit	CAS Number	Unit
		SD6	ELUTRIATE BLK				
			[25-FEB-2015]				
			HK1506978-006				
Compound							
EP-390: Triorganotins				0.015	µg TBT /L	56573-85-4	<0.015
Tributyltin							



Compound	CAS Number	LOR	Client sample ID		SD6 0M-0.9M [25-FEB-2015] HK1506978-001	SD6 0.9M-1.9M [25-FEB-2015] HK1506978-002	SD6 1.9M-2.9M [25-FEB-2015] HK1506978-003	SD6 2.9M-3.9M [25-FEB-2015] HK1506978-004	SD6 5.9M-6.9M [25-FEB-2015] HK1506978-005
			Client sampling date / time	Unit					
Sub-Matrix: ELUTRIATE									
ED/EK: Inorganic Nonmetallic Parameters									
EK055K: Ammonia as N	7664-41-7	0.01	mg/L		0.16	0.17	0.42	0.66	0.88
EK057A: Nitrite as N	----	0.01	mg/L		<0.01	0.01	0.02	0.02	0.02
EK058A: Nitrate as N	14797-55-8	0.01	mg/L		0.32	0.30	0.31	0.30	0.33
EK061P: Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.5	0.5	0.8	1.1	1.4
EK067P: Total Phosphorus as P	----	0.01	mg/L		0.03	0.04	0.08	0.09	<0.01
EK071K: Reactive Phosphorus as P	14265-44-2	10	µg/L		20	30	60	80	<10
EG: Metals and Major Cations - Filtered									
EG020: Arsenic	7440-38-2	10	µg/L		<10	<10	<10	40	<10
EG020: Cadmium	7440-43-9	0.2	µg/L		0.6	<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	2
EG020: Lead	7439-92-1	1	µg/L		<1	<1	<1	1	<1
EG020: Mercury	7439-97-6	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
EG020: Nickel	7440-02-0	1	µg/L		3	1	1	2	2
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-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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	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
PCB 153	35065-27-1	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 180	35065-29-3	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
Total Polychlorinated biphenyls	----	0.18	µg/L		<0.18	<0.18	<0.18	<0.18	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	9120-3	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



CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Sub-Matrix: ELUTRIATE

Compound	CAS Number	LOR	Unit	Client sample ID				
				SD6 0M-0.9M [25-FEB-2015] HK1506978-001	SD6 0.9M-1.9M [25-FEB-2015] HK1506978-002	SD6 1.9M-2.9M [25-FEB-2015] HK1506978-003	SD6 2.9M-3.9M [25-FEB-2015] HK1506978-004	SD6 5.9M-6.9M [25-FEB-2015] HK1506978-005
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued								
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	85-018	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	218-019	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
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-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates								
2-Fluorobiphenyl	32160-8	0.1	%	54.4	59.1	51.3	50.6	52.4
4-Terphenyl-d14	1718-510	0.1	%	78.0	104	93.8	101	97.4
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate								
Decachlorobiphenyl	205124-3	0.1	%	55.9	59.8	53.8	58.2	60.8
EP-067_SR-S: Pesticide Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%	52.0	54.3	53.8	52.5	50.9
Dibutylchlorendate	1770-80-5	0.1	%	81.7	87.2	85.7	85.5	80.2



Compound	CAS Number	LOR	Client sample ID		SD6
			Client sampling date / time	Unit	
Sub-Matrix: ELUTRIATE					
ELUTRIATE BLK [25-FEB-2015] HK1506978-006					
ED/EK: Inorganic Nonmetallic Parameters					
EK055K: Ammonia as N	7664-417	0.01		mg/L	0.18
EK057A: Nitrite as N	----	0.01		mg/L	0.01
EK058A: Nitrate as N	14797-55-8	0.01		mg/L	0.30
EK061P: Total Kjeldahl Nitrogen as N	----	0.1		mg/L	0.5
EK067P: Total Phosphorus as P	----	0.01		mg/L	0.04
EK071K: Reactive Phosphorus as P	14265-44-2	10		µg/L	40
EG: Metals and Major Cations - Filtered					
EG020: Arsenic	7440-38-2	10		µg/L	<10
EG020: Cadmium	7440-43-9	0.2		µg/L	<0.2
EG020: Chromium	7440-47-3	1		µg/L	<1
EG020: Copper	7440-50-8	1		µg/L	3
EG020: Lead	7439-92-1	1		µg/L	<1
EG020: Mercury	7439-97-6	0.5		µg/L	<0.5
EG020: Nickel	7440-02-0	1		µg/L	1
EG020: Silver	7440-22-4	1		µg/L	<1
EG020: Zinc	7440-66-6	10		µg/L	<10
EP-065A: PCB Single Congeners					
PCB 8	34883-43-7	0.01		µg/L	<0.01
PCB 18	37680-65-2	0.01		µg/L	<0.01
PCB 28	7012-37-5	0.01		µg/L	<0.01
PCB 44	41464-39-5	0.01		µg/L	<0.01
PCB 52	35693-99-3	0.01		µg/L	<0.01
PCB 66	32598-10-0	0.01		µg/L	<0.01
PCB 77	32598-13-3	0.01		µg/L	<0.01
PCB 101	37680-73-2	0.01		µg/L	<0.01
PCB 105	32598-14-4	0.01		µg/L	<0.01
PCB 118	31508-00-6	0.01		µg/L	<0.01
PCB 126	57465-28-8	0.01		µg/L	<0.01
PCB 128	38380-07-3	0.01		µg/L	<0.01
PCB 138	35065-28-2	0.01		µg/L	<0.01
PCB 153	35065-27-1	0.01		µg/L	<0.01
PCB 169	32774-16-6	0.01		µg/L	<0.01
PCB 170	35065-30-6	0.01		µg/L	<0.01
PCB 180	35065-29-3	0.01		µg/L	<0.01
PCB 187	52863-68-0	0.01		µg/L	<0.01
Total Polychlorinated biphenyls	----	0.18		µg/L	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)					
Naphthalene	91-20-3	0.2		µg/L	<0.2
Acenaphthylene	208-96-8	0.2		µg/L	<0.2



Sub-Matrix: ELUTRIATE		Client sample ID		SD6
Compound	CAS Number	LOR	Unit	ELUTRIATE BLK [25-FEB-2015] HK1506978-006
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued				
Acenaphthene	83-32-9	0.2	µg/L	<0.2
Fluorene	86-73-7	0.2	µg/L	<0.2
Phenanthrene	85-018	0.2	µg/L	<0.2
Anthracene	120-12-7	0.2	µg/L	<0.2
Fluoranthene	206-44-0	0.2	µg/L	<0.2
Pyrene	129-00-0	0.2	µg/L	<0.2
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2
Chrysene	218-019	0.2	µg/L	<0.2
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2
Low M.W. PAHs	****	2.2	µg/L	<2.2
High M.W. PAHs	****	6.8	µg/L	<6.8
EP-067_SR-A: Organochlorine Pesticides (OC)				
alpha-BHC	319-84-6	0.1	µg/L	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1
4.4' -DDE	72-55-9	0.1	µg/L	<0.1
4.4' -DDD	72-54-8	0.1	µg/L	<0.1
Endosulfan sulfate	103107-8	0.1	µg/L	<0.1
4.4' -DDT	50-29-3	0.1	µg/L	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates				
2-Fluorobiphenyl	32160-8	0.1	%	68.3
4-Terphenyl-d14	1718-510	0.1	%	100
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate				
Decachlorobiphenyl	205124-3	0.1	%	71.4
EP-067_SR-S: Pesticide Surrogate				
Tetrachlorometaxylene	877-09-8	0.1	%	70.8
Dibutylchlorodate	1770-80-5	0.1	%	91.5

Surrogate control limits listed at end of this report.

Surrogate control limits listed at end of this report.

Surrogate control limits listed at end of this report.



Laboratory Duplicate (DUP) Report

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
Matrix: WATER									
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3841609)									
HK1506962-001	Anonymous		EK057A: Nitrite as N	-----	0.01	mg/L	0.02	0.02	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849122)									
HK1506978-006	SD6 ELUTRIATE BLK		EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.04	0.04	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849124)									
HK1507060-005	Anonymous		EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.26	0.25	5.1
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3853117)									
HK1506978-001	SD6 0M-0.9M		EK067P: Total Phosphorus as P	-----	0.01	mg/L	0.03	0.03	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3850140)									
HK1506978-002	SD6 0.9M-1.9M		EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	0.2	0.0
			EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	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	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: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
			EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
			EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
			EG020: Chromium	7440-47-3	1	µg/L	<1	<1	0.0
			EG020: Copper	7440-50-8	1	µg/L	5	5	0.0
			EG020: Lead	7439-92-1	1	µg/L	<1	<1	0.0
			EG020: Nickel	7440-02-0	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: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
EP-065A: PCB Single Congeners (QC Lot: 3845615)									
HK1506978-006	SD6 ELUTRIATE BLK		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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
			PCB 138	35065-28-2	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 169	32774-16-6	0.01	µg/L	<0.01	<0.01	0.0



Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Laboratory Duplicate (DUP) Report		RPD (%)
					Original Result	Duplicate Result	
EP-065A: PCB Single Congeners (QC Lot: 3845615) - Continued							
HK1506978-006	SD6 ELUTRIATE BLK	PCB 170	35065-30-6	0.01	<0.01	<0.01	0.0
		PCB 180	35065-29-3	0.01	<0.01	<0.01	0.0
		PCB 187	52663-68-0	0.01	<0.01	<0.01	0.0
		Total Polychlorinated biphenyls	-----	0.18	<0.18	<0.18	0.0
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3845616)							
HK1506978-006	SD6 ELUTRIATE BLK	alpha-BHC	319-84-6	0.1	<0.1	<0.1	0.0
		beta-BHC	319-85-7	0.1	<0.1	<0.1	0.0
		gamma-BHC	58-89-9	0.1	<0.1	<0.1	0.0
		delta-BHC	319-86-8	0.1	<0.1	<0.1	0.0
		Heptachlor	76-44-8	0.1	<0.1	<0.1	0.0
		Aldrin	309-00-2	0.1	<0.1	<0.1	0.0
		Heptachlor epoxide	1024-57-3	0.1	<0.1	<0.1	0.0
		Endosulfan 1	959-98-8	0.1	<0.1	<0.1	0.0
		4.4'-DDE	72-55-9	0.1	<0.1	<0.1	0.0
		4.4'-DDD	72-54-8	0.1	<0.1	<0.1	0.0
		Endosulfan sulfate	1031-07-8	0.1	<0.1	<0.1	0.0
		4.4'-DDT	50-29-3	0.1	<0.1	<0.1	0.0
EP-390: Triorganotins (QC Lot: 3851050)							
HK1507060-001	Anonymous	Tributyltin	56573-85-4	6	<6	<6	0.0

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

Method: Compound	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3841609)													
EK057A: Nitrite as N	-----	0.01	mg/L	<0.01	0.05 mg/L	99.4	88	114	88	114	-----	-----	-----
				-----	0.4 mg/L	105	98	112	98	112	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849122)													
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	94	104	94	104	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849124)													
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	96.5	92	108	92	108	-----	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3853117)													
EK067P: Total Phosphorus as P	-----	0.01	mg/L	<0.01	0.5 mg/L	100	91	103	91	103	-----	-----	-----
EG: Metals and Major Cations - Filtered (QC Lot: 3850140)													
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	108	76	116	76	116	-----	-----	-----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	104	81	109	81	109	-----	-----	-----
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	100	80	112	80	112	-----	-----	-----
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	98.2	79	115	79	115	-----	-----	-----
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	90.6	82	108	82	108	-----	-----	-----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	88.5	82	118	82	118	-----	-----	-----
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	111	79	115	79	115	-----	-----	-----
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	98.0	78	106	78	106	-----	-----	-----



Matrix: WATER		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 3850140) - Continued													
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	118	-----	-----	77	77	119	-----	-----
EP-065A: PCB Single Congeners (QC Lot: 3845615)													
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	74.6	-----	-----	50	50	130	-----	-----
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	80.8	-----	-----	50	50	130	-----	-----
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	81.0	-----	-----	50	50	130	-----	-----
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	92.0	-----	-----	50	50	130	-----	-----
PCB 52	35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	92.1	-----	-----	50	50	130	-----	-----
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	84.8	-----	-----	50	50	130	-----	-----
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	114	-----	-----	50	50	130	-----	-----
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	119	-----	-----	50	50	130	-----	-----
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	117	-----	-----	50	50	130	-----	-----
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	119	-----	-----	50	50	130	-----	-----
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	108	-----	-----	50	50	130	-----	-----
PCB 138	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	118	-----	-----	50	50	130	-----	-----
PCB 178	35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	118	-----	-----	50	50	130	-----	-----
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	119	-----	-----	50	50	130	-----	-----
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	103	-----	-----	50	50	130	-----	-----
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	110	-----	-----	50	50	130	-----	-----
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	115	-----	-----	50	50	130	-----	-----
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	122	-----	-----	50	50	130	-----	-----
Total Polychlorinated biphenyls													
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3845550)													
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	85.6	-----	-----	50	50	98	-----	-----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	83.5	-----	-----	47	47	97	-----	-----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	84.2	-----	-----	49	49	93	-----	-----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	87.4	-----	-----	52	52	92	-----	-----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	85.3	-----	-----	51	51	91	-----	-----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	77.0	-----	-----	48	48	95	-----	-----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	92.4	-----	-----	68	68	109	-----	-----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	92.0	-----	-----	69	69	111	-----	-----
Benzo(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	93.8	-----	-----	64	64	119	-----	-----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	99.0	-----	-----	50	50	124	-----	-----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	85.0	-----	-----	54	54	124	-----	-----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	93.4	-----	-----	54	54	130	-----	-----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	79.4	-----	-----	60	60	120	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	70.3	-----	-----	60	60	119	-----	-----
Dibenzo(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	68.6	-----	-----	48	48	120	-----	-----
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	71.9	-----	-----	52	52	125	-----	-----
Low M.W. PAHs	-----	1.2	µg/L	<1.2	-----	-----	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	2.0	µg/L	<2.0	-----	-----	-----	-----	-----	-----	-----	-----	-----
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3845616)													
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	80.4	-----	-----	34	34	123	-----	-----
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	87.4	-----	-----	55	55	128	-----	-----



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 (%)	Recovery Limits (%)	Value	Control Limit
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3845616) - Continued									
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	83.8	45	118	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	88.0	59	114	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	82.8	42	104	----
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	81.4	45	117	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	86.8	57	116	----
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	87.4	55	120	----
4.4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	88.6	63	122	----
4.4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	87.4	54	134	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	93.8	67	123	----
4.4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	98.2	43	121	----
EP-390: Triorganotins (QC Lot: 3851050)									
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	107	70	130	----

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

Method: Compound				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery (%)	MSD	Recovery Limits (%)	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3841609)									
HK1506962-001 Anonymous		EK057A: Nitrite as N	----	0.5 mg/L	112	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849122)									
HK1506978-006 SD6 ELUTRIATE BLK		EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	107	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849124)									
HK1507060-005 Anonymous		EK055K: Ammonia as N	7664-41-7	0.5 mg/L	106	----	75	125	----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3853117)									
HK1506978-001 SD6 0M-0.9M		EK067P: Total Phosphorus as P	----	0.5 mg/L	96.0	----	75	125	----
EG: Metals and Major Cations - Filtered (QC Lot: 3850140)									
HK1506978-001 SD6 0M-0.9M		EG020: Arsenic	7440-38-2	10 µg/L	102	----	75	125	----
		EG020: Cadmium	7440-43-9	10 µg/L	110	----	75	125	----
		EG020: Chromium	7440-47-3	10 µg/L	123	----	75	125	----
		EG020: Copper	7440-50-8	10 µg/L	92.4	----	75	125	----
		EG020: Lead	7439-92-1	10 µg/L	105	----	75	125	----
		EG020: Mercury	7439-97-6	0.2 µg/L	112	----	75	125	----
		EG020: Nickel	7440-02-0	10 µg/L	98.4	----	75	125	----
		EG020: Silver	7440-22-4	10 µg/L	97.4	----	75	125	----
		EG020: Zinc	7440-66-6	10 µg/L	109	----	75	125	----
EP-390: Triorganotins (QC Lot: 3851050)									
HK1507060-002 Anonymous		Tributyltin	56573-85-4	2 ngSn/L	108	----	70	130	----



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Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1506978

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: ELUTRIATE			
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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

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EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026595
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Page : 1 of 9
Work Order : HK1507057

Date Samples Received : 26-FEB-2015
Issue Date : 14-MAR-2015
No. of samples received : 4
No. of samples analysed : 4

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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

Chan Ka Yu, Karen
Wong Wing, Kenneth

Position

Manager - Organics
Manager - Metals

Authorised results for

Organics
Inorganics



Page Number : 2 of 9
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order HK1507057

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: 10-MAR-2015

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: HK1507057

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.
Sample(s) were received in an ambient 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 D3974-09 based on ASTM D3974-09, prior to 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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	SD8 0M-0.9M [26-FEB-2015] HK1507057-001	SD8 0.9M-1.9M [26-FEB-2015] HK1507057-002	SD8 1.9M-2.9M [26-FEB-2015] HK1507057-003	SD8 2.9M-3.9M [26-FEB-2015] HK1507057-004
EA/ED: Physical and Aggregate Properties							
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	51.6	49.1	17.6	21.1
EG: Metals and Major Cations							
EG020: Arsenic	7400-38-2	1	mg/kg	18	14	7	<1
EG020: Cadmium	7440-43-9	0.2	mg/kg	0.2	0.2	<0.2	<0.2
EG020: Chromium	7440-47-3	1	mg/kg	18	16	10	3
EG020: Copper	7440-50-8	1	mg/kg	36	34	5	1
EG020: Lead	7439-92-1	1	mg/kg	49	44	25	1020
EG020: Mercury	7439-97-6	0.05	mg/kg	0.10	0.09	<0.05	<0.05
EG020: Nickel	7440-02-0	1	mg/kg	10	9	4	<1
EG020: Silver	7440-22-4	0.1	mg/kg	0.8	0.7	<0.1	<0.1
EG020: Zinc	7440-66-6	1	mg/kg	139	123	25	25
EP-065: PCB Single Congeners							
PCB 8	34863-43-7	3	µg/kg	<3	<3	<3	<3
PCB 18	37680-65-2	3	µg/kg	<3	<3	<3	<3
PCB 28	7012-37-5	3	µg/kg	<3	<3	<3	<3
PCB 44	41464-39-5	3	µg/kg	<3	<3	<3	<3
PCB 52	35693-99-3	3	µg/kg	<3	<3	<3	<3
PCB 66	32598-10-0	3	µg/kg	<3	<3	<3	<3
PCB 77	32598-13-3	3	µg/kg	<3	<3	<3	<3
PCB 101	37680-73-2	3	µg/kg	<3	<3	<3	<3
PCB 105	32598-14-4	3	µg/kg	<3	<3	<3	<3
PCB 118	31508-00-6	3	µg/kg	<3	<3	<3	<3
PCB 126	57465-28-8	3	µg/kg	<3	<3	<3	<3
PCB 128	38380-07-3	3	µg/kg	<3	<3	<3	<3
PCB 138	35065-28-2	3	µg/kg	<3	<3	<3	<3
PCB 153	35065-27-1	3	µg/kg	<3	<3	<3	<3
PCB 169	32774-16-6	3	µg/kg	<3	<3	<3	<3
PCB 170	35065-30-6	3	µg/kg	<3	<3	<3	<3
PCB 180	35065-29-3	3	µg/kg	<3	<3	<3	<3
PCB 187	52663-68-0	3	µg/kg	<3	<3	<3	<3
Total Polychlorinated biphenyls	----	18	µg/kg	<18	<18	<18	<18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)							
Naphthalene	9120-3	50	µg/kg	<50	<50	<50	<50
Acenaphthylene	208-96-8	50	µg/kg	<50	<50	<50	<50
Acenaphthene	83-32-9	50	µg/kg	<50	<50	<50	<50
Fluorene	86-73-7	50	µg/kg	<50	<50	<50	<50
Phenanthrene	85-01-8	50	µg/kg	<50	<50	<50	<50



Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Unit	Client sample ID			
				Client sampling date / time	SD8	SD8	SD8
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued							
Anthracene	120-12-7	50	µg/kg	<50	<50	<50	<50
Fluoranthene	206-44-0	150	µg/kg	<150	<150	<150	<150
Pyrene	129-00-0	150	µg/kg	<150	<150	<150	<150
Benz(a)anthracene	56-55-3	150	µg/kg	<150	<150	<150	<150
Chrysene	218-01-9	150	µg/kg	<150	<150	<150	<150
Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	<150	<150
Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	<150	<150
Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	<150	<150
Indeno(1,2,3-cd)pyrene	193-39-5	150	µg/kg	<150	<150	<150	<150
Dibenz(a,h)anthracene	53-70-3	150	µg/kg	<150	<150	<150	<150
Benzo(g,h,i)perylene	191-24-2	150	µg/kg	<150	<150	<150	<150
Low M.W. PAHs	----	550	µg/kg	<550	<550	<550	<550
High M.W. PAHs	----	1700	µg/kg	<1700	<1700	<1700	<1700
EP-076S: Polycyclic Aromatic Hydrocarbons (PAHs) Surrogates							Surrogate control limits listed at end of this report.
2-Fluorobiphenyl	32160-8	0.1	%	97.7	98.1	103	96.8
4-Terphenyl-d14	1718-510	0.1	%	97.8	94.9	102	98.4
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate							Surrogate control limits listed at end of this report.
Decachlorobiphenyl	205124-3	0.1	%	54.7	69.8	57.0	68.1



Sub-Matrix: INTERSTITIAL WATER

Compound	CAS Number	LOR	Client sample ID				
			Client sampling date / time	SD8	SD8	SD8	
EP-390: Triorganotins Tributyltin	56573-85-4	0.015	0M-0.9M [26-FEB-2015]	0M-0.9M [26-FEB-2015]	0.9M-1.9M [26-FEB-2015]	1.9M-2.9M [26-FEB-2015]	2.9M-3.9M [26-FEB-2015]
			HK1507057-001	HK1507057-002	HK1507057-003	HK1507057-004	
			<0.015	<0.015	<0.015	<0.015	
			µg TBT / L	µg TBT / L	µg TBT / L	µg TBT / L	



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report		RPD (%)
				Original Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3845293)						
HK1507057-001	SD8 0M-0.9M	EA055: Moisture Content (dried @ 103°C)	-----	51.6	51.6	0.0
HK1507295-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	9.5	9.8	3.4
EG: Metals and Major Cations (QC Lot: 3847192)						
HK1506935-001	Anonymous	EG020: Silver	7440-22-4	0.2	0.2	0.0
		EG020: Cadmium	7440-43-9	0.4	0.4	0.0
		EG020: Mercury	7439-97-6	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	<1	<1	0.0
		EG020: Chromium	7440-47-3	5	5	0.0
		EG020: Copper	7440-50-8	159	162	2.1
		EG020: Lead	7439-92-1	16	14	11.1
		EG020: Nickel	7440-02-0	6	6	0.0
		EG020: Zinc	7440-66-6	158	164	3.6
HK1507057-002	SD8 0.9M-1.9M	EG020: Mercury	7439-97-6	0.05	0.09	0.0
		EG020: Silver	7440-22-4	0.1	0.7	0.0
		EG020: Cadmium	7440-43-9	0.2	0.2	0.0
		EG020: Arsenic	7440-38-2	1	14	11.0
		EG020: Chromium	7440-47-3	1	16	0.0
		EG020: Copper	7440-50-8	1	34	3.6
		EG020: Lead	7439-92-1	1	44	0.0
		EG020: Nickel	7440-02-0	1	9	0.0
		EG020: Zinc	7440-66-6	1	123	0.0
EP-065: PCB Single Congeners (QC Lot: 3841875)						
HK1507035-001	Anonymous	Total Polychlorinated biphenyls	-----	<18	<18	0.0
		PCB 8	34883-43-7	<3	<3	0.0
		PCB 18	37680-65-2	<3	<3	0.0
		PCB 28	7012-37-5	<3	<3	0.0
		PCB 44	41464-39-5	<3	<3	0.0
		PCB 52	35693-99-3	<3	<3	0.0
		PCB 66	32598-10-0	<3	<3	0.0
		PCB 77	32598-13-3	<3	<3	0.0
		PCB 101	37680-73-2	<3	<3	0.0
		PCB 105	32598-14-4	<3	<3	0.0
		PCB 118	31508-00-6	<3	<3	0.0
		PCB 126	57465-28-8	<3	<3	0.0
		PCB 128	38380-07-3	<3	<3	0.0
		PCB 138	35065-28-2	<3	<3	0.0
		PCB 153	35065-27-1	<3	<3	0.0
		PCB 169	32774-16-6	<3	<3	0.0
		PCB 170	35065-30-6	<3	<3	0.0
		PCB 180	35065-29-3	<3	<3	0.0
		PCB 187	52663-68-0	<3	<3	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3838396)						



Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report		RPD (%)
						Original Result	Duplicate Result	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3838396) - Continued								
HK1506555-001	Anonymous	High M.W. PAHs	----	1700				
		Naphthalene	91-20-3	500	µg/kg	<1700	<1700	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a,h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g,h,i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
		Low M.W. PAHs	----	550	µg/kg	<550	<550	0.0

Matrix: WATER								
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-390: Triorganotin (QC Lot: 3851050)								
HK1507060-001	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: SOIL											
Method Blank (MB) Report											
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 3847192)											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	93.5	76	112	76	112	-----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	93.0	79	111	79	111	-----
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	98.8	76	118	76	118	-----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	94.8	79	105	79	105	-----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	93.3	80	104	80	104	-----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	95.8	76	112	76	112	-----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	88.8	79	105	79	105	-----
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	93.4	76	106	76	106	-----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	112	76	114	76	114	-----
EP-065: PCB Single Congeners (QC Lot: 3841875)											
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	77.9	41	126	41	126	-----
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	74.9	36	118	36	118	-----
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	80.6	35	119	35	119	-----
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	82.4	26	124	26	124	-----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	81.9	26	124	26	124	-----



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 Recovery (%)			Recovery Limits (%)			RPD (%)
					LCS	DCS	High	Low	High	Value		Control Limit
EP-065: PCB Single Congeners (QC Lot: 3841875) - Continued											
PCB 66	32598-10-0	3	µg/kg	<3	83.4	-----	24	125	-----	-----	
PCB 77	32598-13-3	3	µg/kg	<3	78.5	-----	51	122	-----	-----	
PCB 101	37680-73-2	3	µg/kg	<3	76.7	-----	46	122	-----	-----	
PCB 105	32598-14-4	3	µg/kg	<3	79.3	-----	52	122	-----	-----	
PCB 118	31508-00-6	3	µg/kg	<3	77.4	-----	50	123	-----	-----	
PCB 126	57465-28-8	3	µg/kg	<3	83.1	-----	53	121	-----	-----	
PCB 128	38380-07-3	3	µg/kg	<3	81.0	-----	54	124	-----	-----	
PCB 138	35065-28-2	3	µg/kg	<3	78.0	-----	51	123	-----	-----	
PCB 153	35065-27-1	3	µg/kg	<3	78.1	-----	51	124	-----	-----	
PCB 169	32774-16-6	3	µg/kg	<3	88.1	-----	55	126	-----	-----	
PCB 170	35065-30-6	3	µg/kg	<3	87.4	-----	58	124	-----	-----	
PCB 180	35065-29-3	3	µg/kg	<3	84.8	-----	56	126	-----	-----	
PCB 187	52663-68-0	3	µg/kg	<3	78.9	-----	51	123	-----	-----	
Total Polychlorinated biphenyls	-----	18	µg/kg	<18	-----	-----	-----	-----	-----	-----	

EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3838396)

Naphthalene	91-20-3	25	µg/kg	<50	89.5	-----	68	107	-----	-----
Acenaphthylene	208-96-8	25	µg/kg	<50	99.0	-----	70	113	-----	-----
Acenaphthene	83-32-9	25	µg/kg	<50	92.3	-----	68	108	-----	-----
Fluorene	86-73-7	25	µg/kg	<50	98.6	-----	71	111	-----	-----
Phenanthrene	85-01-8	25	µg/kg	<50	91.6	-----	71	110	-----	-----
Anthracene	120-12-7	25	µg/kg	<50	93.6	-----	63	117	-----	-----
Fluoranthene	206-44-0	25	µg/kg	<50	96.8	-----	72	113	-----	-----
Pyrene	129-00-0	25	µg/kg	<50	96.7	-----	72	112	-----	-----
Benz(a)anthracene	56-55-3	25	µg/kg	<50	94.9	-----	70	119	-----	-----
Chrysene	218-01-9	25	µg/kg	<50	82.0	-----	79	112	-----	-----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	100	-----	68	125	-----	-----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	93.4	-----	75	113	-----	-----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	95.8	-----	64	118	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	101	-----	61	127	-----	-----
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	85.4	-----	66	112	-----	-----
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	102	-----	73	114	-----	-----
Low M.W. PAHs	-----	550	µg/kg	<550	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	1700	µg/kg	<1700	-----	-----	-----	-----	-----	-----

Method Blank (MB) Report

Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Method: Compound	CAS Number	LOR	Unit	Result	Spike Recovery (%)			Recovery Limits (%)			RPD (%)
					LCS	DCS	High	Low	High	Value		Control Limit
EP-390: Triorganotins (QC Lot: 3851050)											
Tributyltin	56573-85-4	5	ngSn/L	<5	107	-----	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 Recovery (%)				RPD (%)
				MS	MSD	Low	High		Value	Control Limit
EG: Metals and Major Cations (QC Lot: 3847192)								
HK1506934-001	Anonymous							
		EG020: Arsenic	7440-38-2	90.0	-----	75	125	-----
		EG020: Cadmium	7440-43-9	92.9	-----	75	125	-----
		EG020: Chromium	7440-47-3	84.6	-----	75	125	-----
		EG020: Copper	7440-50-8	79.7	-----	75	125	-----
		EG020: Lead	7439-92-1	# Not Determined	-----	75	125	-----
		EG020: Mercury	7439-97-6	84.5	-----	75	125	-----
		EG020: Nickel	7440-02-0	80.4	-----	75	125	-----
		EG020: Silver	7440-22-4	88.3	-----	75	125	-----
		EG020: Zinc	7440-66-6	# Not Determined	-----	75	125	-----

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike Recovery (%)				RPD (%)
				MS	MSD	Low	High		Value	Control Limit
EP-390: Triorganofins (QC Lot: 3851050)								
HK1507060-002	Anonymous							
		Tributyltin	56573-85-4	108	-----	70	130	-----

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

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ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 5
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1507058
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E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 26-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 12-MAR-2015
C-O-C number	: H026595			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position

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General Manager

Authorised results for

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Page Number : 2 of 5
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1507058

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: 10-MAR-2015

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: **HK1507058**

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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

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



Analytical Results

Compound	CAS Number	Client sample ID		SD8 0M-0.9M [26-FEB-2015] HK1507058-001	SD8 0.9M-1.9M [26-FEB-2015] HK1507058-002	SD8 1.9M-2.9M [26-FEB-2015] HK1507058-003	SD8 2.9M-3.9M [26-FEB-2015] HK1507058-004
		LOR	Unit				
EA/ED: Physical and Aggregate Properties							
EA055: Moisture Content (dried @ 103° C)	----	0.1	%	51.6	49.1	17.6	21.1
ED/EK: Inorganic Nonmetallic Parameters							
EK055: Ammonia as N	7664-417	0.1	mg/kg	7.8	6.5	<1.0	<1.0
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg	0.3	0.2	<0.1	0.1
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	1200	1030	102	23
EK067A: Total Phosphorus as P	----	1	mg/kg	417	395	81	360
EP-067_SR-A: Organochlorine Pesticides (OC)							
alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
gamma-BHC	56-89-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	103107-8	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50
EP-067_SR-S: Pesticide Surrogate							
Tetrachlorometaxylene	877-09-8	0.1	%	79.0	73.4	83.0	77.8
Dibutylchloroendate	1770-80-5	0.1	%	76.2	73.2	86.0	81.0
				Surrogate control limits listed at end of this report.			



Laboratory Duplicate (DUP) Report

Matrix: SOIL		Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EA/ED: Physical and Aggregate Properties (QC Lot: 3845270)							
HK1507058-001	SD8 0M-0.9M	----	0.1	%	51.6	51.6	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849042)							
HK1506971-001	Anonymous	7664-41-7	0.1	mg/kg	<1.0	<1.0	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849671)							
HK1506971-005	Anonymous	----	1	mg/kg	608	551	9.9
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849672)							
HK1506971-005	Anonymous	----	1	mg/kg	184	168	9.2
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3843907)							
HK1507058-001	SD8 0M-0.9M						
	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	0.0
	beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	0.0
	gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	0.0
	delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	0.0
	Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	0.0
	Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	0.0
	Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	0.0
	Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	0.0
	4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	0.0
	4,4'-DDD	1031-07-8	0.50	mg/kg	<0.50	<0.50	0.0
	Endosulfan sulfate	50-29-3	0.50	mg/kg	<0.50	<0.50	0.0
	4,4'-DDT						

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

Matrix: SOIL		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report											
Method: Compound		Method Blank (MB) Report					Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3845284)													
EK057A: Nitrite as N(Sol.)	----	0.1	mg/kg	<0.1	2 mg/kg	106	85	115	85	115	106	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849042)													
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	100	89	113	89	113	100	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849671)													
EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	97.5	85	115	85	115	97.5	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849672)													
EK067A: Total Phosphorus as P	----	20	mg/kg	<20	695 mg/kg	92.4	85	115	85	115	92.4	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3843907)													
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	89.0	55	106	55	106	89.0	-----	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	89.0	37	123	37	123	89.0	-----	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	89.0	43	112	43	112	89.0	-----	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	90.6	64	113	64	113	90.6	-----	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	90.0	42	113	42	113	90.0	-----	-----
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	88.2	57	106	57	106	88.2	-----	-----



Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report									
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	High	Low	Value	Control Limit
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3843907) - Continued													
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	90.8	-----	-----	61	108	-----	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	90.4	-----	-----	55	120	-----	-----	-----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	91.2	-----	-----	60	116	-----	-----	-----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	92.6	-----	-----	52	127	-----	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	93.2	-----	-----	56	120	-----	-----	-----
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	91.4	-----	-----	45	126	-----	-----	-----

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

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

Surrogate Control Limits

Sub-Matrix: SEDIMENT	Compound	CAS Number	Recovery Limits (%)	
			Low	High
	EP-067_SR-S: Pesticide Surrogate			
	Tetrachlorometaxylene	877-09-8	50	130
	Dibutylchlorendate	1770-80-5	50	130

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ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 10
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1507060
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Telephone	: ----	Telephone	: +852 2610 1044		
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Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 26-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 12-MAR-2015
C-O-C number	: H026596			No. of samples received	: 5
Site	: ----			No. of samples analysed	: 5

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Signatories

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Fung Lim Chee, Richard

Manager - Organics
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Position

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Inorganics

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Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1507060

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: 11-MAR-2015

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: **HK1507060**

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.
Sample(s) were received in an ambient condition.

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

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

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



Page Number : 3 of 10
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1507060

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	Client sampling date / time		Client sample ID					
		LOR	Unit	SD8	SD8				
EP-390: Triorganotins Tributyltin	56573-85-4	0.015	µg TBT/L	0M-0.9M [26-FEB-2015]	0M-0.9M [26-FEB-2015]	0M-0.9M [26-FEB-2015]	0M-0.9M [26-FEB-2015]	0M-0.9M [26-FEB-2015]	0M-0.9M [26-FEB-2015]
				HK1507060-001	HK1507060-002	HK1507060-003	HK1507060-004	HK1507060-005	
				<0.015	<0.015	<0.015	<0.015	<0.015	



Page Number : 4 of 10
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1507060

Compound	Client sample ID		LOR	Unit	SD8 0M-0.9M [26-FEB-2015] HK1507060-001	SD8 0.9M-1.9M [26-FEB-2015] HK1507060-002	SD8 1.9M-2.9M [26-FEB-2015] HK1507060-003	SD8 2.9M-3.9M [26-FEB-2015] HK1507060-004	SD8 ELUTRIATE BLK [26-FEB-2015] HK1507060-005
	CAS Number	Client sampling date / time							
ED/EK: Inorganic Nonmetallic Parameters									
EK055K: Ammonia as N	7664-41-7		0.01	mg/L	0.53	0.71	0.34	0.28	0.26
EK057A: Nitrite as N	---		0.01	mg/L	0.03	0.03	0.10	0.02	0.02
EK058A: Nitrate as N	14797-55-8		0.01	mg/L	0.17	0.13	0.32	0.40	0.37
EK061P: Total Kjeldahl Nitrogen as N	---		0.1	mg/L	1.0	1.1	0.6	0.6	0.5
EK067P: Total Phosphorus as P	---		0.01	mg/L	0.04	0.04	0.03	<0.01	0.05
EK071K: Reactive Phosphorus as P	14265-44-2		10	µg/L	10	20	<10	<10	40
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	3	3	4	5	5
EG020: Lead	7439-92-1		1	µg/L	<1	<1	<1	<1	<1
EG020: Mercury	7439-97-6		0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EG020: Nickel	7440-02-0		1	µg/L	1	1	2	2	1
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-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 44	41464-39-5		0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 52	35693-98-3		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
PCB 77	32598-13-3		0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 101	37680-73-2		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 118	31508-00-6		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 128	38380-07-3		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
PCB 153	35065-27-1		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 180	35065-29-3		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
Total Polychlorinated biphenyls	---		0.18	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)									
Naphthalene	9120-3		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



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Sub-Matrix: ELUTRIATE

Compound	Client sample ID		SD8 0M-0.9M [26-FEB-2015] HK1507060-001	SD8 0.9M-1.9M [26-FEB-2015] HK1507060-002	SD8 1.9M-2.9M [26-FEB-2015] HK1507060-003	SD8 2.9M-3.9M [26-FEB-2015] HK1507060-004	SD8 ELUTRIATE BLK [26-FEB-2015] HK1507060-005
	CAS Number	Unit					
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued							
Acenaphthene	83-32-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2
Fluorene	86-73-7	0.2	µg/L	<0.2	<0.2	<0.2	<0.2
Phenanthrene	85-01-8	0.2	µg/L	<0.2	<0.2	<0.2	<0.2
Anthracene	120-12-7	0.2	µg/L	<0.2	<0.2	<0.2	<0.2
Fluoranthene	206-44-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2
Pyrene	129-00-0	0.2	µg/L	<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
Chrysene	218-01-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	50-32-8	0.2	µg/L	<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
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<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
Low M.W. PAHs	----	2.2	µg/L	<2.2	<2.2	<2.2	<2.2
High M.W. PAHs	----	6.8	µg/L	<6.8	<6.8	<6.8	<6.8
EP-067_SR-A: Organochlorine Pesticides (OC)							
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
Aldrin	308-00-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	103107-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							
2-Fluorobiphenyl	32160-8	0.1	%	50.0	54.1	51.2	77.0
4-Terphenyl-d14	1718-510	0.1	%	110	117	109	106
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate							
Decachlorobiphenyl	2051-24-3	0.1	%	66.5	57.6	63.8	67.9
EP-067_SR-S: Pesticide Surrogate							
Tetrachlorometaxylene	877-09-8	0.1	%	57.2	61.7	55.9	66.9
Dibutylchlorendate	1770-80-5	0.1	%	91.8	89.1	87.0	89.5



Laboratory Duplicate (DUP) Report

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849122)									
HK1506978-006	Anonymous		EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.04	0.04	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849124)									
HK1507060-005	SD8 ELUTRIATE BLK		EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.26	0.25	5.1
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3850117)									
HK1507489-001	Anonymous		EK057A: Nitrite as N	----	0.1	mg/L	<0.1	<0.1	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3853117)									
HK1506978-001	Anonymous		EK067P: Total Phosphorus as P	----	0.01	mg/L	0.03	0.03	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3850140)									
Anonymous									
EG020: Cadmium									
HK1506978-002			EG020: Mercury	7440-43-9	0.2	µg/L	<0.2	0.2	0.0
			EG020: Chromium	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
			EG020: Copper	7440-47-3	1	µg/L	<1	<1	0.0
			EG020: Lead	7440-50-8	1	µg/L	<1	<1	0.0
			EG020: Nickel	7439-92-1	1	µg/L	<1	<1	0.0
			EG020: Silver	7440-02-0	1	µg/L	1	1	0.0
			EG020: Arsenic	7440-22-4	1	µg/L	<1	<1	0.0
			EG020: Zinc	7440-38-2	10	µg/L	<10	<10	0.0
			EG020: Cadmium	7440-66-6	10	µg/L	<10	<10	0.0
			EG020: Mercury	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
			EG020: Chromium	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
			EG020: Copper	7440-47-3	1	µg/L	<1	<1	0.0
			EG020: Lead	7440-50-8	1	µg/L	5	5	0.0
			EG020: Nickel	7439-92-1	1	µg/L	<1	<1	0.0
			EG020: Silver	7440-02-0	1	µg/L	1	1	0.0
			EG020: Arsenic	7440-22-4	1	µg/L	<1	<1	0.0
			EG020: Zinc	7440-38-2	10	µg/L	<10	<10	0.0
EP-065A: PCB Single Congeners (QC Lot: 3845615)									
Anonymous									
HK1506978-006			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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
			PCB 138	35065-28-2	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 169	32774-16-6	0.01	µg/L	<0.01	<0.01	0.0



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Matrix: WATER		Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-065A: PCB Single Congeners (QC Lot: 3845615) - Continued							
HK1506978-006	Anonymous	PCB 170	0.01	µg/L	<0.01	<0.01	0.0
		PCB 180	0.01	µg/L	<0.01	<0.01	0.0
		PCB 187	0.01	µg/L	<0.01	<0.01	0.0
		Total Polychlorinated biphenyls	0.18	µg/L	<0.18	<0.18	0.0
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3845616)							
HK1506978-006	Anonymous	alpha-BHC	0.1	µg/L	<0.1	<0.1	0.0
		beta-BHC	0.1	µg/L	<0.1	<0.1	0.0
		gamma-BHC	0.1	µg/L	<0.1	<0.1	0.0
		delta-BHC	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor	0.1	µg/L	<0.1	<0.1	0.0
		Aldrin	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor epoxide	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan 1	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDE	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDD	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan sulfate	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDT	0.1	µg/L	<0.1	<0.1	0.0
EP-390: Triorganotins (QC Lot: 3851050)							
HK1507060-001	SD8 0M-0.9M	Tributyltin	6	ngSn/L	<6	<6	0.0
EP-390: Triorganotins (QC Lot: 3851051)							
HK1506963-003	Anonymous	Tributyltin	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								
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849122)												
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	94	104	94	104	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849124)												
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	96.5	92	108	92	108	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3850117)												
EK057A: Nitrite as N	-----	0.01	mg/L	<0.01	0.4 mg/L	107	98	112	98	112	-----	-----
				<0.01	0.05 mg/L	105	88	114	88	114	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3853117)												
EK067P: Total Phosphorus as P	-----	0.01	mg/L	<0.01	0.5 mg/L	100	91	103	91	103	-----	-----
EG: Metals and Major Cations - Filtered (QC Lot: 3850140)												
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	108	76	116	76	116	-----	-----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	104	81	109	81	109	-----	-----
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	100	80	112	80	112	-----	-----
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	98.2	79	115	79	115	-----	-----
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	90.6	82	108	82	108	-----	-----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	88.5	82	118	82	118	-----	-----



Matrix: WATER

Method: Compound		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report			
CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Limits (%)	Value	RPD (%)
							Low	High	
EG: Metals and Major Cations - Filtered (QC Lot: 3850140) - Continued									
EG020: Nickel	7440-02-0	1	µg/L	<1	111	---	79	115	---
EG020: Silver	7440-22-4	1	µg/L	<1	98.0	---	78	106	---
EG020: Zinc	7440-66-6	10	µg/L	<10	118	---	77	119	---
EP-065A: PCB Single Congeners (QC Lot: 3845615)									
PCB 8	34883-43-7	0.01	µg/L	<0.01	74.6	---	50	130	---
PCB 18	37680-65-2	0.01	µg/L	<0.01	80.8	---	50	130	---
PCB 28	7012-37-5	0.01	µg/L	<0.01	81.0	---	50	130	---
PCB 44	41464-39-5	0.01	µg/L	<0.01	92.0	---	50	130	---
PCB 52	35693-99-3	0.01	µg/L	<0.01	92.1	---	50	130	---
PCB 66	32598-10-0	0.01	µg/L	<0.01	84.8	---	50	130	---
PCB 77	32598-13-3	0.01	µg/L	<0.01	114	---	50	130	---
PCB 101	37680-73-2	0.01	µg/L	<0.01	119	---	50	130	---
PCB 105	32598-14-4	0.01	µg/L	<0.01	117	---	50	130	---
PCB 118	31508-00-6	0.01	µg/L	<0.01	119	---	50	130	---
PCB 126	57465-28-8	0.01	µg/L	<0.01	108	---	50	130	---
PCB 128	38380-07-3	0.01	µg/L	<0.01	118	---	50	130	---
PCB 138	35065-28-2	0.01	µg/L	<0.01	118	---	50	130	---
PCB 153	35065-27-1	0.01	µg/L	<0.01	119	---	50	130	---
PCB 169	32774-16-6	0.01	µg/L	<0.01	103	---	50	130	---
PCB 170	35065-30-6	0.01	µg/L	<0.01	110	---	50	130	---
PCB 180	35065-29-3	0.01	µg/L	<0.01	115	---	50	130	---
PCB 187	52663-68-0	0.01	µg/L	<0.01	122	---	50	130	---
Total Polychlorinated biphenyls									
		0.18	µg/L	<0.18	---	---	---	---	---
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3845550)									
Naphthalene	91-20-3	0.2	µg/L	<0.2	85.6	---	50	98	---
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	83.5	---	47	97	---
Acenaphthene	83-32-9	0.2	µg/L	<0.2	84.2	---	49	93	---
Fluorene	86-73-7	0.2	µg/L	<0.2	87.4	---	52	92	---
Phenanthrene	85-01-8	0.2	µg/L	<0.2	85.3	---	51	91	---
Anthracene	120-12-7	0.2	µg/L	<0.2	77.0	---	48	95	---
Fluoranthene	206-44-0	0.2	µg/L	<0.2	92.4	---	68	109	---
Pyrene	129-00-0	0.2	µg/L	<0.2	92.0	---	69	111	---
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	93.8	---	64	119	---
Chrysene	218-01-9	0.2	µg/L	<0.2	99.0	---	50	124	---
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	85.0	---	54	124	---
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	93.4	---	54	130	---
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	79.4	---	60	120	---
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	70.3	---	60	119	---
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	68.6	---	48	120	---
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	71.9	---	52	125	---
Low M.W. PAHs	-----	1.2	µg/L	<1.2	---	---	---	---	---
High M.W. PAHs	-----	2.0	µg/L	<2.0	---	---	---	---	---
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3845516)									



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 Work Order : HK1507060

Matrix: WATER		Method Blank (MB) Report					Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report							
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3845616) - Continued														
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	80.4	-----	-----	34	123	-----	-----	-----	-----
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	87.4	-----	-----	55	128	-----	-----	-----	-----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	83.8	-----	-----	45	118	-----	-----	-----	-----
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	88.0	-----	-----	59	114	-----	-----	-----	-----
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	82.8	-----	-----	42	104	-----	-----	-----	-----
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	81.4	-----	-----	45	117	-----	-----	-----	-----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	86.8	-----	-----	57	116	-----	-----	-----	-----
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	87.4	-----	-----	55	120	-----	-----	-----	-----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	88.6	-----	-----	63	122	-----	-----	-----	-----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	87.4	-----	-----	54	134	-----	-----	-----	-----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	93.8	-----	-----	67	123	-----	-----	-----	-----
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	98.2	-----	-----	43	121	-----	-----	-----	-----
EP-390: Triorganotins (QC Lot: 3851050)														
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	107	-----	-----	70	130	-----	-----	-----	-----
EP-390: Triorganotins (QC Lot: 3851051)														
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	96.8	-----	-----	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	MS	MSD	Low	High	Value	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849122)										
HK1506978-006	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	107	---	75	125	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849124)										
HK1507060-005	SD8 ELUTRIATE BLK	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	106	---	75	125	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3850117)										
HK1507489-001	Anonymous	EK057A: Nitrite as N	---	0.5 mg/L	108	---	75	125	---	---
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3853117)										
HK1506978-001	Anonymous	EK067P: Total Phosphorus as P	---	0.5 mg/L	96.0	---	75	125	---	---
EG: Metals and Major Cations - Filtered (QC Lot: 3850140)										
HK1506978-001	Anonymous	EG020: Arsenic	7440-38-2	10 µg/L	102	---	75	125	---	---
		EG020: Cadmium	7440-43-9	10 µg/L	110	---	75	125	---	---
		EG020: Chromium	7440-47-3	10 µg/L	123	---	75	125	---	---
		EG020: Copper	7440-50-8	10 µg/L	92.4	---	75	125	---	---
		EG020: Lead	7439-92-1	10 µg/L	105	---	75	125	---	---
		EG020: Mercury	7439-97-6	0.2 µg/L	112	---	75	125	---	---
		EG020: Nickel	7440-02-0	10 µg/L	98.4	---	75	125	---	---
		EG020: Silver	7440-22-4	10 µg/L	97.4	---	75	125	---	---
		EG020: Zinc	7440-66-6	10 µg/L	109	---	75	125	---	---
EP-390: Triorganotins (QC Lot: 3851050)										
HK1507060-002	SD8 0.9M-1.9M	Tributyltin	56573-85-4	2 ngSn/L	108	---	70	130	---	---
EP-390: Triorganotins (QC Lot: 3851051)										
HK1506963-003	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	106	---	70	130	---	---

Surrogate Control Limits

Sub-Matrix: ELUTRIATE		Recovery Limits (%)	
Compound	CAS Number	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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	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
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1507187
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		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 27-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 13-MAR-2015
C-O-C number	: H026598			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

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Hong Kong Accreditation Service (HKAS) has accredited 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
Chan Ka Yu, Karen	Manager - Organics	Organics
Wong Wing, Kenneth	Manager - Metals	Inorganics



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Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1507187

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: 10-MAR-2015

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: HK1507187

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient 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 D3974-09 based on ASTM D3974-09, prior to determination of metals.

Analysis of Tributyltin in interstitial water was cancelled due to insufficient volume of interstitial water except Sample #3 SD7 1.9M-2.9M and Sample #4 SD7 2.9M-3.9M.

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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Unit	Client sample ID				
				Client sampling date / time	SD7 0M-0.9M [27-FEB-2015] HK1507187-001	SD7 0.9M-1.9M [27-FEB-2015] HK1507187-002	SD7 1.9M-2.9M [27-FEB-2015] HK1507187-003	SD7 2.9M-3.9M [27-FEB-2015] HK1507187-004
EAI/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	19.2	19.5	19.3	18.8	
EG: Metals and Major Cations								
EG020: Arsenic	7440-38-2	1	mg/kg	<1	3	3	8	
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	
EG020: Chromium	7440-47-3	1	mg/kg	5	5	4	11	
EG020: Copper	7440-50-8	1	mg/kg	2	2	1	4	
EG020: Lead	7439-92-1	1	mg/kg	6	9	6	18	
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	
EG020: Nickel	7440-02-0	1	mg/kg	2	2	1	6	
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	
EG020: Zinc	7440-66-6	1	mg/kg	17	16	13	32	
EP-065: PCB Single Congeners								
PCB 8	34883-43-7	3	µg/kg	<3	<3	<3	<3	
PCB 18	37680-65-2	3	µg/kg	<3	<3	<3	<3	
PCB 28	7012-37-5	3	µg/kg	<3	<3	<3	<3	
PCB 44	41464-39-5	3	µg/kg	<3	<3	<3	<3	
PCB 52	35693-99-3	3	µg/kg	<3	<3	<3	<3	
PCB 66	32598-10-0	3	µg/kg	<3	<3	<3	<3	
PCB 77	32598-13-3	3	µg/kg	<3	<3	<3	<3	
PCB 101	37680-73-2	3	µg/kg	<3	<3	<3	<3	
PCB 105	32598-14-4	3	µg/kg	<3	<3	<3	<3	
PCB 118	31508-00-6	3	µg/kg	<3	<3	<3	<3	
PCB 126	57465-28-8	3	µg/kg	<3	<3	<3	<3	
PCB 128	38380-07-3	3	µg/kg	<3	<3	<3	<3	
PCB 138	35065-28-2	3	µg/kg	<3	<3	<3	<3	
PCB 153	35065-27-1	3	µg/kg	<3	<3	<3	<3	
PCB 169	32774-16-6	3	µg/kg	<3	<3	<3	<3	
PCB 170	35065-30-6	3	µg/kg	<3	<3	<3	<3	
PCB 180	35065-29-3	3	µg/kg	<3	<3	<3	<3	
PCB 187	52663-68-0	3	µg/kg	<3	<3	<3	<3	
Total Polychlorinated biphenyls	----	18	µg/kg	<18	<18	<18	<18	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)								
Naphthalene	9120-3	50	µg/kg	<50	<50	<50	<50	
Acenaphthylene	208-96-8	50	µg/kg	<50	<50	<50	<50	
Acenaphthene	83-32-9	50	µg/kg	<50	<50	<50	<50	
Fluorene	86-73-7	50	µg/kg	<50	<50	<50	<50	
Phenanthrene	85-01-8	50	µg/kg	<50	<50	<50	<50	



Compound	CAS Number	Client sample ID		SD7 0M-0.9M [27-FEB-2015] HK1507187-001	SD7 0.9M-1.9M [27-FEB-2015] HK1507187-002	SD7 1.9M-2.9M [27-FEB-2015] HK1507187-003	SD7 2.9M-3.9M [27-FEB-2015] HK1507187-004
		Client sampling date / time	Unit				
Sub-Matrix: SEDIMENT							
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued							
Anthracene	120-12-7	50	µg/kg	<50	<50	<50	<50
Fluoranthene	206-44-0	150	µg/kg	<150	<150	<150	<150
Pyrene	129-00-0	150	µg/kg	<150	<150	<150	<150
Benz(a)anthracene	56-55-3	150	µg/kg	<150	<150	<150	<150
Chrysene	218-01-9	150	µg/kg	<150	<150	<150	<150
Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	<150	<150
Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	<150	<150
Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	<150	<150
Indeno(1,2,3-cd)pyrene	193-39-5	150	µg/kg	<150	<150	<150	<150
Dibenz(a,h)anthracene	53-70-3	150	µg/kg	<150	<150	<150	<150
Benzo(g,h,i)perylene	191-24-2	150	µg/kg	<150	<150	<150	<150
Low M.W. PAHs	----	550	µg/kg	<550	<550	<550	<550
High M.W. PAHs	----	1700	µg/kg	<1700	<1700	<1700	<1700
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates							
2-Fluorobiphenyl	32160-8	0.1	%	93.8	84.1	89.2	95.8
4-Terphenyl-d14	1718-51-0	0.1	%	91.4	84.9	90.2	93.9
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate							
Decachlorobiphenyl	2051-24-3	0.1	%	50.2	129	53.5	52.9



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Sub-Matrix: INTERSTITIAL WATER		Client sample ID			
Compound	CAS Number	LOR	Unit		
EP-390: Triorganotins Tributyltin	56573-85-4	0.015	µg TBT/L	SD7 1.9M-2.9M [27-FEB-2015] HK1507187-003	SD7 2.9M-3.9M [27-FEB-2015] HK1507187-004
				<0.015	<0.015



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: 3845293)									
HK1507057-001	Anonymous		EA055: Moisture Content (dried @ 103°C)	----	0.1	%	51.6	51.6	0.0
HK1507255-001	Anonymous		EA055: Moisture Content (dried @ 103°C)	----	0.1	%	9.5	9.8	3.4
EG: Metals and Major Cations (QC Lot: 3847192)									
HK1506935-001	Anonymous		EG020: Silver	7440-22-4	0.1	mg/kg	0.2	0.2	0.0
			EG020: Cadmium	7440-43-9	0.2	mg/kg	0.4	0.4	0.0
			EG020: Mercury	7439-97-6	0.2	mg/kg	<0.2	<0.2	0.0
			EG020: Arsenic	7440-38-2	1	mg/kg	<1	<1	0.0
			EG020: Chromium	7440-47-3	1	mg/kg	5	5	0.0
			EG020: Copper	7440-50-8	1	mg/kg	159	162	2.1
			EG020: Lead	7439-92-1	1	mg/kg	16	14	11.1
			EG020: Nickel	7440-02-0	1	mg/kg	6	6	0.0
			EG020: Zinc	7440-66-6	1	mg/kg	158	164	3.6
HK1507057-002	Anonymous		EG020: Mercury	7439-97-6	0.05	mg/kg	0.09	0.09	0.0
			EG020: Silver	7440-22-4	0.1	mg/kg	0.7	0.6	0.0
			EG020: Cadmium	7440-43-9	0.2	mg/kg	0.2	0.2	0.0
			EG020: Arsenic	7440-38-2	1	mg/kg	14	16	11.0
			EG020: Chromium	7440-47-3	1	mg/kg	16	16	0.0
			EG020: Copper	7440-50-8	1	mg/kg	34	35	3.6
			EG020: Lead	7439-92-1	1	mg/kg	44	45	0.0
			EG020: Nickel	7440-02-0	1	mg/kg	9	9	0.0
			EG020: Zinc	7440-66-6	1	mg/kg	123	122	0.0
EG: Metals and Major Cations (QC Lot: 3847193)									
HK1507187-003	SD7 1.9M-2.9M		EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	<0.05	0.0
			EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	<0.1	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	3	3	0.0
			EG020: Chromium	7440-47-3	1	mg/kg	4	5	0.0
			EG020: Copper	7440-50-8	1	mg/kg	1	2	0.0
			EG020: Lead	7439-92-1	1	mg/kg	6	6	0.0
			EG020: Nickel	7440-02-0	1	mg/kg	1	2	0.0
			EG020: Zinc	7440-66-6	1	mg/kg	13	16	16.6
EP-065: PCB Single Congeners (QC Lot: 3841875)									
HK1507035-001	Anonymous		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



Matrix: SOIL		Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-065: PCB Single Congeners (QC Lot: 3841875) - Continued								
HK1507035-001	Anonymous	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3838396)								
HK1506555-001	Anonymous	High M.W. PAHs	----	1700	µg/kg	<1700	<1700	0.0
		Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0
		Benz(a)anthracene	56-55-3	500	µg/kg	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	500	µg/kg	<500	<500	0.0
		Dibenz(a,h)anthracene	53-70-3	500	µg/kg	<500	<500	0.0
		Benzo(g,h,i)perylene	191-24-2	500	µg/kg	<500	<500	0.0
		Low M.W. PAHs	----	550	µg/kg	<550	<550	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3843906)								
HK1507187-002	SD7 0.9M-1.9M	Fluoranthene	206-44-0	150	µg/kg	<150	<150	0.0
		Pyrene	129-00-0	150	µg/kg	<150	<150	0.0
		Benzo(a)anthracene	56-55-3	150	µg/kg	<150	<150	0.0
		Chrysene	218-01-9	150	µg/kg	<150	<150	0.0
		Benzo(b)fluoranthene	205-99-2	150	µg/kg	<150	<150	0.0
		Benzo(k)fluoranthene	207-08-9	150	µg/kg	<150	<150	0.0
		Benzo(a)pyrene	50-32-8	150	µg/kg	<150	<150	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	150	µg/kg	<150	<150	0.0
		Dibenz(a,h)anthracene	53-70-3	150	µg/kg	<150	<150	0.0
		Benzo(g,h,i)perylene	191-24-2	150	µg/kg	<150	<150	0.0
		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



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Matrix: SOIL		Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3843906) - Continued								
HK1507187-002	SD7 0.9M-1.9M	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	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-390: Triorganofins (QC Lot: 3851051)	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: 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	LCS	DCS	Recovery Limits (%)	Control Limit
						Low	High	Value	RPD (%)
EG: Metals and Major Cations (QC Lot: 3847192)									
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	76	112		
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	79	111		
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	76	118		
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	79	105		
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	80	104		
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	76	112		
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	79	105		
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	76	106		
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	76	114		
EG: Metals and Major Cations (QC Lot: 3847193)									
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	76	112		
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	79	111		
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	76	118		
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	79	105		
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	80	104		
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	76	112		
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	79	105		
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	76	106		
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	76	114		
EP-065: PCB Single Congeners (QC Lot: 3841875)									
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	41	126		
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	36	118		
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	35	119		
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	26	124		
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	26	124		
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	24	125		
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	51	122		
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	46	122		
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	52	122		
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	50	123		



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	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-065: PCB Single Congeners (QC Lot: 3841875) - Continued												
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	83.1	-----	-----	53	121	-----	-----
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	81.0	-----	-----	54	124	-----	-----
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	78.0	-----	-----	51	123	-----	-----
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	78.1	-----	-----	51	124	-----	-----
PCB 169	32774-16-6	3	µg/kg	<3	5 µg/kg	88.1	-----	-----	55	126	-----	-----
PCB 170	35065-30-6	3	µg/kg	<3	5 µg/kg	87.4	-----	-----	58	124	-----	-----
PCB 180	35065-29-3	3	µg/kg	<3	5 µg/kg	84.8	-----	-----	56	126	-----	-----
PCB 187	52663-68-0	3	µg/kg	<3	5 µg/kg	78.9	-----	-----	51	123	-----	-----
Total Polychlorinated biphenyls												
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3838396)												
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	89.5	-----	-----	68	107	-----	-----
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	99.0	-----	-----	70	113	-----	-----
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	92.3	-----	-----	68	108	-----	-----
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	98.6	-----	-----	71	111	-----	-----
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	91.6	-----	-----	71	110	-----	-----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	93.6	-----	-----	63	117	-----	-----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	96.8	-----	-----	72	113	-----	-----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	96.7	-----	-----	72	112	-----	-----
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	94.9	-----	-----	70	119	-----	-----
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	82.0	-----	-----	79	112	-----	-----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	100	-----	-----	68	125	-----	-----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	93.4	-----	-----	75	113	-----	-----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	95.8	-----	-----	64	118	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	101	-----	-----	61	127	-----	-----
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	85.4	-----	-----	66	112	-----	-----
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	102	-----	-----	73	114	-----	-----
Low M.W. PAHs												
High M.W. PAHs												
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3843906)												
Naphthalene	91-20-3	25	µg/kg	<50	500 µg/kg	89.2	-----	-----	68	107	-----	-----
Acenaphthylene	208-96-8	25	µg/kg	<50	500 µg/kg	89.5	-----	-----	70	113	-----	-----
Acenaphthene	83-32-9	25	µg/kg	<50	500 µg/kg	89.4	-----	-----	68	108	-----	-----
Fluorene	86-73-7	25	µg/kg	<50	500 µg/kg	93.6	-----	-----	71	111	-----	-----
Phenanthrene	85-01-8	25	µg/kg	<50	500 µg/kg	91.6	-----	-----	71	110	-----	-----
Anthracene	120-12-7	25	µg/kg	<50	500 µg/kg	87.1	-----	-----	63	117	-----	-----
Fluoranthene	206-44-0	25	µg/kg	<50	500 µg/kg	95.4	-----	-----	72	113	-----	-----
Pyrene	129-00-0	25	µg/kg	<50	500 µg/kg	94.4	-----	-----	72	112	-----	-----
Benz(a)anthracene	56-55-3	25	µg/kg	<50	500 µg/kg	92.2	-----	-----	70	119	-----	-----
Chrysene	218-01-9	25	µg/kg	<50	500 µg/kg	93.5	-----	-----	79	112	-----	-----
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	500 µg/kg	82.9	-----	-----	68	125	-----	-----
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	500 µg/kg	90.4	-----	-----	75	113	-----	-----
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	500 µg/kg	79.6	-----	-----	64	118	-----	-----
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	500 µg/kg	74.4	-----	-----	61	127	-----	-----



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	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3843906) - Continued														
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	500 µg/kg	72.2	66	112	66	112	112	.....	.....	.....
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	500 µg/kg	77.0	73	114	73	114	114	.....	.....	.....
Low M.W. PAHs	.....	550	µg/kg	<550	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
High M.W. PAHs	.....	1700	µg/kg	<1700	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Matrix: WATER														
Method Blank (MB) Report														
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Low	High	Value	RPD (%)	Control Limit
EP-390: Triorganotins (QC Lot: 3851051)	56573-85-4	5	ngSn/L	<5	2 ngSn/L	96.8	70	130	70	130	130
Tributyltin														



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 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1507187

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

Matrix: SOIL

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report			RPD (%)	
					MS	MSD	Recovery Limits (%)		
EG: Metals and Major Cations (QC Lot: 3847192)									
HK1506934-001	Anonymous	EG020: Arsenic	7440-38-2	5 mg/kg	90.0	---	75	125	---
		EG020: Cadmium	7440-43-9	5 mg/kg	92.9	---	75	125	---
		EG020: Chromium	7440-47-3	5 mg/kg	84.6	---	75	125	---
		EG020: Copper	7440-50-8	5 mg/kg	79.7	---	75	125	---
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined	---	75	125	---
		EG020: Mercury	7439-97-6	1 mg/kg	84.5	---	75	125	---
		EG020: Nickel	7440-02-0	5 mg/kg	80.4	---	75	125	---
		EG020: Silver	7440-22-4	5 mg/kg	88.3	---	75	125	---
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined	---	75	125	---
EG: Metals and Major Cations (QC Lot: 3847193)									
HK1507187-002	SD7 0.9M-1.9M	EG020: Arsenic	7440-38-2	5 mg/kg	90.1	---	75	125	---
		EG020: Cadmium	7440-43-9	5 mg/kg	94.1	---	75	125	---
		EG020: Chromium	7440-47-3	5 mg/kg	92.9	---	75	125	---
		EG020: Copper	7440-50-8	5 mg/kg	85.0	---	75	125	---
		EG020: Lead	7439-92-1	50 mg/kg	99.4	---	75	125	---
		EG020: Mercury	7439-97-6	0.1 mg/kg	93.8	---	75	125	---
		EG020: Nickel	7440-02-0	5 mg/kg	86.7	---	75	125	---
		EG020: Silver	7440-22-4	5 mg/kg	79.0	---	75	125	---
		EG020: Zinc	7440-66-6	50 mg/kg	96.6	---	75	125	---
Matrix: WATER									
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Spike Concentration	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report			RPD (%)	
					MS	MSD	Recovery Limits (%)		
HK1506963-003	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	106	---	70	130	---

Surrogate Control Limits

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 5
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1507201
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Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 27-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 16-MAR-2015
C-O-C number	: H026598			No. of samples received	: 4
Site	: ----			No. of samples analysed	: 4

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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

Chan Ka Yu, Karen
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Position

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Page Number : 2 of 5
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1507201

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:

10-MAR-2015

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: **HK1507201**

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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

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



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		SD7 0M-0.9M [27-FEB-2015] HK1507201-001	SD7 0.9M-1.9M [27-FEB-2015] HK1507201-002	SD7 1.9M-2.9M [27-FEB-2015] HK1507201-003	SD7 2.9M-3.9M [27-FEB-2015] HK1507201-004
			Client sampling date / time	Unit				
EA/ED: Physical and Aggregate Properties								
EA055: Moisture Content (dried @ 103° C)	----	0.1	%		19.2	19.5	19.3	18.8
ED/EE: Inorganic Nonmetallic Parameters								
EK055: Ammonia as N	7664-41-7	0.1	mg/kg		<1.0	1.4	2.0	2.1
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg		120	230	216	170
EK067A: Total Phosphorus as P	----	1	mg/kg		127	179	177	129
EP-067_SR-A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
beta-BHC	319-85-7	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
gamma-BHC	58-89-9	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
delta-BHC	319-86-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Heptachlor	76-44-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Aldrin	309-00-2	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Heptachlor epoxide	1024-57-3	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Endosulfan 1	959-98-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
4,4'-DDE	72-55-9	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
4,4'-DDD	72-54-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
Endosulfan sulfate	1031-07-8	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
4,4'-DDT	50-29-3	0.50	mg/kg		<0.50	<0.50	<0.50	<0.50
EP-067_SR-S: Pesticide Surrogate								
Tetrachlorometaxylene	877-09-8	0.1	%		70.6	78.0	73.8	77.4
Dibutylchlorendate	1770-80-5	0.1	%		71.2	76.0	73.0	76.4
					Surrogate control limits listed at end of this report.			



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report			RPD (%)
						Original Result	Duplicate Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3845270)									
HK1507058-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	51.6	51.6	51.6	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849042)									
HK1506971-001	Anonymous	EK055: Ammonia as N	7664-41-7	0.1	mg/kg	<1.0	<1.0	<1.0	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849671)									
HK1506971-005	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg	608	551	551	9.9
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849672)									
HK1506971-005	Anonymous	EK067A: Total Phosphorus as P	----	1	mg/kg	184	168	168	9.2
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3843907)									
HK1507058-001	Anonymous	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		4,4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		4,4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		4,4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	<0.50	0.0

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

Method: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report			Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report			RPD (%)
					Spike Concentration	Spike Recovery (%)	DCS	LCS	Recovery Limits (%)	Value		Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3845284)											
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	2 mg/kg	106	85	115	85	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849042)											
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1	5 mg/kg	100	89	113	89	113	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849671)											
EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	1000 mg/kg	97.5	85	115	85	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849672)											
EK067A: Total Phosphorus as P	----	20	mg/kg	<20	695 mg/kg	92.4	85	115	85	115	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3843907)											
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.25 mg/kg	89.0	55	106	55	106	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.25 mg/kg	89.0	37	123	37	123	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.25 mg/kg	89.0	43	112	43	112	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.25 mg/kg	90.6	64	113	64	113	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.25 mg/kg	90.0	42	113	42	113	-----
Aldrin	309-00-2	0.05	mg/kg	<0.05	0.25 mg/kg	88.2	57	106	57	106	-----



Method: Compound	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
	CAS Number	LOR	Unit	Result	Spike Concentration		Spike Recovery (%)		Recovery Limits (%)		RPD (%)
					LCS	DCS	Low	High	Value	Control Limit	
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3843907) - Continued											
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	90.8	-----	61	108	-----	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	90.4	-----	55	120	-----	-----	-----
4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	91.2	-----	60	116	-----	-----	-----
4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	92.6	-----	52	127	-----	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	93.2	-----	56	120	-----	-----	-----
4.4'-DDT	50-29-3	0.05	mg/kg	<0.05	91.4	-----	45	126	-----	-----	-----

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

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

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchloroendate	1770-80-5	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 10
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1507221
Address	: GEOTECHNICAL PROJECTS DIVISION, GEOTECHNICAL ENGINEERING OFFICE, 23/F., KWUN TONG VIEW, 410 KWUN TONG ROAD, KOWLOON, HONG KONG	Address	: 1/F., Chung Shun Knitting Centre, 1 - 3 Wing Yip Street, Kwai Chung, N.T., Hong Kong		
E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 27-FEB-2015
Order number	: GE/2014/21.01			Issue Date	: 13-MAR-2015
C-O-C number	: H026597			No. of samples received	: 5
Site	: ----			No. of samples analysed	: 5

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Manager - Organics
General Manager

Authorised results for

Organics
Inorganics

Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1507221



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: 11-MAR-2015

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: **HK1507221**

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

Sample(s) were received in an ambient condition.

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

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

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



Sub-Matrix: ELUTRIATE	Client sample ID		SD7 0M-0.9M [27-FEB-2015] HK1507221-001	SD7 0.9M-1.9M [27-FEB-2015] HK1507221-002	SD7 1.9M-2.9M [27-FEB-2015] HK1507221-003	SD7 2.9M-3.9M [27-FEB-2015] HK1507221-004	SD7 ELUTRIATE BLK [27-FEB-2015] HK1507221-005
	CAS Number	Unit					
ED/EK: Inorganic Nonmetallic Parameters							
EK055K: Ammonia as N	7664-41-7	mg/L	0.39	0.41	0.46	0.45	0.19
EK057A: Nitrite as N	---	mg/L	0.01	0.02	0.01	0.01	0.01
EK058A: Nitrate as N	14797-55-8	mg/L	0.36	0.36	0.37	0.37	0.37
EK061P: Total Kjeldahl Nitrogen as N	---	mg/L	0.7	0.8	0.9	0.9	0.6
EK067P: Total Phosphorus as P	---	mg/L	0.06	0.07	0.07	0.06	0.06
EK071K: Reactive Phosphorus as P	14265-44-2	µg/L	60	50	60	60	50
EG: Metals and Major Cations - Filtered							
EG020: Arsenic	7440-38-2	µg/L	<10	<10	<10	<10	<10
EG020: Cadmium	7440-43-9	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
EG020: Chromium	7440-47-3	µg/L	<1	<1	<1	<1	<1
EG020: Copper	7440-50-8	µg/L	4	5	4	<1	2
EG020: Lead	7439-92-1	µg/L	<1	<1	1	<1	<1
EG020: Mercury	7439-97-6	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
EG020: Nickel	7440-02-0	µg/L	1	2	1	2	1
EG020: Silver	7440-22-4	µg/L	<1	<1	<1	<1	<1
EG020: Zinc	7440-66-6	µg/L	<10	<10	<10	<10	<10
EP-065A: PCB Single Congeners							
PCB 8	34883-43-7	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 18	37680-65-2	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 28	7012-37-5	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 44	41464-39-5	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 52	35693-99-3	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 66	32598-10-0	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 77	32598-13-3	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 101	37680-73-2	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 105	32598-14-4	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 118	31508-00-6	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 126	57465-28-8	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 128	38380-07-3	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 138	35065-28-2	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 153	35065-27-1	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 169	32774-16-6	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 170	35065-30-6	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 180	35065-29-3	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
PCB 187	52663-68-0	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Total Polychlorinated biphenyls	---	µg/L	<0.18	<0.18	<0.18	<0.18	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)							
Naphthalene	91-20-3	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	208-96-8	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2



Compound	CAS Number		Client sampling date / time		Client sample ID				
	LOR	Unit	SD7 0M-0.9M [27-FEB-2015] HK1507221-001	SD7 0.9M-1.9M [27-FEB-2015] HK1507221-002	SD7 1.9M-2.9M [27-FEB-2015] HK1507221-003	SD7 2.9M-3.9M [27-FEB-2015] HK1507221-004	SD7 ELUTRIATE BLK [27-FEB-2015] HK1507221-005		
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued									
Acenaphthene	83-32-9	0.2	µg/L	<0.2	<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	<0.2
Phenanthrene	85-01-8	0.2	µg/L	<0.2	<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	<0.2
Fluoranthene	206-44-0	0.2	µg/L	<0.2	<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	<0.2
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	<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	<0.2
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	<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	<0.2
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	<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	<0.2
Low M.W. PAHs	----	2.2	µg/L	<2.2	<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	<6.8
EP-067_SR-A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates									
2-Fluorobiphenyl	32160-8	0.1	%	80.9	82.2	70.8	79.8	73.6	109
4-Terphenyl-d14	1718-510	0.1	%	112	112	116	110	109	70.1
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate									
Decachlorobiphenyl	205124-3	0.1	%	69.3	65.6	56.4	58.3	70.1	61.5
EP-067_SR-S: Pesticide Surrogate									
Tetrachlorometaxylene	877-09-8	0.1	%	76.5	72.9	55.1	67.4	61.5	90.4
Dibutylchlorendate	1770-80-5	0.1	%	100	91.1	82.2	86.4	90.4	



Laboratory Duplicate (DUP) Report

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
Matrix: WATER									
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849122)									
HK1506978-006	Anonymous		EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.04	0.04	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849124)									
HK1507060-005	Anonymous		EK055K: Ammonia as N	7664-41-7	0.01	mg/L	0.26	0.25	5.1
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3850117)									
HK1507489-001	Anonymous		EK057A: Nitrite as N	----	0.1	mg/L	<0.1	<0.1	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3853117)									
HK1506978-001	Anonymous		EK067P: Total Phosphorus as P	----	0.01	mg/L	0.03	0.03	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3850140)									
Anonymous									
EG020: Cadmium									
HK1506978-002			EG020: Mercury	7440-43-9	0.2	µg/L	<0.2	0.2	0.0
EG020: Chromium									
			EG020: Chromium	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
EG020: Copper									
			EG020: Copper	7440-47-3	1	µg/L	<1	<1	0.0
EG020: Lead									
			EG020: Lead	7440-50-8	1	µg/L	<1	<1	0.0
EG020: Nickel									
			EG020: Nickel	7439-92-1	1	µg/L	<1	<1	0.0
EG020: Silver									
			EG020: Silver	7440-02-0	1	µg/L	1	1	0.0
EG020: Arsenic									
			EG020: Arsenic	7440-22-4	1	µg/L	<1	<1	0.0
EG020: Zinc									
			EG020: Zinc	7440-38-2	10	µg/L	<10	<10	0.0
EG020: Cadmium									
			EG020: Cadmium	7440-66-6	10	µg/L	<10	<10	0.0
EG020: Mercury									
			EG020: Mercury	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
EG020: Chromium									
			EG020: Chromium	7439-97-6	0.5	µg/L	<0.5	<0.5	0.0
EG020: Copper									
			EG020: Copper	7440-47-3	1	µg/L	<1	<1	0.0
EG020: Lead									
			EG020: Lead	7440-50-8	1	µg/L	5	5	0.0
EG020: Nickel									
			EG020: Nickel	7439-92-1	1	µg/L	<1	<1	0.0
EG020: Silver									
			EG020: Silver	7440-02-0	1	µg/L	1	1	0.0
EG020: Arsenic									
			EG020: Arsenic	7440-22-4	1	µg/L	<1	<1	0.0
EG020: Zinc									
			EG020: Zinc	7440-38-2	10	µg/L	<10	<10	0.0
EP-065A: PCB Single Congeners (QC Lot: 3845615)									
Anonymous									
HK1506978-006			PCB 8	34883-43-7	0.01	µg/L	<0.01	<0.01	0.0
PCB 18									
			PCB 18	37680-65-2	0.01	µg/L	<0.01	<0.01	0.0
PCB 28									
			PCB 28	7012-37-5	0.01	µg/L	<0.01	<0.01	0.0
PCB 44									
			PCB 44	41464-39-5	0.01	µg/L	<0.01	<0.01	0.0
PCB 52									
			PCB 52	35693-99-3	0.01	µg/L	<0.01	<0.01	0.0
PCB 66									
			PCB 66	32598-10-0	0.01	µg/L	<0.01	<0.01	0.0
PCB 77									
			PCB 77	32598-13-3	0.01	µg/L	<0.01	<0.01	0.0
PCB 101									
			PCB 101	37680-73-2	0.01	µg/L	<0.01	<0.01	0.0
PCB 105									
			PCB 105	32598-14-4	0.01	µg/L	<0.01	<0.01	0.0
PCB 118									
			PCB 118	31508-00-6	0.01	µg/L	<0.01	<0.01	0.0
PCB 126									
			PCB 126	57465-28-8	0.01	µg/L	<0.01	<0.01	0.0
PCB 128									
			PCB 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
PCB 138									
			PCB 138	35065-28-2	0.01	µg/L	<0.01	<0.01	0.0
PCB 153									
			PCB 153	35065-27-1	0.01	µg/L	<0.01	<0.01	0.0
PCB 169									
			PCB 169	32774-16-6	0.01	µg/L	<0.01	<0.01	0.0



Matrix: WATER

Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report								
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849122)												
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	100	-----	-----	94	104	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849124)												
EK055K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	96.5	-----	-----	92	108	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3850117)												
EK057A: Nitrite as N	-----	0.01	mg/L	<0.01	0.4 mg/L 0.05 mg/L	107 105	-----	-----	98 88	112 114	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3853117)												
EK067P: Total Phosphorus as P	-----	0.01	mg/L	<0.01	0.5 mg/L	100	-----	-----	91	103	-----	-----
EG: Metals and Major Cations - Filtered (QC Lot: 3850140)												
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	108	-----	-----	76	116	-----	-----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	104	-----	-----	81	109	-----	-----
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	100	-----	-----	80	112	-----	-----
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	98.2	-----	-----	79	115	-----	-----
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	90.6	-----	-----	82	108	-----	-----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	0.2 µg/L	88.5	-----	-----	82	118	-----	-----
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	111	-----	-----	79	115	-----	-----
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	98.0	-----	-----	78	106	-----	-----
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	118	-----	-----	77	119	-----	-----
EP-065A: PCB Single Congeners (QC Lot: 3845615)												
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	74.6	-----	-----	50	130	-----	-----
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	80.8	-----	-----	50	130	-----	-----
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	81.0	-----	-----	50	130	-----	-----
PCB 44	41464-39-5	0.01	µg/L	<0.01	0.1 µg/L	92.0	-----	-----	50	130	-----	-----
PCB 52	35693-99-3	0.01	µg/L	<0.01	0.1 µg/L	92.1	-----	-----	50	130	-----	-----
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	84.8	-----	-----	50	130	-----	-----
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	114	-----	-----	50	130	-----	-----
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	119	-----	-----	50	130	-----	-----
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	117	-----	-----	50	130	-----	-----
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	119	-----	-----	50	130	-----	-----
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	108	-----	-----	50	130	-----	-----
PCB 128	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	118	-----	-----	50	130	-----	-----
PCB 138	35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	118	-----	-----	50	130	-----	-----
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	119	-----	-----	50	130	-----	-----
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	103	-----	-----	50	130	-----	-----
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	110	-----	-----	50	130	-----	-----
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	115	-----	-----	50	130	-----	-----
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	122	-----	-----	50	130	-----	-----
Total Polychlorinated biphenyls	-----	0.18	µg/L	<0.18	-----	-----	-----	-----	-----	-----	-----	-----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3845617)												
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	97.5	-----	-----	50	98	-----	-----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	91.3	-----	-----	47	97	-----	-----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	91.3	-----	-----	49	93	-----	-----



Matrix: WATER		Method Blank (MB) Report					Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Low	Recovery High	Value	RPD (%)	Control Limit
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3845617) - Continued												
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	86.9	-----	52	92	-----	-----	-----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	89.6	-----	51	91	-----	-----	-----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	90.3	-----	48	95	-----	-----	-----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	106	-----	68	109	-----	-----	-----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	105	-----	69	111	-----	-----	-----
Benz(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	101	-----	64	119	-----	-----	-----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	102	-----	50	124	-----	-----	-----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	95.8	-----	54	124	-----	-----	-----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	99.6	-----	54	130	-----	-----	-----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	96.1	-----	60	120	-----	-----	-----
Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	93.0	-----	60	119	-----	-----	-----
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	97.4	-----	48	120	-----	-----	-----
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	96.3	-----	52	125	-----	-----	-----
Low M.W. PAHs	-----	1.2	µg/L	<1.2	-----	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	2.0	µg/L	<2.0	-----	-----	-----	-----	-----	-----	-----	-----
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3845616)												
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	80.4	-----	34	123	-----	-----	-----
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	87.4	-----	55	128	-----	-----	-----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	83.8	-----	45	118	-----	-----	-----
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	88.0	-----	59	114	-----	-----	-----
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	82.8	-----	42	104	-----	-----	-----
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	81.4	-----	45	117	-----	-----	-----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	86.8	-----	57	116	-----	-----	-----
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	87.4	-----	55	120	-----	-----	-----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	88.6	-----	63	122	-----	-----	-----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	87.4	-----	54	134	-----	-----	-----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	93.8	-----	67	123	-----	-----	-----
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	98.2	-----	43	121	-----	-----	-----
EP-390: Triorganotin (QC Lot: 3851051)												
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	96.8	-----	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	MS	MSD	Recovery Limits (%)	RPD (%)	
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849122)									
HK1506978-006	Anonymous	EK071K: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	107	-----	75	125	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3849124)									
HK1507060-005	Anonymous	EK055K: Ammonia as N	7664-41-7	0.5 mg/L	106	-----	75	125	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3850117)									
HK1507489-001	Anonymous	EK057A: Nitrite as N	-----	0.5 mg/L	108	-----	75	125	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3853117)									
HK1506978-001	Anonymous	EK067P: Total Phosphorus as P	-----	0.5 mg/L	96.0	-----	75	125	-----
EG: Metals and Major Cations - Filtered (QC Lot: 3850140)									
HK1506978-001	Anonymous	EG020: Arsenic	7440-38-2	10 µg/L	102	-----	75	125	-----
		EG020: Cadmium	7440-43-9	10 µg/L	110	-----	75	125	-----
		EG020: Chromium	7440-47-3	10 µg/L	123	-----	75	125	-----
		EG020: Copper	7440-50-8	10 µg/L	92.4	-----	75	125	-----
		EG020: Lead	7439-92-1	10 µg/L	105	-----	75	125	-----
		EG020: Mercury	7439-97-6	0.2 µg/L	112	-----	75	125	-----
		EG020: Nickel	7440-02-0	10 µg/L	98.4	-----	75	125	-----
		EG020: Silver	7440-22-4	10 µg/L	97.4	-----	75	125	-----
		EG020: Zinc	7440-66-6	10 µg/L	109	-----	75	125	-----
EP-390: Triorganotins (QC Lot: 3851051)									
HK1506963-003	Anonymous	Tributyltin	56573-85-4	2 ngSn/L	106	-----	70	130	-----

Surrogate Control Limits

Sub-Matrix: ELUTRIATE		Recovery Limits (%)	
Compound	CAS Number	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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

ALS Technichem (HK) Pty Ltd

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

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Project : AGREEMENT NO CE63_2012 (DS)
EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1
Order number : GE/2014/21.01
C-O-C number : H026554
Site : ----

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Page : 1 of 9
Work Order : HK1509806

Date Samples Received : 20-MAR-2015
Issue Date : 02-APR-2015
No. of samples received : 1
No. of samples analysed : 1

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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

Chan Ka Yu, Karen
Lin Wai Yu, Iris
Wong Wing, Kenneth

Position

Manager - Organics
Senior Chemist - Inorganics
Manager - Metals

Authorised results for

Organics
Inorganics
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: 30-MAR-2015

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: **HK1509806**

Low and High M.W. PAHs results (Method: EP076HK) are not HOKLAS accredited. Low M.W. PAHs is sum of Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene; High M.W. PAHs is sum of Fluoranthene, Pyrene, Benz(a)anthracene, Chrysene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1.2.3.cd)pyrene, Dibenzo(a,h)anthracene, Benzo(g,h,i)perylene.

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.
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 D3974-09 based on ASTM D3974-09, prior to 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 µg/kg.



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	Client sampling date / time		Client sample ID
		LOR	Unit	
EA/ED: Physical and Aggregate Properties				
EA055: Moisture Content (dried @ 103°C)	----	0.1	%	48.2
EG: Metals and Major Cations				
EG020: Arsenic	7440-38-2	1	mg/kg	7
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2
EG020: Chromium	7440-47-3	1	mg/kg	31
EG020: Copper	7440-50-8	1	mg/kg	16
EG020: Lead	7439-92-1	1	mg/kg	40
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05
EG020: Nickel	7440-02-0	1	mg/kg	22
EG020: Silver	7440-22-4	0.1	mg/kg	0.1
EG020: Zinc	7440-66-6	1	mg/kg	82
EP-065: PCB Single Congeners				
PCB 8	34863-43-7	3	µg/kg	<3
PCB 18	37680-65-2	3	µg/kg	<3
PCB 28	7012-37-5	3	µg/kg	<3
PCB 44	41464-39-5	3	µg/kg	<3
PCB 52	35693-99-3	3	µg/kg	<3
PCB 66	32598-10-0	3	µg/kg	<3
PCB 77	32598-13-3	3	µg/kg	<3
PCB 101	37680-73-2	3	µg/kg	<3
PCB 105	32598-14-4	3	µg/kg	<3
PCB 118	31508-00-6	3	µg/kg	<3
PCB 126	57465-28-8	3	µg/kg	<3
PCB 128	38380-07-3	3	µg/kg	<3
PCB 138	35065-28-2	3	µg/kg	<3
PCB 153	35065-27-1	3	µg/kg	<3
PCB 169	32774-16-6	3	µg/kg	<3
PCB 170	35065-30-6	3	µg/kg	<3
PCB 180	35065-29-3	3	µg/kg	<3
PCB 187	52663-68-0	3	µg/kg	<3
Total Polychlorinated biphenyls	----	18	µg/kg	<18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)				
Naphthalene	91-20-3	50	µg/kg	<50
Acenaphthylene	208-96-8	50	µg/kg	<50
Acenaphthene	83-32-9	50	µg/kg	<50
Fluorene	86-73-7	50	µg/kg	<50
Phenanthrene	85-01-8	50	µg/kg	<50
Anthracene	120-12-7	50	µg/kg	<50



Sub-Matrix: SEDIMENT

Compound	Client sample ID		RGS1
	Client sampling date / time		
CAS Number	LOR	Unit	[20-MAR-2015] HK1509806-001
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued			
Fluoranthene	206-44-0	150 µg/kg	<150
Pyrene	129-00-0	150 µg/kg	<150
Benzo(a)anthracene	56-55-3	150 µg/kg	<150
Chrysene	218-019	150 µg/kg	<150
Benzo(b)fluoranthene	205-99-2	150 µg/kg	<150
Benzo(k)fluoranthene	207-08-9	150 µg/kg	<150
Benzo(a)pyrene	50-32-8	150 µg/kg	<150
Indeno(1,2,3-cd)pyrene	193-39-5	150 µg/kg	<150
Dibenz(a,h)anthracene	53-70-3	150 µg/kg	<150
Benzo(g,h,i)perylene	191-24-2	150 µg/kg	<150
Low M.W. PAHs	---	550 µg/kg	<550
High M.W. PAHs	---	1700 µg/kg	<1700
EP-076S: Polycyclic Aromatic Hydrocarbons (PAHs) Surrogates			
2-Fluorobiphenyl	32160-8	0.1 %	106
4-Terphenyl-d14	1718-51-0	0.1 %	105
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate			
Decachlorobiphenyl	205124-3	0.1 %	65.5
			Surrogate control limits listed at end of this report.
			Surrogate control limits listed at end of this report.



Sub-Matrix: INTERSTITIAL WATER

Compound	CAS Number	Client sampling date / time		Client sample ID
		LOR	Unit	
EP-390: Triorganotins				RGS1
Tributyltin	56573-85-4	0.015	µg TBT/L	[20-MAR-2015] HK1509806-001
				<0.015



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 (%)
E/ED: Physical and Aggregate Properties (QC Lot: 3869726)								
HK1509438-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	19.6	20.7	5.6
HK1509573-001	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	14.4	13.7	5.4
EG: Metals and Major Cations (QC Lot: 3878754)								
HK1510004-001	Anonymous	EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	0.1	0.0
		EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Mercury	7439-97-6	0.2	mg/kg	<0.2	<0.2	0.0
		EG020: Arsenic	7440-38-2	1	mg/kg	4	4	0.0
		EG020: Chromium	7440-47-3	1	mg/kg	8	9	0.0
		EG020: Copper	7440-50-8	1	mg/kg	8	7	15.6
		EG020: Lead	7439-92-1	1	mg/kg	69	76	9.0
		EG020: Nickel	7440-02-0	1	mg/kg	3	3	0.0
		EG020: Zinc	7440-66-6	1	mg/kg	84	77	9.7
EP-065: PCB Single Congeners (QC Lot: 3869064)								
HK1509644-001	Anonymous	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-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3864600)								
HK1508976-001	Anonymous	High M.W. PAHs	----	1700	µg/kg	<1700	<1700	0.0
		Naphthalene	91-20-3	500	µg/kg	<500	<500	0.0
		Acenaphthylene	208-96-8	500	µg/kg	<500	<500	0.0
		Acenaphthene	83-32-9	500	µg/kg	<500	<500	0.0
		Fluorene	86-73-7	500	µg/kg	<500	<500	0.0
		Phenanthrene	85-01-8	500	µg/kg	<500	<500	0.0
		Anthracene	120-12-7	500	µg/kg	<500	<500	0.0
		Fluoranthene	206-44-0	500	µg/kg	<500	<500	0.0
		Pyrene	129-00-0	500	µg/kg	<500	<500	0.0



Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report			RPD (%)			
				LOR	Unit	Duplicate Result		Original Result	Duplicate Result	
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3864600) - Continued										
HK1508976-001	Anonymous	Benzo(a)anthracene	56-55-3	500	µg/kg	<500	<500	<500	<500	0.0
		Chrysene	218-01-9	500	µg/kg	<500	<500	<500	<500	0.0
		Benzo(b)fluoranthene	205-99-2	500	µg/kg	<500	<500	<500	<500	0.0
		Benzo(k)fluoranthene	207-08-9	500	µg/kg	<500	<500	<500	<500	0.0
		Benzo(a)pyrene	50-32-8	500	µg/kg	<500	<500	<500	<500	0.0
		Indeno(1,2,3-cd)pyrene	193-39-5	500	µg/kg	<500	<500	<500	<500	0.0
		Dibenz(a,h)anthracene	53-70-3	500	µg/kg	<500	<500	<500	<500	0.0
		Benzo(g,h,i)perylene	191-24-2	500	µg/kg	<500	<500	<500	<500	0.0
		Low M.W. PAHs	----	550	µg/kg	<550	<550	<550	<550	0.0

Matrix: WATER										
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)		
EP-390: Triorganofins (QC Lot: 3877654)										
HK1509628-001	Anonymous	Tributyltin	56573-85-4	6	ngSn/L	<6	<6	<6	0.0	

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

Method: Compound	CAS Number	LOR	Unit	Result	Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report						
					Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	Control Limit
Matrix: SOIL											
Method Blank (MB) Report											
EG020: Arsenic	7440-38-2	1	mg/kg	<1	5 mg/kg	87.7	76	112	76	112	-----
EG020: Cadmium	7440-43-9	0.2	mg/kg	<0.2	5 mg/kg	99.8	79	111	79	111	-----
EG020: Chromium	7440-47-3	1	mg/kg	<1	5 mg/kg	105	76	118	76	118	-----
EG020: Copper	7440-50-8	1	mg/kg	<1	5 mg/kg	88.2	79	105	79	105	-----
EG020: Lead	7439-92-1	1	mg/kg	<1	5 mg/kg	101	80	104	80	104	-----
EG020: Mercury	7439-97-6	0.05	mg/kg	<0.05	0.1 mg/kg	88.8	76	112	76	112	-----
EG020: Nickel	7440-02-0	1	mg/kg	<1	5 mg/kg	87.9	79	105	79	105	-----
EG020: Silver	7440-22-4	0.1	mg/kg	<0.1	5 mg/kg	96.2	76	106	76	106	-----
EG020: Zinc	7440-66-6	1	mg/kg	<1	5 mg/kg	101	76	114	76	114	-----
EP-065: PCB Single Congeners (QC Lot: 3869064)											
PCB 8	34883-43-7	3	µg/kg	<3	5 µg/kg	75.9	41	126	41	126	-----
PCB 18	37680-65-2	3	µg/kg	<3	5 µg/kg	73.6	36	118	36	118	-----
PCB 28	7012-37-5	3	µg/kg	<3	5 µg/kg	81.1	35	119	35	119	-----
PCB 44	41464-39-5	3	µg/kg	<3	5 µg/kg	82.8	26	124	26	124	-----
PCB 52	35693-99-3	3	µg/kg	<3	5 µg/kg	82.3	26	124	26	124	-----
PCB 66	32598-10-0	3	µg/kg	<3	5 µg/kg	88.8	24	125	24	125	-----
PCB 77	32598-13-3	3	µg/kg	<3	5 µg/kg	83.3	51	122	51	122	-----
PCB 101	37680-73-2	3	µg/kg	<3	5 µg/kg	77.9	46	122	46	122	-----
PCB 105	32598-14-4	3	µg/kg	<3	5 µg/kg	80.6	52	122	52	122	-----
PCB 118	31508-00-6	3	µg/kg	<3	5 µg/kg	79.8	50	123	50	123	-----
PCB 126	57465-28-8	3	µg/kg	<3	5 µg/kg	84.0	53	121	53	121	-----
PCB 128	38380-07-3	3	µg/kg	<3	5 µg/kg	80.8	54	124	54	124	-----
PCB 138	35065-28-2	3	µg/kg	<3	5 µg/kg	79.2	51	123	51	123	-----
PCB 153	35065-27-1	3	µg/kg	<3	5 µg/kg	80.3	51	124	51	124	-----



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 Recovery (%)			Recovery Limits (%)			RPD (%)
					LCS	DCS	High	Low	High	Value		Control Limit
EP-065: PCB Single Congeners (QC Lot: 3869064) - Continued											
PCB 169	32774-16-6	3	µg/kg	<3	84.3		55	126			
PCB 170	35065-30-6	3	µg/kg	<3	83.0		58	124			
PCB 180	35065-29-3	3	µg/kg	<3	81.6		56	126			
PCB 187	52663-68-0	3	µg/kg	<3	79.6		51	123			
Total Polychlorinated biphenyls		18	µg/kg	<18							
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3864600)											
Naphthalene	91-20-3	25	µg/kg	<50	95.2		68	107			
Acenaphthylene	208-96-8	25	µg/kg	<50	95.7		70	113			
Acenaphthene	83-32-9	25	µg/kg	<50	93.4		68	108			
Fluorene	86-73-7	25	µg/kg	<50	98.9		71	111			
Phenanthrene	85-01-8	25	µg/kg	<50	98.0		71	110			
Anthracene	120-12-7	25	µg/kg	<50	97.0		63	117			
Fluoranthene	206-44-0	25	µg/kg	<50	97.2		72	113			
Pyrene	129-00-0	25	µg/kg	<50	96.2		72	112			
Benzo(a)anthracene	56-55-3	25	µg/kg	<50	95.3		70	119			
Chrysene	218-01-9	25	µg/kg	<50	96.8		79	112			
Benzo(b)fluoranthene	205-99-2	25	µg/kg	<50	101		68	125			
Benzo(k)fluoranthene	207-08-9	25	µg/kg	<50	96.6		75	113			
Benzo(a)pyrene	50-32-8	25	µg/kg	<50	94.6		64	118			
Indeno(1,2,3-cd)pyrene	193-39-5	25	µg/kg	<50	120		61	127			
Dibenz(a,h)anthracene	53-70-3	25	µg/kg	<50	99.9		66	112			
Benzo(g,h,i)perylene	191-24-2	25	µg/kg	<50	107		73	114			
Low M.W. PAHs		550	µg/kg	<550							
High M.W. PAHs		1700	µg/kg	<1700							

Matrix: WATER

Method Blank (MB) Report

Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report

Method: Compound	CAS Number	LOR	Unit	Result	Spike Recovery (%)			Recovery Limits (%)			RPD (%)
					LCS	DCS	High	Low	High	Value		Control Limit
EP-390: Triorganotins (QC Lot: 3877654)											
Tributyltin	56573-85-4	5	ngSn/L	<5	121		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	MS	MSD	Recovery Limits (%)	RPD (%)	
				MS	MSD	Low	High	Value	Control Limit
EG: Metals and Major Cations (QC Lot: 3878754)									
HK1509806-001	RGS1								
		EG020: Arsenic	7440-38-2	5 mg/kg	81.5		75	125	
		EG020: Cadmium	7440-43-9	5 mg/kg	98.7		75	125	
		EG020: Chromium	7440-47-3	50 mg/kg	94.9		75	125	
		EG020: Copper	7440-50-8	50 mg/kg	97.7		75	125	
		EG020: Lead	7439-92-1	5 mg/kg	# Not Determined		75	125	
		EG020: Mercury	7439-97-6	0.1 mg/kg	113		75	125	
		EG020: Nickel	7440-02-0	50 mg/kg	96.0		75	125	
		EG020: Silver	7440-22-4	5 mg/kg	77.4		75	125	
		EG020: Zinc	7440-66-6	5 mg/kg	# Not Determined		75	125	

Matrix: WATER

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report					
				Spike Concentration	MS	MSD	Recovery Limits (%)	RPD (%)	
				MS	MSD	Low	High	Value	Control Limit
EP-390: Triorganotins (QC Lot: 3877654)									
HK1509628-001	Anonymous								
		Tributyltin	56573-85-4	2 ngSn/L	98.8		70	130	

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
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

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ANALYTICAL CHEMISTRY & TESTING SERVICES



CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 5
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1509808
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E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
Facsimile	: ----	Facsimile	: +852 2610 2021		
Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 20-MAR-2015
Order number	: GE/2014/21.01			Issue Date	: 02-APR-2015
C-O-C number	: H026552			No. of samples received	: 1
Site	: ----			No. of samples analysed	: 1

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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

Chan Ka Yu, Karen
Fung Lim Chee, Richard

Position

Manager - Organics
General Manager
Organics
Inorganics

Authorised results for

ALS Laboratory Group

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Page Number : 2 of 5
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1509808

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:

01-APR-2015

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: **HK1509808**

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

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.

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



Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	LOR	Client sample ID		RGS1
			Client sampling date / time	Unit	
EAI/ED: Physical and Aggregate Properties					
EA055: Moisture Content (dried @ 103° C)	----	0.1	%		48.2
ED/IEK: Inorganic Nonmetallic Parameters					
EK055: Ammonia as N	7664-417	0.1	mg/kg		11.0
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg		<0.1
EK058A: Nitrate as N (Sol.)	----	0.1	mg/kg		0.2
EK061A: Total Kjeldahl Nitrogen as N	----	1	mg/kg		1170
EK067A: Total Phosphorus as P	----	1	mg/kg		448
EP-067_SR-A: Organochlorine Pesticides (OC)					
alpha-BHC	319-84-6	0.50	mg/kg		<0.50
beta-BHC	319-85-7	0.50	mg/kg		<0.50
gamma-BHC	58-89-9	0.50	mg/kg		<0.50
delta-BHC	319-86-8	0.50	mg/kg		<0.50
Heptachlor	76-44-8	0.50	mg/kg		<0.50
Aldrin	309-00-2	0.50	mg/kg		<0.50
Heptachlor epoxide	1024-57-3	0.50	mg/kg		<0.50
Endosulfan 1	959-98-8	0.50	mg/kg		<0.50
4,4' -DDE	72-55-9	0.50	mg/kg		<0.50
4,4' -DDD	72-54-8	0.50	mg/kg		<0.50
Endosulfan sulfate	103107-8	0.50	mg/kg		<0.50
4,4' -DDT	50-29-3	0.50	mg/kg		<0.50
EP-067_SR-S: Pesticide Surrogate					
Tetrachlorometaxylene	877-09-8	0.1	%		75.0
Dibutylchlorodate	1770-80-5	0.1	%		86.6
Surrogate control limits listed at end of this report.					



Laboratory Duplicate (DUP) Report

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Laboratory Duplicate (DUP) Report			RPD (%)
						Original Result	Duplicate Result	Duplicate Result	
EA/ED: Physical and Aggregate Properties (QC Lot: 3869718)									
HK1509528-010	Anonymous	EA055: Moisture Content (dried @ 103°C)	----	0.1	%	4.5	4.1	4.1	9.8
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3875844)									
HK1509492-001	Anonymous	EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	24500	21700	21700	12.4
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3875845)									
HK1509808-001	RGS1	EK067A: Total Phosphorus as P	----	1	mg/kg	448	436	436	2.6
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3877712)									
HK1509808-001	RGS1	EK055: Ammonia as N	7664-41-7	0.1	mg/kg	11.0	10.8	10.8	1.1
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3872133)									
HK1509808-001	RGS1	alpha-BHC	319-84-6	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		beta-BHC	319-85-7	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		gamma-BHC	58-89-9	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		delta-BHC	319-86-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Heptachlor	76-44-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Aldrin	309-00-2	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Heptachlor epoxide	1024-57-3	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Endosulfan 1	959-98-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		4.4'-DDE	72-55-9	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		4.4'-DDD	72-54-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		Endosulfan sulfate	1031-07-8	0.50	mg/kg	<0.50	<0.50	<0.50	0.0
		4.4'-DDT	50-29-3	0.50	mg/kg	<0.50	<0.50	<0.50	0.0

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

Method: Compound	CAS Number	LOR	Unit	Result	Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report			
					Spike Concentration	Spike Recovery (%)	DCS	Recovery Limits (%)	Recovery Low	Recovery High	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3869730)												
EK057A: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1		2 mg/kg	109	85	85	115	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3875844)												
EK061A: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20		1000 mg/kg	100	85	85	115	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3875845)												
EK067A: Total Phosphorus as P	----	20	mg/kg	<20		695 mg/kg	87.8	85	85	115	115	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3877712)												
EK055: Ammonia as N	7664-41-7	1	mg/kg	<1		5 mg/kg	104	89	89	113	113	-----
EP-067_SR-A: Organichlorine Pesticides (OC) (QC Lot: 3872133)												
alpha-BHC	319-84-6	0.05	mg/kg	<0.05		0.25 mg/kg	69.2	55	55	106	106	-----
beta-BHC	319-85-7	0.05	mg/kg	<0.05		0.25 mg/kg	78.0	37	37	123	123	-----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05		0.25 mg/kg	81.2	43	43	112	112	-----
delta-BHC	319-86-8	0.05	mg/kg	<0.05		0.25 mg/kg	105	64	64	113	113	-----
Heptachlor	76-44-8	0.05	mg/kg	<0.05		0.25 mg/kg	92.0	42	42	113	113	-----
Aldrin	309-00-2	0.05	mg/kg	<0.05		0.25 mg/kg	80.8	57	57	106	106	-----



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	LCS	DCS	Recovery Limits (%)	Value	RPD (%)	Control Limit
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3872133) - Continued											
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.25 mg/kg	93.6	-----	61	108	-----	-----
Endosulfan 1	959-98-8	0.05	mg/kg	<0.05	0.25 mg/kg	96.6	-----	55	120	-----	-----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.25 mg/kg	108	-----	60	116	-----	-----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.25 mg/kg	111	-----	52	127	-----	-----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.25 mg/kg	87.6	-----	56	120	-----	-----
4,4'-DDT	50-29-3	0.05	mg/kg	<0.05	0.25 mg/kg	96.4	-----	45	126	-----	-----

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

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

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: SEDIMENT			
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

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CERTIFICATE OF ANALYSIS

Client	: CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT	Laboratory	: ALS Technichem HK Pty Ltd	Page	: 1 of 10
Contact	: MR SUN NG	Contact	: Fung Lim Chee, Richard	Work Order	: HK1509809
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E-mail	: sunng@cedd.gov.hk	E-mail	: Richard.Fung@alsglobal.com		
Telephone	: ----	Telephone	: +852 2610 1044		
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Project	: AGREEMENT NO CE63_2012 (DS) EXPANSION OF SHA TAU KOK SEWAGE TREATMENT WORKS PHASE 1	Quote number	: HK/1393/2014	Date Samples Received	: 20-MAR-2015
Order number	: GE/2014/21.01			Issue Date	: 08-APR-2015
C-O-C number	: H026599			No. of samples received	: 2
Site	: ----			No. of samples analysed	: 2

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Signatories

Position

Authorised results for

Chan Ka Yu, Karen
Fung Lim Chee, Richard

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Page Number : 2 of 10
Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
Work Order : HK1509809

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: 08-APR-2015

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: **HK1509809**

Project Name: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction.

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.

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



Page Number : 3 of 10
 Client : CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT
 Work Order : HK1509809

Analytical Results

Sub-Matrix: SEDIMENT

Compound	CAS Number	Client sample ID		RGS1	RGS1
		LOR	Unit		
Client sampling date / time					
Unit					
EP-390: Triorganotins	56573-85-4	0.015	µg TBT /L	[20-MAR-2015] HK1509809-001	RGS1 ELUTRIATE BLK [20-MAR-2015] HK1509809-002
Tributyltin				<0.015	<0.015



Compound	CAS Number	LOR	Client sample ID		RGS1	RGS1
			Client sampling date / time	Unit		
Sub-Matrix: ELUTRIATE						
ED/EK: Inorganic Nonmetallic Parameters						
EK055K: Ammonia as N	7664-41-7	0.01			ELUTRIATE BLK	
EK057A: Nitrite as N	----	0.01			[20-MAR-2015]	
EK058A: Nitrate as N	14797-55-8	0.01			HK1509809-001	HK1509809-002
EK061P: Total Kjeldahl Nitrogen as N	----	0.1			1.10	0.05
EK067P: Total Phosphorus as P	----	0.01			<0.01	<0.01
EK071K: Reactive Phosphorus as P	14265-44-2	10			1.8	0.2
					0.16	<0.01
					10	<10
EG: Metals and Major Cations - Filtered						
EG020: Arsenic	7440-38-2	10			<10	<10
EG020: Cadmium	7440-43-9	0.2			<0.2	<0.2
EG020: Chromium	7440-47-3	1			<1	<1
EG020: Copper	7440-50-8	1			<1	<1
EG020: Lead	7439-92-1	1			<1	<1
EG020: Mercury	7439-97-6	0.5			<0.5	<0.5
EG020: Nickel	7440-02-0	1			<1	<1
EG020: Silver	7440-22-4	1			<1	<1
EG020: Zinc	7440-66-6	10			<10	<10
EP-065A: PCB Single Congeners						
PCB 8	34883-43-7	0.01			<0.01	<0.01
PCB 18	37680-65-2	0.01			<0.01	<0.01
PCB 28	7012-37-5	0.01			<0.01	<0.01
PCB 44	41464-39-5	0.01			<0.01	<0.01
PCB 52	35693-99-3	0.01			<0.01	<0.01
PCB 66	32598-10-0	0.01			<0.01	<0.01
PCB 77	32598-13-3	0.01			<0.01	<0.01
PCB 101	37680-73-2	0.01			<0.01	<0.01
PCB 105	32598-14-4	0.01			<0.01	<0.01
PCB 118	31508-00-6	0.01			<0.01	<0.01
PCB 126	57465-28-8	0.01			<0.01	<0.01
PCB 128	38380-07-3	0.01			<0.01	<0.01
PCB 138	35065-28-2	0.01			<0.01	<0.01
PCB 153	35065-27-1	0.01			<0.01	<0.01
PCB 169	32774-16-6	0.01			<0.01	<0.01
PCB 170	35065-30-6	0.01			<0.01	<0.01
PCB 180	35065-29-3	0.01			<0.01	<0.01
PCB 187	52663-68-0	0.01			<0.01	<0.01
Total Polychlorinated biphenyls	----	0.18			<0.18	<0.18
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	91-20-3	0.2			<0.2	<0.2
Acenaphthylene	208-96-8	0.2			<0.2	<0.2



Sub-Matrix: ELUTRIATE		Client sample ID		RGS1	RGS1
Compound	CAS Number	LOR	Unit	[20-MAR-2015]	ELUTRIATE BLK [20-MAR-2015]
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) - Continued					
Acenaphthene	83-32-9	0.2	µg/L	<0.2	<0.2
Fluorene	86-73-7	0.2	µg/L	<0.2	<0.2
Phenanthrene	85-01-8	0.2	µg/L	<0.2	<0.2
Anthracene	120-12-7	0.2	µg/L	<0.2	<0.2
Fluoranthene	206-44-0	0.2	µg/L	<0.2	<0.2
Pyrene	129-00-0	0.2	µg/L	<0.2	<0.2
Benzo(a)anthracene	56-55-3	0.2	µg/L	<0.2	<0.2
Chrysene	218-019	0.2	µg/L	<0.2	<0.2
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	<0.2
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	<0.2
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	<0.2
Benzo(g,h,i)perylene	19124-2	0.2	µg/L	<0.2	<0.2
Low M.W. PAHs	----	2.2	µg/L	<2.2	<2.2
High M.W. PAHs	----	6.8	µg/L	<6.8	<6.8
EP-067_SR-A: Organochlorine Pesticides (OC)					
alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1
beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1
gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1
delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1
Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1
Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1
Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1
Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1
4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1
4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1
Endosulfan sulfate	103107-8	0.1	µg/L	<0.1	<0.1
4,4'-DDT	50-29-3	0.1	µg/L	<0.1	<0.1
Surrogate control limits listed at end of this report.					
EP-076S: Polycyclic Aromatics Hydrocarbons (PAHs) Surrogates					
2-Fluorobiphenyl	32160-8	0.1	%	91.8	104
4-Terphenyl-d14	1718-510	0.1	%	120	117
Surrogate control limits listed at end of this report.					
EP-065S: PCB Congeners and Organochlorine Pesticides Surrogate					
Decachlorobiphenyl	205124-3	0.1	%	88.9	120
Surrogate control limits listed at end of this report.					
EP-067_SR-S: Pesticide Surrogate					
Tetrachlorometaxylene	877-09-8	0.1	%	58.8	51.8
Dibutylchlorodate	1770-80-5	0.1	%	73.4	97.9
Surrogate control limits listed at end of this report.					



Laboratory Duplicate (DUP) Report

Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883952)									
HK1509809-001	RGS1		EK055K: Ammonia as N	7664-41-7	0.01	mg/L	1.10	1.09	0.9
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883953)									
HK1509809-001	RGS1		EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	0.01	0.01	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883954)									
HK1509809-001	RGS1		EK057A: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883958)									
HK1509809-002	RGS1 ELUTRIATE BLK		EK067P: Total Phosphorus as P	----	0.01	mg/L	<0.01	<0.01	0.0
EG: Metals and Major Cations - Filtered (QC Lot: 3884940)									
HK1509809-002	RGS1 ELUTRIATE BLK		EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0
			EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	<0.5	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	<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: Zinc	7440-66-6	10	µg/L	<10	<10	0.0
EP-065A: PCB Single Congeners (QC Lot: 3872575)									
HK1509809-002	RGS1 ELUTRIATE BLK		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 44	41464-39-5	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 66	32598-10-0	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 101	37680-73-2	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 118	31508-00-6	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 128	38380-07-3	0.01	µg/L	<0.01	<0.01	0.0
			PCB 138	35065-28-2	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 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
			PCB 180	35065-29-3	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
			Total Polychlorinated biphenyls	----	0.18	µg/L	<0.18	<0.18	0.0
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3872574)									
HK1509809-002	RGS1 ELUTRIATE BLK		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



Matrix: WATER		Laboratory Duplicate (DUP) Report		Laboratory Duplicate (DUP) Report		Laboratory Duplicate (DUP) Report		
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3872574) - Continued								
HK1509809-002	RGS1 ELUTRIATE BLK	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
		Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	<0.2	0.0
		Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	<0.2	0.0
		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
		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-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3872576)								
HK1509809-002	RGS1 ELUTRIATE BLK	alpha-BHC	319-84-6	0.1	µg/L	<0.1	<0.1	0.0
		beta-BHC	319-85-7	0.1	µg/L	<0.1	<0.1	0.0
		gamma-BHC	58-89-9	0.1	µg/L	<0.1	<0.1	0.0
		delta-BHC	319-86-8	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor	76-44-8	0.1	µg/L	<0.1	<0.1	0.0
		Aldrin	309-00-2	0.1	µg/L	<0.1	<0.1	0.0
		Heptachlor epoxide	1024-57-3	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan 1	959-98-8	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDE	72-55-9	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDD	72-54-8	0.1	µg/L	<0.1	<0.1	0.0
		Endosulfan sulfate	1031-07-8	0.1	µg/L	<0.1	<0.1	0.0
		4,4'-DDD	50-29-3	0.1	µg/L	<0.1	<0.1	0.0
EP-390: Triorganotins (QC Lot: 3877653)								
HK1509809-001	RGS1	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				
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	Control Limit
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883952)										
EK059K: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	99.6	92	108	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883953)										
EK071K: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	101	94	104	-----	-----
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883954)										
EK057A: Nitrite as N	-----	0.01	mg/L	<0.01	0.05 mg/L	104	88	114	-----	-----
EK067P: Total Phosphorus as P	-----	0.01	mg/L	<0.01	0.4 mg/L	109	98	112	-----	-----



Matrix: WATER

		Method Blank (MB) Report				Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report					
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	Spike Recovery (%)	DCS	Recovery Limits (%)	Value	Control Limit
EG: Metals and Major Cations - Filtered (QC Lot: 3884940)											
EG020: Arsenic	7440-38-2	10	µg/L	<10	10 µg/L	96.2	-----	-----	76	116	-----
EG020: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	101	-----	-----	81	109	-----
EG020: Chromium	7440-47-3	1	µg/L	<1	10 µg/L	90.0	-----	-----	80	112	-----
EG020: Copper	7440-50-8	1	µg/L	<1	10 µg/L	92.3	-----	-----	79	115	-----
EG020: Lead	7439-92-1	1	µg/L	<1	10 µg/L	103	-----	-----	82	108	-----
EG020: Mercury	7439-97-6	0.5	µg/L	<0.5	2 µg/L	112	-----	-----	82	118	-----
EG020: Nickel	7440-02-0	1	µg/L	<1	10 µg/L	101	-----	-----	79	115	-----
EG020: Silver	7440-22-4	1	µg/L	<1	10 µg/L	96.5	-----	-----	78	106	-----
EG020: Zinc	7440-66-6	10	µg/L	<10	10 µg/L	99.1	-----	-----	77	119	-----
EP-065A: PCB Single Congeners (QC Lot: 3872575)											
PCB 8	34883-43-7	0.01	µg/L	<0.01	0.1 µg/L	52.4	-----	-----	50	130	-----
PCB 18	37680-65-2	0.01	µg/L	<0.01	0.1 µg/L	53.4	-----	-----	50	130	-----
PCB 28	7012-37-5	0.01	µg/L	<0.01	0.1 µg/L	55.2	-----	-----	50	130	-----
PCB 44	41464-39-5	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	60.3	-----	-----	50	130	-----
PCB 66	32598-10-0	0.01	µg/L	<0.01	0.1 µg/L	59.8	-----	-----	50	130	-----
PCB 77	32598-13-3	0.01	µg/L	<0.01	0.1 µg/L	102	-----	-----	50	130	-----
PCB 101	37680-73-2	0.01	µg/L	<0.01	0.1 µg/L	107	-----	-----	50	130	-----
PCB 105	32598-14-4	0.01	µg/L	<0.01	0.1 µg/L	101	-----	-----	50	130	-----
PCB 118	31508-00-6	0.01	µg/L	<0.01	0.1 µg/L	101	-----	-----	50	130	-----
PCB 126	57465-28-8	0.01	µg/L	<0.01	0.1 µg/L	98.6	-----	-----	50	130	-----
PCB 128	38380-07-3	0.01	µg/L	<0.01	0.1 µg/L	97.4	-----	-----	50	130	-----
PCB 138	35065-28-2	0.01	µg/L	<0.01	0.1 µg/L	100	-----	-----	50	130	-----
PCB 153	35065-27-1	0.01	µg/L	<0.01	0.1 µg/L	103	-----	-----	50	130	-----
PCB 169	32774-16-6	0.01	µg/L	<0.01	0.1 µg/L	91.1	-----	-----	50	130	-----
PCB 170	35065-30-6	0.01	µg/L	<0.01	0.1 µg/L	93.6	-----	-----	50	130	-----
PCB 180	35065-29-3	0.01	µg/L	<0.01	0.1 µg/L	94.7	-----	-----	50	130	-----
PCB 187	52663-68-0	0.01	µg/L	<0.01	0.1 µg/L	101	-----	-----	50	130	-----
Total Polychlorinated biphenyls	-----	0.18	µg/L	<0.18	-----	-----	-----	-----	-----	-----	-----
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3872574)											
Naphthalene	91-20-3	0.2	µg/L	<0.2	0.5 µg/L	63.1	-----	-----	50	98	-----
Acenaphthylene	208-96-8	0.2	µg/L	<0.2	0.5 µg/L	54.3	-----	-----	47	97	-----
Acenaphthene	83-32-9	0.2	µg/L	<0.2	0.5 µg/L	52.3	-----	-----	49	93	-----
Fluorene	86-73-7	0.2	µg/L	<0.2	0.5 µg/L	54.8	-----	-----	52	92	-----
Phenanthrene	85-01-8	0.2	µg/L	<0.2	0.5 µg/L	58.8	-----	-----	51	91	-----
Anthracene	120-12-7	0.2	µg/L	<0.2	0.5 µg/L	59.0	-----	-----	48	95	-----
Fluoranthene	206-44-0	0.2	µg/L	<0.2	0.5 µg/L	78.9	-----	-----	68	109	-----
Pyrene	129-00-0	0.2	µg/L	<0.2	0.5 µg/L	81.1	-----	-----	69	111	-----
Benzo(a)anthracene	56-55-3	0.2	µg/L	<0.2	0.5 µg/L	90.3	-----	-----	64	119	-----
Chrysene	218-01-9	0.2	µg/L	<0.2	0.5 µg/L	93.3	-----	-----	50	124	-----
Benzo(b)fluoranthene	205-99-2	0.2	µg/L	<0.2	0.5 µg/L	75.0	-----	-----	54	124	-----
Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<0.2	0.5 µg/L	74.4	-----	-----	54	130	-----
Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.2	0.5 µg/L	61.4	-----	-----	60	120	-----



Matrix: WATER

Method Blank (MB) Report		Laboratory Control Spike (LCS) and Laboratory Control Spike Duplicate (DCS) Report									
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	LCS	DCS	Recovery Low (%)	Recovery High (%)	Value	RPD (%)
EP-076HK: Polycyclic Aromatic Hydrocarbons (PAHs) (QC Lot: 3872574) - Continued											
Indeno(1,2,3-cd)pyrene	193-39-5	0.2	µg/L	<0.2	0.5 µg/L	61.2	-----	60	119	-----	-----
Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	<0.2	0.5 µg/L	60.3	-----	48	120	-----	-----
Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	<0.2	0.5 µg/L	61.1	-----	52	125	-----	-----
Low M.W. PAHs	-----	2.2	µg/L	<2.2	-----	-----	-----	-----	-----	-----	-----
High M.W. PAHs	-----	6.8	µg/L	<6.8	-----	-----	-----	-----	-----	-----	-----
EP-067_SR-A: Organochlorine Pesticides (OC) (QC Lot: 3872576)											
alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	70.2	-----	34	123	-----	-----
beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	77.4	-----	55	128	-----	-----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	77.6	-----	45	118	-----	-----
delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	107	-----	59	114	-----	-----
Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	96.8	-----	42	104	-----	-----
Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	106	-----	45	117	-----	-----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	104	-----	57	116	-----	-----
Endosulfan 1	959-98-8	0.5	µg/L	<0.5	5 µg/L	98.4	-----	55	120	-----	-----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	98.2	-----	63	122	-----	-----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	93.0	-----	54	134	-----	-----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	88.2	-----	67	123	-----	-----
4,4'-DDT	50-29-3	0.5	µg/L	<0.5	5 µg/L	63.4	-----	43	121	-----	-----
EP-390: Triorganotins (QC Lot: 3877653)											
Tributyltin	56573-85-4	5	ngSn/L	<5	2 ngSn/L	106	-----	70	130	-----	-----



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

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report			RPD (%)		
				Spike Concentration	MSD	Recovery Limits (%)			
				MS	High	Value	Control Limit		
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883952)									
HK1509809-002	RGS1 ELUTRIATE BLK	EK055K: Ammonia as N	7664-41-7	93.6	98.6	75	125	5.2	25
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883953)									
HK1509809-002	RGS1 ELUTRIATE BLK	EK071K: Reactive Phosphorus as P	14265-44-2	101	103	75	125	1.2	25
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883954)									
HK1509809-002	RGS1 ELUTRIATE BLK	EK057A: Nitrite as N	----	106	108	75	125	1.9	25
ED/EK: Inorganic Nonmetallic Parameters (QC Lot: 3883958)									
HK1509809-002	RGS1 ELUTRIATE BLK	EK067P: Total Phosphorus as P	----	96.0	104	75	125	8.0	25
EG: Metals and Major Cations - Filtered (QC Lot: 3884940)									
HK1509809-001	RGS1	EG020: Arsenic	7440-38-2	10 µg/L	80.0	75	125	2.7	25
		EG020: Cadmium	7440-43-9	10 µg/L	98.1	75	125	4.4	25
		EG020: Chromium	7440-47-3	10 µg/L	89.4	75	125	0.3	25
		EG020: Copper	7440-50-8	10 µg/L	90.1	75	125	8.8	25
		EG020: Lead	7439-92-1	10 µg/L	96.7	75	125	4.9	25
		EG020: Mercury	7439-97-6	2 µg/L	94.0	75	125	7.2	25
		EG020: Nickel	7440-02-0	10 µg/L	106	75	125	3.4	25
		EG020: Silver	7440-22-4	10 µg/L	93.3	75	125	5.5	25
		EG020: Zinc	7440-66-6	10 µg/L	# Not Determined	75	125	# Not Determined	25
EP-390: Triorganotins (QC Lot: 3877653)									
HK1509809-002	RGS1 ELUTRIATE BLK	Tributyltin	56573-85-4	128	115	70	130	10.9	20

Surrogate Control Limits

Compound	CAS Number	Recovery Limits (%)	
		Low	High
Sub-Matrix: ELUTRIATE			
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
EP-067_SR-S: Pesticide Surrogate			
Tetrachlorometaxylene	877-09-8	50	130
Dibutylchlorendate	1770-80-5	50	130

Section 3

Summary of Sample Receipt Condition,
Analysis Date and Method Reference

Summary of Sample Receipt Condition, Analysis Date and Method Reference

Date of Issue: 23/04/2015
Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	Client Sample ID	Sampling Date	Receipt Details			Storage Condition*	Testing Date		
			Date	Time	Condition		Metals	Organic	Inorganic
HK1504765001	SD3 0M-0.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504765002	SD3 0.9M-1.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504765003	SD3 1.9M-2.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504765004	SD3 2.9M-3.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504765005	SD3 3.9M-4.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504765006	SD3 4.9M-5.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504825001	GB1	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504825002	GB2	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504825003	GB4	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504825004	GB5	2/02/2015	2/02/2015	17:15	ambient	4°C	11/02/2015	10/02/2015	--
HK1504839001	SD3 0M-0.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504839002	SD3 0.9M-1.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504839003	SD3 1.9M-2.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504839004	SD3 2.9M-3.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504839005	SD3 3.9M-4.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504839006	SD3 4.9M-5.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504844001	GB1	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504844002	GB2	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504844003	GB4	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504844004	GB5	2/02/2015	2/02/2015	17:15	ambient	4°C	--	10/02/2015	15/02/2015
HK1504948001	SD3 0M-0.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504948002	SD3 0.9M-1.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504948003	SD3 1.9M-2.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504948004	SD3 2.9M-3.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504948005	SD3 3.9M-4.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504948006	SD3 4.9M-5.9M	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504948007	SD3 ELUTRIATE BLK	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504949001	GB1	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504949002	GB2	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504949003	GB4	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504949004	GB5	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504949005	GB1 ELUTRIATE BLK	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504949006	GB2 ELUTRIATE BLK	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015

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Client: Civil Engineering and Development Department
Service Order No.: GE/2014/21.01
Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	Client Sample ID	Sampling Date	Receipt Details		Storage Condition*	Testing Date			
			Date	Time		Condition	Metals	Organic	Inorganic
HK1504949007	GB4 ELUTRIATE BLK	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504949008	GB5 ELUTRIATE BLK	2/02/2015	2/02/2015	17:15	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504950001	SD5 0M-0.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	11/02/2015	10/02/2015	--
HK1504950002	SD5 0.9M-1.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	11/02/2015	10/02/2015	--
HK1504950003	SD5 1.9M-2.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	11/02/2015	10/02/2015	--
HK1504950004	SD5 2.9M-3.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	11/02/2015	10/02/2015	--
HK1504951001	SD5 0M-0.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	--	10/02/2015	16/02/2015
HK1504951002	SD5 0.9M-1.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	--	10/02/2015	16/02/2015
HK1504951003	SD5 1.9M-2.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	--	10/02/2015	16/02/2015
HK1504951004	SD5 2.9M-3.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	--	10/02/2015	16/02/2015
HK1504952001	SD5 0M-0.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	17/02/2015	18/02/2015	18/02/2015
HK1504952002	SD5 0.9M-1.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	17/02/2015	18/02/2015	18/02/2015
HK1504952003	SD5 1.9M-2.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	17/02/2015	18/02/2015	18/02/2015
HK1504952004	SD5 2.9M-3.9M	3/02/2015	3/02/2015	17:00	ambient	4°C	17/02/2015	18/02/2015	18/02/2015
HK1504952005	SD5 ELUTRIATE BLK	3/02/2015	3/02/2015	17:00	ambient	4°C	17/02/2015	18/02/2015	18/02/2015
HK1504953001	SD2 0M-0.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	11/02/2015	11/02/2015	--
HK1504953002	SD2 0.9M-1.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	11/02/2015	11/02/2015	--
HK1504953003	SD2 1.9M-2.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	11/02/2015	11/02/2015	--
HK1504953004	SD2 2.9M-3.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	11/02/2015	11/02/2015	--
HK1504953005	SD2 5.9M-6.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	11/02/2015	11/02/2015	--
HK1504954001	SD2 0M-0.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	--	11/02/2015	16/02/2015
HK1504954002	SD2 0.9M-1.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	--	11/02/2015	16/02/2015
HK1504954003	SD2 1.9M-2.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	--	11/02/2015	16/02/2015
HK1504954004	SD2 2.9M-3.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	--	11/02/2015	16/02/2015
HK1504954005	SD2 5.9M-6.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	--	11/02/2015	16/02/2015
HK1504955001	GB3	4/02/2015	4/02/2015	17:10	chilled	4°C	10/02/2015	11/02/2015	--
HK1504955002	GB8	4/02/2015	4/02/2015	17:10	chilled	4°C	10/02/2015	11/02/2015	--
HK1504956001	GB3	4/02/2015	4/02/2015	17:10	chilled	4°C	--	16/02/2015	16/02/2015
HK1504956002	GB8	4/02/2015	4/02/2015	17:10	chilled	4°C	--	16/02/2015	16/02/2015
HK1504957001	SD2 0M-0.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504957002	SD2 0.9M-1.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504957003	SD2 1.9M-2.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504957004	SD2 2.9M-3.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015

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ALS Lab ID	Client Sample ID	Sampling Date	Receipt Details		Storage Condition*	Testing Date			
			Date	Time		Condition	Metals	Organic	Inorganic
HK1504957005	SD2 5.9M-6.9M	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504957006	SD2 ELUTRIATE BLK	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504958001	GB3	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504958002	GB8	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504958003	GB3 ELUTRIATE BLK	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1504958004	GB8 ELUTRIATE BLK	4/02/2015	4/02/2015	17:10	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1505107001	SD1 0M-0.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	11/02/2015	11/02/2015	--
HK1505107002	SD1 0.9M-1.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	11/02/2015	11/02/2015	--
HK1505107003	SD1 1.9M-2.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	11/02/2015	11/02/2015	--
HK1505107004	SD1 2.9M-3.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	11/02/2015	11/02/2015	--
HK1505110001	SD1 0M-0.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	--	11/02/2015	16/02/2015
HK1505110002	SD1 0.9M-1.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	--	11/02/2015	16/02/2015
HK1505110003	SD1 1.9M-2.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	--	11/02/2015	16/02/2015
HK1505110004	SD1 2.9M-3.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	--	11/02/2015	16/02/2015
HK1505112001	SD1 0M-0.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1505112002	SD1 0.9M-1.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1505112003	SD1 1.9M-2.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1505112004	SD1 2.9M-3.9M	5/02/2015	5/02/2015	16:40	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1505112005	SD1 ELUTRIATE BLK	5/02/2015	5/02/2015	16:40	ambient	4°C	17/02/2015	18/02/2015	17/02/2015
HK1505113001	SD4 0M-0.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	17/02/2015	18/02/2015	--
HK1505113002	SD4 0.9M-1.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	17/02/2015	18/02/2015	--
HK1505113003	SD4 1.9M-2.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	17/02/2015	18/02/2015	--
HK1505113004	SD4 2.9M-3.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	17/02/2015	18/02/2015	--
HK1505114001	SD4 0M-0.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	--	18/02/2015	18/02/2015
HK1505114002	SD4 0.9M-1.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	--	18/02/2015	18/02/2015
HK1505114003	SD4 1.9M-2.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	--	18/02/2015	18/02/2015
HK1505114004	SD4 2.9M-3.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	--	18/02/2015	18/02/2015
HK1505116001	SD4 0M-0.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	17/02/2015	18/02/2015	25/02/2015
HK1505116002	SD4 0.9M-1.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	17/02/2015	18/02/2015	25/02/2015
HK1505116003	SD4 1.9M-2.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	17/02/2015	18/02/2015	25/02/2015
HK1505116004	SD4 2.9M-3.9M	6/02/2015	6/02/2015	16:45	ambient	4°C	17/02/2015	18/02/2015	25/02/2015
HK1505116005	SD4 ELUTRIATE BLK	6/02/2015	6/02/2015	16:45	ambient	4°C	17/02/2015	18/02/2015	25/02/2015
HK1505591001	GB6	10/02/2015	10/02/2015	14:00	chilled	4°C	16/02/2015	18/02/2015	--

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Project: Agreement No. CE 63/2012 (DS) Expansion of Sha Tau Kok Sewage Treatment Works, Phase 1 - Investigation, Design and Construction

ALS Lab ID	Client Sample ID	Sampling Date	Receipt Details			Storage Condition*	Testing Date		
			Date	Time	Condition		Metals	Organic	Inorganic
HK1505591002	GB7	10/02/2015	10/02/2015	14:00	chilled	4°C	16/02/2015	18/02/2015	--
HK1505597001	GB6	10/02/2015	10/02/2015	16:00	chilled	4°C	--	18/02/2015	16/02/2015
HK1505597002	GB7	10/02/2015	10/02/2015	16:00	chilled	4°C	--	18/02/2015	16/02/2015
HK1505598001	GB6	10/02/2015	10/02/2015	16:00	ambient	4°C	17/02/2015	18/02/2015	24/02/2015
HK1505598002	GB7	10/02/2015	10/02/2015	16:00	ambient	4°C	17/02/2015	18/02/2015	24/02/2015
HK1505598003	GB6 ELUTRIATE BLK	10/02/2015	10/02/2015	16:00	ambient	4°C	17/02/2015	18/02/2015	24/02/2015
HK1505598004	GB7 ELUTRIATE BLK	10/02/2015	10/02/2015	16:00	ambient	4°C	17/02/2015	18/02/2015	24/02/2015
HK1506963001	SD6 0M-0.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	10/03/2015	9/03/2015	--
HK1506963002	SD6 0.9M-1.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	10/03/2015	9/03/2015	--
HK1506963003	SD6 1.9M-2.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	10/03/2015	9/03/2015	--
HK1506963004	SD6 2.9M-3.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	10/03/2015	9/03/2015	--
HK1506963005	SD6 5.9M-6.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	10/03/2015	9/03/2015	--
HK1506971001	SD6 0M-0.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	--	3/03/2015	10/03/2015
HK1506971002	SD6 0.9M-1.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	--	3/03/2015	10/03/2015
HK1506971003	SD6 1.9M-2.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	--	3/03/2015	10/03/2015
HK1506971004	SD6 2.9M-3.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	--	3/03/2015	10/03/2015
HK1506971005	SD6 5.9M-6.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	--	3/03/2015	10/03/2015
HK1506978001	SD6 0M-0.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	7/03/2015	9/03/2015	11/03/2015
HK1506978002	SD6 0.9M-1.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	7/03/2015	9/03/2015	11/03/2015
HK1506978003	SD6 1.9M-2.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	7/03/2015	9/03/2015	11/03/2015
HK1506978004	SD6 2.9M-3.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	7/03/2015	9/03/2015	11/03/2015
HK1506978005	SD6 5.9M-6.9M	25/02/2015	25/02/2015	16:30	ambient	4°C	7/03/2015	9/03/2015	11/03/2015
HK1506978006	SD6 ELUTRIATE BLK	25/02/2015	25/02/2015	16:30	ambient	4°C	7/03/2015	9/03/2015	11/03/2015
HK1507057001	SD8 0M-0.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	10/03/2015	9/03/2015	--
HK1507057002	SD8 0.9M-1.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	10/03/2015	9/03/2015	--
HK1507057003	SD8 1.9M-2.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	10/03/2015	9/03/2015	--
HK1507057004	SD8 2.9M-3.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	10/03/2015	9/03/2015	--
HK1507058001	SD8 0M-0.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	--	9/03/2015	10/03/2015
HK1507058002	SD8 0.9M-1.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	--	9/03/2015	10/03/2015
HK1507058003	SD8 1.9M-2.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	--	9/03/2015	10/03/2015
HK1507058004	SD8 2.9M-3.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	--	9/03/2015	10/03/2015
HK1507060001	SD8 0M-0.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	7/03/2015	9/03/2015	10/03/2015
HK1507060002	SD8 0.9M-1.9M	26/02/2015	26/02/2015	16:15	ambient	4°C	7/03/2015	9/03/2015	10/03/2015

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ALS Lab ID	Client Sample ID	Sampling Date	Receipt Details		Storage Condition*	Testing Date		
			Date	Time		Condition	Metals	Organic	Inorganic
HK1507060003	SD8 1.9M-2.9M	26/02/2015	26/02/2015	16:15	4°C	7/03/2015	9/03/2015	10/03/2015
HK1507060004	SD8 2.9M-3.9M	26/02/2015	26/02/2015	16:15	4°C	7/03/2015	9/03/2015	10/03/2015
HK1507060005	SD8 ELUTRIATE BLK	26/02/2015	26/02/2015	16:15	4°C	7/03/2015	9/03/2015	10/03/2015
HK1507187001	SD7 0M-0.9M	27/02/2015	27/02/2015	15:50	4°C	10/03/2015	9/03/2015	--
HK1507187002	SD7 0.9M-1.9M	27/02/2015	27/02/2015	15:50	4°C	10/03/2015	9/03/2015	--
HK1507187003	SD7 1.9M-2.9M	27/02/2015	27/02/2015	15:50	4°C	10/03/2015	9/03/2015	--
HK1507187004	SD7 2.9M-3.9M	27/02/2015	27/02/2015	15:50	4°C	10/03/2015	9/03/2015	--
HK1507201001	SD7 0M-0.9M	27/02/2015	27/02/2015	15:50	4°C	--	9/03/2015	10/03/2015
HK1507201002	SD7 0.9M-1.9M	27/02/2015	27/02/2015	15:50	4°C	--	9/03/2015	10/03/2015
HK1507201003	SD7 1.9M-2.9M	27/02/2015	27/02/2015	15:50	4°C	--	9/03/2015	10/03/2015
HK1507201004	SD7 2.9M-3.9M	27/02/2015	27/02/2015	15:50	4°C	--	9/03/2015	10/03/2015
HK1507221001	SD7 0M-0.9M	27/02/2015	27/02/2015	15:50	4°C	--	9/03/2015	10/03/2015
HK1507221002	SD7 0.9M-1.9M	27/02/2015	27/02/2015	15:50	4°C	7/03/2015	9/03/2015	11/03/2015
HK1507221003	SD7 1.9M-2.9M	27/02/2015	27/02/2015	15:50	4°C	7/03/2015	9/03/2015	11/03/2015
HK1507221004	SD7 2.9M-3.9M	27/02/2015	27/02/2015	15:50	4°C	7/03/2015	9/03/2015	11/03/2015
HK1507221005	SD7 ELUTRIATE BLK	27/02/2015	27/02/2015	15:50	4°C	7/03/2015	9/03/2015	11/03/2015
HK1509806001	RGS1	20/03/2015	20/03/2015	11:55	4°C	30/03/2015	27/03/2015	--
HK1509808001	RGS1	20/03/2015	20/03/2015	11:55	4°C	--	26/03/2015	27/03/2015
HK1509809001	RGS1	20/03/2015	20/03/2015	11:55	4°C	1/04/2015	30/03/2015	30/03/2015
HK1509809002	RGS1 ELUTRIATE BLK	20/03/2015	20/03/2015	11:55	4°C	1/04/2015	30/03/2015	30/03/2015

Section 4

Chain of Custody (COC) Form

CHAIN OF CUSTODY DOCUMENTATION

H 026597



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: GE/2013/37.01
 SITE: Shy Tau Kok
 P.O. NO.: _____
 QUOTE NO.: _____
 RESULTS REQUIRED (Date): _____
 EMAIL REPORT TO: _____
 EMAIL INVOICE TO: (if different to report) _____

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)
 Notes: e.g. Highly contaminated samples e.g. "High PAHs expected"
 Extra volume for QC or trace LORs etc.

Ammonia	Metals	Chloride	Metals	PAHs	Total PCBs	TBT
TP	Reactive P	Chloride	Metals	PAHs	Total PCBs	TBT
TKN	TP	Chloride	Metals	PAHs	Total PCBs	TBT

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION		RECEIVED BY	METHOD OF SHIPMENT
	MATRIX	DATE	Type / Code	Total bottles		
577	S	2/12	VC100		han	
			0.004 ~ 0.90M		han	
			0.90M ~ 1.90M		han	
			1.90M ~ 2.90M		han	
			2.90M ~ 3.90M		han	
			3.90M ~ 4.90M		han	

RELINQUISHED BY: Conny Wei Date: 27/12/2015
 Name: Conny Wei Of: _____
 Name: Maxwell Mok Of: _____
 Name: _____ Of: _____
 Name: _____ Of: _____

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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric 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.

H 026598

CHAIN OF CUSTODY DOCUMENTATION



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: GE12013137.01
 SITE: Shy Tan Kok P.O. NO.: _____
 QUOTE NO.: _____

SAMPLER: _____
 MOBILE: _____
 PHONE: _____
 EMAIL REPORT TO: _____
 EMAIL INVOICE TO: (if different to report) _____

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

ALS ID	SAMPLE INFORMATION (note: S = Soil, W = Water)		CONTAINER INFORMATION	
	SAMPLE ID	DATE	Type / Code	Total bottles
5177	S	2712	V6100	
			2901 ~ 2907	
			2908 ~ 2911	
			1901 ~ 2907	
			2908 ~ 2911	
			2901 ~ 2907	

RECEIVED BY	RELINQUISHED BY
Name: <u>Wai Keung</u>	Name: <u>Wai Keung</u>
Of: <u>Gannon</u>	Of: <u>Gannon</u>
Name: <u>Maxwell</u>	Name: <u>Maxwell</u>
Of: <u>BV</u>	Of: <u>BV</u>

METHOD OF SHIPMENT
Date: <u>27/2/15</u>
Time: <u>1550</u>
Date: _____
Time: _____

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

Sediment

Handwritten notes in table: Amber glass, W/white, TKLW, Chemical Resistor, W/white, H/Tals, PAHs, total PCBs, TBT

ALS Laboratory Group

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 026596



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: GE/2013/3791
 SITE: Sha Tau Kok
 P.O. NO.: _____
 QUOTE NO.: _____
 RESULTS REQUIRED (Date): _____
 EMAIL REPORT TO: _____
 EMAIL INVOICE TO: (if different to report) _____

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION		REACTIVE P	Chloride Pstic	Leakage	Metals	PAHs	Total PCBs	TBT	Notes: e.g. Highly contaminated samples e.g. "High PAHs expected" Extra volume for QC or trace LORs etc.
	Matrix	Date	Type / Code	Total bottles								
578	S	26/2	VC100									
			2004-0901									
			2901-1901									
			1901-2901									
			2901-3901									

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL: _____

RELINQUISHED BY: Kenney Wai Kenny Date: _____
Harrell Pat Date: _____
 Of: _____

RECEIVED BY: Wai Woy Date: 26/2/15
As Date: 16/5
 Name: _____
 Of: _____
 Name: _____
 Of: _____

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 = Sulphuric 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 026593



ALS Laboratory Group

CLIENT: _____ ADDRESS / OFFICE: _____

PROJECT MANAGER (PM): _____

PROJECT ID: GLE 2013/3101

SITE: Sha Tau Kok P.O. NO.: _____ QUOTE NO.: _____

RESULTS REQUIRED (Date): _____

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate)
 Intact: Yes No N/A

SAMPLE TEMPERATURE _____

CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL: _____

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

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION	
					Type / Code	Total bottles
	<u>SP6</u>	<u>S</u>	<u>2512</u>		<u>VL100</u>	
					<u>0.9017-0.9017</u>	
					<u>0.9017-1.9017</u>	
					<u>1.9017-2.9017</u>	
					<u>2.9017-3.9017</u>	
					<u>5.9017-6.9017</u>	

RELINQUISHED BY: Lenny Wai Lenny Date: 25-2-2015

RECEIVED BY: ALSHK Date: 25/2/2015

RELINQUISHED BY:		RECEIVED BY:		METHOD OF SHIPMENT	
Name:	<u>Lenny Wai</u>	Name:	<u>ALSHK</u>	Con' Note No.:	
Of:	<u>Common</u>	Of:	<u>ALSHK</u>	Date:	<u>25/2/2015</u>
Name:	<u>Maxwell</u>	Name:		Time:	<u>1630</u>
Of:	<u>S V</u>	Of:		Date:	
		Of:		Time:	

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

Sediment

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

Amberic
 Nitrate
 TKAD
 Chloride
 Nitrate

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 026592



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: 761 203137.01
 SITE: Sha Tau Kok
 RESULTS REQUIRED (Date): _____
 P.O. NO.: _____
 QUOTE NO.: _____

EMAIL REPORT TO: _____
 EMAIL INVOICE TO: (if different to report) _____

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

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

Metals
 PAHs
 Total PCBs
 TBT

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	Type / Code	Total bottles
976	S	25/2	VC100	
			2004-09014	
			0904-19014	
			1904-29014	
			2904-39014	
			5904-69014	

RELINQUISHED BY:
 Name: Leung Wai Keung Date: 25/2/2015
 Of: Campan Male Time: _____
 Name: Maxwell Male Date: _____
 Of: BU Time: _____

RECEIVED BY:
 Name: 87 Date: 25/2/2015
 Of: ALSHK Time: 1630
 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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric 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 026591



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: 61212015 37.01
 P.O. NO.: _____
 SITE: Sha Tau Kok
 QUOTE NO.: _____

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

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)			CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	DATE	Type / Code	Total bottles
576	S	25/7	1.9011 1.9011	100	
			0.9011-1.9011		
			1.9011-2.9011		
			2.9011-3.9011		
			3.9011-6.9011		

ANALYSIS REQUIRED INCLUDING SUITE CODES (note - suite codes must be listed to attract suite prices)	RECEIVED BY	RELINQUISHED BY	DATE	TIME	CON' NOTE NO.	METHOD OF SHIPMENT
Ammoniac Nitrate TKN TP Reactive P Chlorinol Residue Nitrate	#3 ALSHK	Lenny Wai Kenny Maxwell Jialc	25/12/2015	1630	25/12/2015	

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

Elutriate Test

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

CHAIN OF CUSTODY DOCUMENTATION

H 026587



ALS Laboratory Group

SAMPLER:
MOBILE:
PHONE:

EMAIL REPORT TO:

EMAIL INVOICE TO: (if different to report)

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

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

CONTAINER INFORMATION

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION	
					Type / Code	Total bottles
	66176	S			Grab	
	66177	S			Grab	
	66178	Soil water Sample W				
	66179	Soil water Sample W				

Metals
PAHs
Total PCBs
TBT

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

Sediment

10 litres

10 litres

10 litres

10 litres

RELINQUISHED BY:

Name: Leung Wan Kung
Of: Channon
Name: MAK MAX W B L L
Of: B L

RECEIVED BY:

Name: Ketsu
Of: ALS HK
Name:
Of:

Date: 10/2/2017
Time:
Date:
Time:

Con' Note No:
Date: 16-Feb-2017
Time: 14:00
Date:
Time:
Transport Co:

METHOD OF SHIPMENT

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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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ALS Laboratory Group

COC Page ___ of ___

CHAIN OF CUSTODY DOCUMENTATION

H 026590



ALS Laboratory Group

CLIENT: _____

ADDRESS / OFFICE: _____

PROJECT MANAGER (PM): _____

PROJECT ID: 6262015137.01

SITE: Spa Tau Koki

RESULTS REQUIRED (Date): _____

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate) N/A

Intact: Yes No N/A

SAMPLE TEMPERATURE _____

CHILLED: Yes No

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

ALS ID 5476 G1B6 5477 G1B7

MATRIX S S

DATE _____

Time _____

CONTAINER INFORMATION

Type / Code Grab Grab

Total bottles _____

RELIQUISHED BY:

Name: Lenny Wah Keng

Of: Giammon

Name: MAK

Of: MAXWELL

Date: 10/2/2015

Time: _____

Date: _____

Time: _____

RECEIVED BY:

Name: Ketsu

Of: ALS HK

Date: 10-Feb-2015

Time: 14:00

Date: _____

Time: _____

Con' Note No: _____

Transport Co: _____

METHOD OF SHIPMENT _____

EMAIL REPORT TO: _____

EMAIL INVOICE TO: (if different to report) _____

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)

Ammonia

TKN

Reactive P

Worried Pite

Nitrate

Elutriate test

10 litres

10 litres

Notes: e.g. Highly contaminated samples

e.g. "High PAHs expected"

Extra volume for QC or trace LORs etc.

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

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COC Page ____ of ____

CHAIN OF CUSTODY DOCUMENTATION

H 026560



ALS Laboratory Group

SAMPLER:
MOBILE:
PHONE

EMAIL REPORT TO:
EMAIL INVOICE TO: (if different to report)

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

ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION	
					Type / Code	Total bottles
SP4	0.0m-0.1m	S				
SP4	0.1m-1.9m	S				
SP4	1.9m-2.9m	S				
SP4	2.9m-3.9m	S				

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

Sediment.

Ammonia
Nitrate
TKN
Chloride
Nitrite

RELINQUISHED BY:
Name: *Lenny Mai Kang*
Of: *Graham*
Name: *MAK*
Of: *BJ*

RECEIVED BY:
Name: *Wan Loon*
Of: *ALS*
Date: *6/2/15*
Time: *1645*

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.

ALS Laboratory Group

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COC Page ___ of ___

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: *14E/2013/137.01*
 SITE: *Sha Tan Kals* P.O. NO.: _____ QUOTE NO.: _____
 RESULTS REQUIRED (Date): _____

EMAIL REPORT TO: _____
 EMAIL INVOICE TO: (if different to report) _____
 ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)
 Notes: e.g. Highly contaminated samples
 e.g. "High PAHs expected"
 Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	Type / Code	Total bottles
<i>SP4</i>	<i>g.intake</i>	<i>S</i>	<i>VC100</i>	
<i>SP4</i>	<i>g.intake</i>	<i>S</i>	<i>7.</i>	
<i>SP4</i>	<i>1.9g to 2.0g</i>	<i>S</i>		
<i>SP4</i>	<i>2.9g to 3.9g</i>	<i>S</i>		
<i>SP4</i>	<i>seawater sample</i>	<i>W</i>		<i>3</i>

RELIQUISHED BY:		RECEIVED BY:	
Name:	Date:	Name:	Date:
<i>Larry Win Keung</i>	<i>6/2/2015</i>	<i>Wan Yung</i>	<i>6/2/15</i>
<i>Gammien</i>		<i>ACS</i>	
<i>MAX MAXWELL</i>			
<i>BV</i>			

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

PHHS
 Total PCBs
 TBT

Sediment

50 litres

RELINQUISHED BY: _____ RECEIVED BY: _____
 Name: _____ Date: _____
 Of: _____ Time: _____
 Name: _____ Date: _____
 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 = Sulphuric 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 026561



ALS Laboratory Group

SAMPLER:
MOBILE:
PHONE

EMAIL REPORT TO:

EMAIL INVOICE TO: (if different to report)

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)

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

Elutriate test

CLIENT:
ADDRESS / OFFICE:
PROJECT MANAGER (PM):
PROJECT ID: *G6/2013/17.01*
SITE: *Sua Tau Koks*
P.O. NO.:
QUOTE NO.:

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION	
SAMPLE ID	MATRIX	Type / Code	Total bottles
<i>S04</i>	<i>0.9m - 0.9m S</i>		
<i>S04</i>	<i>0.9m - 1.9m S</i>		
<i>S04</i>	<i>1.9m - 2.9m S</i>		
<i>S04</i>	<i>2.9m - 3.9m S</i>		

RECEIVED BY:	RELINQUISHED BY:
Name: <i>Lawry Wain Kung</i>	Name: <i>Lawry Wain Kung</i>
Of: <i>Gannon</i>	Of: <i>Gannon</i>
Name: <i>MAK MAXWELL</i>	Name: <i>MAK MAXWELL</i>
Of: <i>BV</i>	Of: <i>BV</i>

RECEIVED BY: *Lawry Wain Kung*
Date: *6/2/2013*
Time:
Name: *Lawry Wain Kung*
Of: *PLS*
Date: *6/2/13*
Time: *1645*
Name:
Of:
Date:
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.

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COC Page ___ of ___

CHAIN OF CUSTODY DOCUMENTATION

H 026575



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: GE/2013/37.01
 P.O. NO.: _____
 SITE: Sha Tau Kok

SAMPLER: _____
 MOBILE: _____
 PHONE: _____
 EMAIL REPORT TO: _____
 EMAIL INVOICE TO: (if different to report) _____

RESULTS REQUIRED (Date): _____ QUOTE NO.: _____

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL: _____

SAMPLE INFORMATION (note: S = Soil, W = Water)			CONTAINER INFORMATION		
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Total bottles
	S/D1 0m-0.9m	S			VC100
	S/D1 0.9m-1.9m	S			VC100
	S/D1 1.9m-2.9m	S			VC100
	S/D1 2.9m-3.9m	S			VC100
	Seawater Sample	W			3

RELINQUISHED BY: _____ RECEIVED BY: _____
 Name: Leung Wai Leung Name: Wai-hong
 Of: Gamma Of: AG
 Name: MAX HAXWELL Name: _____
 Of: PV Of: _____

Date: 5/12/2015 Date: 5/21/15
 Time: _____ Time: 1640
 Date: _____ Date: _____
 Time: _____ 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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric 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.

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

SUITE	REMARKS
Metals	/
PAHs	/
Total PCBs	/
TBT	/
Sediment	/
SOL (3 bottles)	/

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

ALS Laboratory Group

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CHAIN OF CUSTODY DOCUMENTATION

H 026577



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: GEL2013137.01
 P.O. NO.: _____
 SITE: Sha Tau Kok
 RESULTS REQUIRED (Date): _____
 QUOTE NO.: _____

EMAIL INVOICE TO: (if different to report) _____
 EMAIL REPORT TO: _____
 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

SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION	
ALS ID	SAMPLE ID	MATRIX	DATE
	S01 0m-0.9m	S	
	S01 0.9m-1.9m	S	
	S01 1.9m-2.9m	S	
	S01 2.9m-3.9m	S	

RELIQUISHED BY:		RECEIVED BY:	
Name:	Date:	Name:	Date:
<u>Leung Wai Keung</u>	<u>5/2/2015</u>	<u>was boy</u>	<u>5/2/15</u>
Of: <u>Gamma</u>	Time: _____	Of: <u>ASD</u>	Time: <u>1640</u>
Name: <u>MARK HAWWELL</u>	Date: _____	Name: _____	Date: _____
Of: <u>BV</u>	Time: _____	Of: _____	Time: _____

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

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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Specialisation Bottle; SP = Sulphuric 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 026579



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: GE/2013/37.01
 P.O. NO.: _____
 SITE: SAA Tay Kok
 RESULTS REQUIRED (Date): _____
 QUOTE NO.: _____

EMAIL REPORT TO: _____
 EMAIL INVOICE TO: (if different to report) _____

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)

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

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

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	Type / Code	Total bottles
SV	0m-0.9m	S		
SV	0.9m-1.9m	S		
SV	1.9m-2.9m	S		
SV	2.9m-3.9m	S		

Analysis	TKD	Reactive P	Chlorinated Pesticides
Ammonia	/	/	/
	/	/	/
	/	/	/
	/	/	/

RELINQUISHED BY: Lenny Wai Kenny Date: 5/21/2015
 Of: MARK MAXWELL Time: _____
 Name: MARK MAXWELL Date: _____
 Of: RV Time: _____

RECEIVED BY: Wai Wai Date: 5/21/15
 Name: _____ Time: _____
 Of: _____ Date: 16/60
 Name: _____ Time: _____
 Of: _____ Date: _____

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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric 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 026578



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): GE/2013/37.01
 PROJECT ID: Sua Tau Lok P.O. NO.: _____
 SITE: _____ QUOTE NO.: _____

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL: _____
 ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)
 Notes: e.g. Highly contaminated samples
 e.g. "High PAHs expected"
 Extra volume for QC or trace LORs etc.
Elutriate test

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)			CONTAINER INFORMATION		
	SAMPLE ID	MATRIX	DATE	Type / Code	Time	Total bottles
SD1	0.9m-0.9m	S				
SD1	0.9m-1.9m	S				
SD1	1.9m-2.9m	S				
SD1	2.9m-3.9m	S				

RELINQUISHED BY: _____ RECEIVED BY: han hong
 Name: kung wat kung Date: 5/21/2015 Con' Note No:
 Of: Greggman Time: 1640
 Name: MAX MAXWELL Date: _____ Transport Co:
 Of: RV 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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Special Bottle; SP = Sulphuric 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 026567



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: _____
 SITE: Ma Tau Kok P.O. NO.: _____
 RESULTS REQUIRED (Date): _____ QUOTE NO.: _____
 EMAIL REPORT TO: _____
 EMAIL INVOICE TO: (if different to report) _____

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)			CONTAINER INFORMATION		RECEIVED BY	METHOD OF SHIPMENT
	SAMPLE ID	MATRIX	DATE	Time	Type / Code			Total bottles
SD2	0m - 0.9m	S			VC100		
SD2	0.9m - 1.9m	S			7		
SD2	1.9m - 2.9m	S					
SD2	2.9m - 3.9m	S					
SD2	3.9m - 6.1m	S					
SD2	sea water sample w					3 bottles ✓	✓
SD3	sea water sample w					3 bottles ✓	✓

RELINQUISHED BY: _____ RECEIVED BY: Wai Kwong
 Name: Leung Wai Kwong Date: 4/2/15
 Of: Maxwell Time: 10/10
 Name: MAK MAXWELL Date: _____
 Of: Black & Veatch Time: _____

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

CHAIN OF CUSTODY DOCUMENTATION

H 026568



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: _____
 SITE: Stra Tau Koic P.O. NO.: _____
 RESULTS REQUIRED (Date): _____ QUOTE NO.: _____

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)			CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	DATE	Time	Total bottles
	SD2	0.0m - 0.9m	S		
	SD2	0.9m - 1.9m	S		
	SD2	1.9m - 2.9m	S		
	SD2	2.9m - 3.9m	S		
	SD2	3.9m - 6.0m	S		

RELINQUISHED BY: _____
 Name: Lenny Uhai Kanyo Date: 4/2/2015
 Of: Esamon
 Name: MAX MAXWELL
 Of: Black & Veatch

RECEIVED BY: _____
 Name: _____ Date: 4/2/15
 Of: _____ Time: 1710
 Name: _____ Date: _____
 Of: _____ Time: _____

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

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)
Ammonia
Nitrite
TKN
Reactive P
Chloride
TP

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.

CHAIN OF CUSTODY DOCUMENTATION

H 026569



ALS Laboratory Group

CLIENT: _____

ADDRESS / OFFICE: _____

PROJECT MANAGER (PM): _____

PROJECT ID: _____

SITE: Sha Tau Kok

RESULTS REQUIRED (Date): _____

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate)

Intact: Yes No N/A

SAMPLE TEMPERATURE _____

CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL: _____

QUOTE NO.: _____

EMAIL INVOICE TO: (if different to report) _____

EMAIL REPORT TO: _____

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)			CONTAINER INFORMATION		RECEIVED BY	METHOD OF SHIPMENT
	SAMPLE ID	MATRIX	DATE	Time	Type / Code			Total bottles
	<u>SD2</u>	<u>0.9m - 0.9m</u>	<u>S</u>				
	<u>SD2</u>	<u>0.9m - 1.9m</u>	<u>S</u>				
	<u>SD2</u>	<u>1.9m - 2.9m</u>	<u>S</u>				
	<u>SD2</u>	<u>2.9m - 3.9m</u>	<u>S</u>				
	<u>SD2</u>	<u>3.9m - 6.9m</u>	<u>S</u>				

RELINQUISHED BY: Leung Wan Kung Date: 4/2/2015

RECEIVED BY: Wan Kwong Date: 4/2/15

Name: MAK GAMMON Of: ALS

Name: Black & Veatch Of: _____

Con' Note No: _____

Transport Co: _____

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

Elutriate test

PAHs
Total PCBs
TBT
Metals

Water Continer 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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric 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 026570



ALS Laboratory Group

SAMPLER:
MOBILE:
PHONE

EMAIL REPORT TO:

EMAIL INVOICE TO: (if different to report)

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

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

Ammonia
Nitrite
TKN
TO
Reactive P
Chlorinated
Pesticides

e. h. Friate test

CLIENT:
ADDRESS / OFFICE:
PROJECT MANAGER (PM):
PROJECT ID:
SITE: *Sha Tau Kok*
P.O. NO.:
QUOTE NO.:

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

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

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	Type / Code	Total bottles
<i>SD2</i>	<i>0.0m to 0.1m</i>	<i>S</i>		
<i>SD2</i>	<i>0.1m - 1.0m</i>	<i>S</i>		
<i>SD2</i>	<i>1.0m - 2.0m</i>	<i>S</i>		
<i>SD2</i>	<i>2.0m - 3.0m</i>	<i>S</i>		
<i>SD2</i>	<i>3.0m - 6.0m</i>	<i>S</i>		

RELINQUISHED BY:		RECEIVED BY:	
Name:	Date:	Name:	Date:
<i>Lenny Wan Kwong</i>	<i>4/2/2011</i>	<i>Wan Kwong</i>	<i>4/2/15</i>
<i>MAK MAXWELL</i>		<i>ALS</i>	<i>1/10</i>
<i>Black & Veatch</i>			

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = 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 026563



ALS Laboratory Group

CLIENT:		SAMPLER:										
ADDRESS / OFFICE:		MOBILE:										
PROJECT MANAGER (PM):		PHONE:										
PROJECT ID:		EMAIL REPORT TO:										
SITE: <u>Ska Tau Kok</u>		P.O. NO.:										
RESULTS REQUIRED (Date):		QUOTE NO.:										
FOR LABORATORY USE ONLY		ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)										
COOLER SEAL (circle appropriate)		Notes: e.g. Highly contaminated samples										
Intact: Yes No N/A		e.g. "High PAHs expected"										
SAMPLE TEMPERATURE		Extra volume for QC or trace LORs etc.										
CHILLED: Yes No		<u>Sediment</u>										
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:												
SAMPLE INFORMATION (note: S = Soil, W=Water)		RECEIVED BY										
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	Metals	PAHs	Total PCBs	TBT	Con' Note No.	
	S05	0 ^m -0.9 ^m	S		VC100		✓	✓	✓	✓		
	S05	0.9 ^m -1.9 ^m	S		VC100		✓	✓	✓	✓		
	S05	1.9 ^m -2.9 ^m	S		VC100		✓	✓	✓	✓		
	S05	2.9 ^m -3.9 ^m	S		VC100		✓	✓	✓	✓		
	Seawater Sample	W				1	✓	✓	✓	✓	50L (3 bottles)	
RELINQUISHED BY:							METHOD OF SHIPMENT					
Name:	<u>Henry Sui Kang</u>	Date:	<u>3/2/15</u>	Name:	<u>Wan Yung</u>	Date:	<u>3/2/15</u>	Con' Note No.:				
Of:	<u>Granich</u>	Time:		Of:	<u>ALS</u>	Time:		Transport Co.:				
Name:	<u>MAK MAXWELL</u>	Date:		Name:		Date:						
Of:	<u>Black & Veatch</u>	Time:		Of:		Time:						

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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 = Sulphuric 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 026564



ALS Laboratory Group

CLIENT:
 ADDRESS / OFFICE:
 PROJECT MANAGER (PM):
 PROJECT ID:

SITE: *Sila Tan Kak* P.O. NO.:
 QUOTE NO.:

RESULTS REQUIRED (Date):
 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

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

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)			CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	DATE	Type / Code	Total bottles
<i>S05</i>	<i>0.9m - 0.9m</i>	<i>S</i>		<i>Reactive P</i>	<i>✓</i>
<i>S05</i>	<i>0.9m - 1.9m</i>	<i>S</i>		<i>TKN</i>	<i>✓</i>
<i>S05</i>	<i>1.9m - 2.9m</i>	<i>S</i>		<i>Nitrite</i>	<i>✓</i>
<i>S05</i>	<i>2.9m - 3.9m</i>	<i>S</i>		<i>Ammonia</i>	<i>✓</i>

RELINQUISHED BY:
 Name: *Jenny Wai Kang* Date: *3/2/2015*
 Of: *Sammen* Time:
 Name: **MAK MAXWELL** Date:
 Of: *Black & Veatch* Time:

RECEIVED BY:
 Name: *Wang Hoop* Date: *3/2/15*
 Of: *ALS* 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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass;
 Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION H 026565



CLIENT: _____

ADDRESS / OFFICE: _____

PROJECT MANAGER (PM): _____

PROJECT ID: _____

SITE: Sha Tau Kaki P.O. NO.: _____

EMAIL INVOICE TO: (if different to report) _____

EMAIL REPORT TO: _____

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)			CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	DATE	Type / Code	Total bottles
	S05	0 ^m - 0.9 ^m	S	✓	✓
	S05	0.9 ^m - 1.9 ^m	S	✓	✓
	S05	1.9 ^m - 2.9 ^m	S	✓	✓
	S05	2.9 ^m - 3.9 ^m	S	✓	✓

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate) Intact: Yes No N/A

SAMPLE TEMPERATURE _____

CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL: Metals PAHs Total PCBs TBT

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

RECEIVED BY: Wai Kwong ALS

RELINQUISHED BY: _____

Name: Leung Wai Kwong Date: 3/2/15

Of: GRAVIMON Time: 0700

Name: MAK MAXWELL Date: _____

Of: Black & Veatch Time: _____

Con' Note No: _____

Transport Co: _____

METHOD OF SHIPMENT _____

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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric 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.

H 026566

CHAIN OF CUSTODY DOCUMENTATION



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: _____
 SITE: Shi Tau Kok P.O. NO.: _____
 QUOTE NO.: _____
 RESULTS REQUIRED (Date): _____
 ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	Type / Code	Total bottles
	S05 0 ^m - 0.9 ^m	S		
	S05 0.9 ^m - 1.9 ^m	S		
	S05 1.9 ^m - 2.9 ^m	S		
	S05 2.9 ^m - 3.9 ^m	S		

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:
Chlorinated Pesticides
Reactive P
TKN
Nitrite
Ammonia

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

RECEIVED BY: _____
 RELINQUISHED BY: _____
 Name: _____ Date: 3/2/2015
 Of: _____ Time: _____
 Name: MAK SAXWELL Date: _____
 Of: Black & Veatch 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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric 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 026580



ALS Laboratory Group

SAMPLER:
MOBILE:
PHONE:
EMAIL REPORT TO:

EMAIL INVOICE TO: (if different to report)

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)

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

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate)

Intact: Yes No N/A

SAMPLE TEMPERATURE

CHILLED: Yes No

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

SAMPLE ID

MATRIX

DATE

Time

CONTAINER INFORMATION

Type / Code

Total bottles

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
	SP3 0.1m-0.9m	S				
	SP3 0.9m-1.9m	S				
	SP3 1.9m-2.9m	S				
	SP3 2.9m-3.9m	S				
	SP3 3.9m-6.9m	S				
	SP3 6.9m-9.9m	S				

Metals
PAHs
Total PCBs
TBT

Sediment

RELINQUISHED BY:

Name: Leung Wai Keung
Of: Gamma
Name: MAK MAXWELL
Of: RJ

RECEIVED BY:

Name: (signature)
Of: (signature)

Date: 2/2/2015

Time:

Date: 2/2/15

Time: 1715

Con' Note No:

Transport Co:

METHOD OF SHIPMENT

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 Soli; B = Unpreserved Bag.

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COC Page ___ of ___

CHAIN OF CUSTODY DOCUMENTATION

H 026584



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: GE2013137.01
 SITE: Spu Tau Kot P.O. NO.: _____ QUOTE NO.: _____
 RESULTS REQUIRED (Date): _____
 EMAIL REPORT TO: _____
 EMAIL INVOICE TO: (if different to report)

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

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

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)			CONTAINER INFORMATION	
	SAMPLE ID	MATRIX	DATE	Time	Type / Code
GB1	S				Grab
GB2	S				Grab
GB4	S				Grab
GB5	S				Grab
GB1	W				bottle
GB2	W				bottle
GB4	W				bottle
GB5	W				bottle

PAHs	TCOF PCBs	TBT																		
------	-----------	-----	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

RELINQUISHED BY:
 Name: Lenny Wai King Date: 2-2-2015
 Of: Mak Gagnon Time: _____
 Name: Mak Maxwell Date: _____
 Of: BV Time: _____

RECEIVED BY:
 Name: Wai King Date: 2/2/15
 Of: AGJ Time: 1715
 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/Cu Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved;
 V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; SG = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric 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 026576



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: 6E/2014/37.01
 SITE: SAG Tau P.O. NO.: kok
 RESULTS REQUIRED (Date): _____ QUOTE NO.: _____

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

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION	
	MATRIX	DATE	Type / Code	Total bottles
G31	S		Grab	1 bag
G32	S		Grab	1 bag
G34	S		Grab	1 bag
G35	S		Grab	1 bag

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:
 Ammonia
 TP
 Ractive P
 Chlorinated hydrocarbons

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)
 Notes: e.g. Highly contaminated samples
 e.g. "High PAHs expected"
 Extra volume for QC or trace LORs etc.
Sediment

RELINQUISHED BY:		RECEIVED BY:	
Name:	Date:	Name:	Date:
<u>Leung Wai Leung</u>	<u>2-2-2015</u>	<u>Wai Leung</u>	<u>2/2/15</u>
<u>Yak Yung</u>		<u>ALS</u>	<u>1/15</u>

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.

CHAIN OF CUSTODY DOCUMENTATION

H 026582



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: _____
 SITE: _____
 P.O. NO.: _____
 QUOTE NO.: _____

RESULTS REQUIRED (Date): _____
 COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL: _____
 FOR LABORATORY USE ONLY:
 COOLER SEAL (circle appropriate) _____
 Intact: Yes No N/A
 SAMPLE TEMPERATURE _____
 CHILLED: Yes No

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)		CONTAINER INFORMATION		Total bottles
	SAMPLE ID	MATRIX	DATE	Time	
	SPS 0m-0.9m	S			
	SPS 0.9m-1.9m	S			
	SPS 1.9m-2.9m	S			
	SPS 2.9m-3.9m	S			
	SPS 3.9m-6.9m	S			
	SPS 6.9m-9.9m	S			

RELINQUISHED BY: Leiny vai Kwong Date: 21/2/2015
 Name: _____ Of: _____
 Name: HAK MAXWELL Date: _____
 Of: BV Time: _____

RECEIVED BY: Wai Wong Date: 26/2/15
 Name: _____ Of: _____
 Name: _____ Date: _____
 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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric 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.

ANALYSIS REQUIRED INCLUDING SUITES (note - suite codes must be listed to attract suite prices)
 Notes: e.g. Highly contaminated samples
 e.g. "High PAHs expected"
 Extra volume for QC or trace LORs etc.
Metals
Total PCB
TBT
Elutriate Test

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CHAIN OF CUSTODY DOCUMENTATION

H 026583



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SAMPLER:

MOBILE:

PHONE:

EMAIL REPORT TO:

EMAIL INVOICE TO: (if different to report)

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 DISPOSAL:

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

Total bottles

Type / Code

Time

DATE

MATRIX

SAMPLE ID

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles
SP3	0m-0.9m	S				
SP3	0.9m-1.9m	S				
SP3	1.9m-2.9m	S				
SP3	2.9m-3.9m	S				
SP3	3.9m-6.9m	S				
SP3	6.9m-9.9m	S				

Ammonia
TKD
TKD
Reactive P
Chloride/Residue

Elutriate Test

RELINQUISHED BY:

RECEIVED BY:

Name: _____ Date: _____

Of: _____ Time: _____

Name: _____ Date: _____

Of: _____ Time: _____

Name: _____ Date: _____

Of: _____ Time: _____

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 = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass;

Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soil; B = Unpreserved Bag.

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CHAIN OF CUSTODY DOCUMENTATION

H 026586



ALS Laboratory Group

CLIENT: _____
 ADDRESS / OFFICE: _____
 PROJECT MANAGER (PM): _____
 PROJECT ID: GE12013/37.01
 SITE: Shu Tau Kok P.O. NO.: _____
 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 DISPOSAL:
 Notes: e.g. Highly contaminated samples
 e.g. "High PAHs expected"
 Extra volume for QC or trace LORs etc.
Elutriate Test

ALS ID	SAMPLE INFORMATION (note: S = Soil, W=Water)			CONTAINER INFORMATION		RECEIVED BY	METHOD OF SHIPMENT
	SAMPLE ID	MATRIX	DATE	Time	Type / Code			Total bottles
G7B1	S				Grab	1 bag	Amber Glass Nitrate TP Reverse P Chloride Residues
G7B2	S				Grab	1 bag	
G7B4	S				Grab	1 bag	
G7B5	S				Grab	1 bag	

RELINQUISHED BY: Leung Wai Kung Date: _____
 Of: MAC HAYWELL Time: _____
 Name: _____
 Of: _____
 Name: Wai Kung Date: 2/2/15
 Of: ALS Time: 17:15
 Name: _____ Date: _____
 Of: _____ Time: _____

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

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CHAIN OF CUSTODY DOCUMENTATION

H 026558



ALS Laboratory Group

CLIENT: _____ ADDRESS / OFFICE: _____

PROJECT MANAGER (PM): KK 10 G

PROJECT ID: GE 203737.0

SITE: Shea Tan Kok P.O. NO.: _____ QUOTE NO.: _____

RESULTS REQUIRED (Date): _____

SAMPLER: SC100

MOBILE: _____

PHONE: 9864 7640

EMAIL REPORT TO: _____

EMAIL INVOICE TO: (if different to report) _____

FOR LABORATORY USE ONLY		COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL				
Intact:	Yes	No	N/A			
SAMPLE TEMPERATURE						
CHILLED:	Yes	No				
ALS ID	SAMPLE ID	MATRIX	DATE	Time	CONTAINER INFORMATION	Total bottles
	<u>SP3 3.90-4.90</u>					
	<u>4.90-5.90</u>					
	<u>6.90-7.90</u>					
	<u>7.90-8.90</u>					
	<u>9.90-10.90</u>					
	<u>10.90-11.90</u>					
FOR STORAGE						

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

RELINQUISHED BY: Leung Wai Keung Date: _____ Time: _____

Of: Maxwell Wong Date: _____ Time: _____

RECEIVED BY: han hong Date: 2/2/15 Time: 17:05

Of: ALS Date: _____ 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/Cd 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.