

Appendix 9.1a - Onsite Sediment Quality Testing Results

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Sediment Quality Report

Project: AGREEMENT NO CE65\_2006 (DS) PORT SHELTER SEWERAGE STAGE 2 AND STAGE 3 - DESIGN AND CONSTRUCTION

Order No.: CONTRACT NO. GE/2014/21.04

Analyte Description	Silver	Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Mercury	Total Polychlorinated biphenyls	Low M.W. PAHs	High M.W. PAHs	Tributyl Tin	Classification		
Unit (In dry Wt basis)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	ug TBT/L			
Reporting Limits	0.1	1	0.2	1	1	1	1	1	0.05	18	550	1700	0.015			
Lower Chemical Exceedance Level (LCEL)	<b>1</b>	<b>12</b>	<b>1.5</b>	<b>80</b>	<b>65</b>	<b>40</b>	<b>75</b>	<b>200</b>	<b>0.5</b>	<b>23</b>	<b>550</b>	<b>1700</b>	<b>0.15</b>			
Upper Chemical Exceedance Level (UCEL)	<b><u>2</u></b>	<b><u>42</u></b>	<b><u>4</u></b>	<b><u>160</u></b>	<b><u>110</u></b>	<b><u>40</u></b>	<b><u>110</u></b>	<b><u>270</u></b>	<b><u>1</u></b>	<b><u>180</u></b>	<b><u>3160</u></b>	<b><u>9600</u></b>	<b><u>0.15</u></b>			
10 x (LCEL)	<b><u>10</u></b>	<b><u>120</u></b>	<b><u>15</u></b>	<b><u>800</u></b>	<b><u>650</u></b>	<b><u>400</u></b>	<b><u>750</u></b>	<b><u>2000</u></b>	<b><u>5</u></b>	<b><u>230</u></b>	<b><u>5500</u></b>	<b><u>17000</u></b>	<b><u>1.5</u></b>			
Drillhole: SD1																
ALS Lab ID	Sample ID	Sampling Date	<0.1	7	<0.2	20	8	13	20	42	<0.05	<18	<550	<1700	IS	L
HK1513928001	SD1 0.00M-0.90M	25/04/2015	<0.1	5	<0.2	17	4	11	12	33	<0.05	<18	<550	<1700	IS	L
HK1513928002	SD1 0.90M-1.90M	25/04/2015	<0.1	5	<0.2	13	3	8	11	25	<0.05	<18	<550	<1700	IS	L
HK1513928003	SD1 1.90M-2.90M	25/04/2015	<0.1	3	<0.2	4	<1	3	4	8	<0.05	<18	<550	<1700	IS	L
HK1513928004	SD1 2.90M-3.90M	25/04/2015	<0.1	4	<0.2	16	4	10	12	30	<0.05	<18	<550	<1700	IS	L
Drillhole: SD2																
ALS Lab ID	Sample ID	Sampling Date	<0.1	5	<0.2	17	5	11	14	32	<0.05	<18	<550	<1700	IS	L
HK1513902001	SD2 0.00M-0.90M	24/04/2015	<0.1	6	<0.2	17	4	11	12	31	<0.05	<18	<550	<1700	IS	L
HK1513902002	SD2 0.90M-1.90M	24/04/2015	<0.1	4	<0.2	4	<1	3	4	8	<0.05	<18	<550	<1700	IS	L
HK1513902003	SD2 1.90M-2.90M	24/04/2015	<0.1	4	<0.2	4	<1	3	4	8	<0.05	<18	<550	<1700	IS	L
HK1513902004	SD2 2.90M-3.90M	24/04/2015	<0.1	4	<0.2	4	<1	3	4	8	<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)

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	24456
Date of Issue:	2016-02-25
Date Received:	2016-02-19
Date Tested:	2016-02-19
Date Completed:	2016-02-25

**ATTN:** Ms. Betty Choi

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**Sample Description :** 1 sample as received by customer said to be sediment

**Project No. :** IA13070

**Project Name :** Agreement No. CE 41/2013 (EP) Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O, Environmental Impact Assessment Studies – Investigation

**Sampling Date :** 2016-02-19

**Test Requested & Methodology:**

Item	Parameters	Ref. Method	Limit of Reporting
1	Cadmium (Cd)	In-house method SOP053 (ICP-AES) & In-house method SOP093 (digestion) (ICP-MS)	0.05 mg/kg
2	Chromium (Cr)		0.1 mg/kg
3	Copper (Cu)		0.2 mg/kg
4	Mercury (Hg)		0.05 mg/kg
5	Nickel (Ni)		0.2 mg/kg
6	Lead (Pb)		0.1 mg/kg
7	Silver (Ag)		0.1 mg/kg
8	Zinc (Zn)		0.2 mg/kg
9	Arsenic (As)		0.1 mg/kg

**Results:**

Sample ID	Po Toi O
Sample Number	24456-1
Cadmium (mg/kg)	<0.05
Chromium (mg/kg)	17
Copper (mg/kg)	13
Mercury (mg/kg)	<0.05
Nickel (mg/kg)	11
Lead (mg/kg)	23
Silver (mg/kg)	<0.1
Zinc (mg/kg)	51
Arsenic (mg/kg)	3.7

Remark: < = less than

\*\*\*\*\*END OF REPORT\*\*\*\*\*

**PREPARED AND CHECKED BY:**

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
 Laboratory Manager

**TEST REPORT**

**APPLICANT:** Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	24456A
Date of Issue:	2016-02-25
Date Received:	2016-02-19
Date Tested:	2016-02-19
Date Completed:	2016-02-25

**ATTN:** Ms. Betty Choi

Page: 1 of 1

**Sample Description :** 1 sample as received by customer said to be sediment

Project No. : IA13070

Project Name : Agreement No. CE 41/2013 (EP) Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O, Environmental Impact Assessment Studies – Investigation

Sampling Date : 2016-02-19

**Test Requested & Methodology:**

Item	Parameters	Ref. Method	Limit of Reporting
1	Acenaphtene	In-house method SOP090 (GC/MSD)	10 µg/kg
2	Acenaphtylene		10 µg/kg
3	Anthracene		10 µg/kg
4	Fluorene		10 µg/kg
5	Naphthalene		10 µg/kg
6	Phenanthrene		10 µg/kg

**Results:**

Sample ID	Po Toi O
Sample Number	24456-1
Acenaphtene, µg/kg	<10
Acenaphtylene, µg/kg	<10
Anthracene, µg/kg	<10
Fluorene, µg/kg	<10
Naphthalene, µg/kg	<10
Phenanthrene, µg/kg	<10

Remarks: 1) <= less than  
2) Results reported as dry weight basis

\*\*\*\*\*END OF REPORT\*\*\*\*\*

*PREPARED AND CHECKED BY:*

For and On Behalf of **WELLAB Ltd.**

  
\_\_\_\_\_  
**PATRICK TSE**  
Laboratory Manager

**TEST REPORT**

**APPLICANT:** Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	24456B
Date of Issue:	2016-02-25
Date Received:	2016-02-19
Date Tested:	2016-02-19
Date Completed:	2016-02-25

**ATTN:** Ms. Betty Choi

Page: 1 of 2

**Sample Description :** 1 sample as received by customer said to be sediment

**Project No. :** IA13070

**Project Name :** Agreement No. CE 41/2013 (EP) Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O, Environmental Impact Assessment Studies – Investigation

**Sampling Date :** 2016-02-19

**Test Requested & Methodology:**

Item	Parameters	Ref. Method	Limit of Reporting
1	Benzo(a)anthracene	In-house method SOP090 (GC/MSD)	10 µg/kg
2	Benzo(a)pyrene		10 µg/kg
3	Benzo(b)fluoranthene		10 µg/kg
4	Benzo(k)fluoranthene		10 µg/kg
5	Benzo(ghi)perylene		10 µg/kg
6	Chrysene		10 µg/kg
7	Dibenz(ah)anthracene		10 µg/kg
8	Fluoranthene		10 µg/kg
9	Indeno(1,2,3-cd)pyrene		10 µg/kg
10	Pyrene		10 µg/kg

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*PREPARED AND CHECKED BY:*  
For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
Laboratory Manager

## TEST REPORT

Laboratory No.:	24456B
Date of Issue:	2016-02-25
Date Received:	2016-02-19
Date Tested:	2016-02-19
Date Completed:	2016-02-25

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**Results:**

Sample ID	Po Toi O
Sample Number	24456-1
Benzo(a)anthracene (µg/kg)	<10
Benzo(a)pyrene (µg/kg)	<10
Benzo(b)fluoranthene (µg/kg)	<10
Benzo(k)fluoranthene (µg/kg)	<10
Benzo(ghi)perylene (µg/kg)	<10
Chrysene (µg/kg)	<10
Dibenz(ah)anthracene (µg/kg)	<10
Fluoranthene (µg/kg)	<10
Indeno(1,2,3-cd)pyrene (µg/kg)	<10
Pyrene (µg/kg)	<10

Remarks: 1) <= less than  
2) Results reported as dry weight basis

\*\*\*\*\*END OF REPORT\*\*\*\*\*

**TEST REPORT**

**APPLICANT:** Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	24456C
Date of Issue:	2016-02-25
Date Received:	2016-02-19
Date Tested:	2016-02-19
Date Completed:	2016-02-25

**ATTN:** Ms. Betty Choi

Page: 1 of 2

**Sample Description :** 1 sample as received by customer said to be sediment  
**Project No. :** IA13070  
**Project Name :** Agreement No. CE 41/2013 (EP) Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O, Environmental Impact Assessment Studies – Investigation  
**Sampling Date :** 2016-02-19

**Test Requested & Methodology:**

Item	Parameters	Ref. Method	Limit of Reporting
1	2,4'-Dichlorobiphenyl PCB8	In-house method SOP088 (GC/MSD)	2 µg/kg
2	2,2',5'-Trichlorobiphenyl PCB18		2 µg/kg
3	2,4,4'-Trichlorobiphenyl PCB28		2 µg/kg
4	2,2', 3,5'-Tetrachlorobiphenyl PCB44		2 µg/kg
5	2,2', 5,5'-Tetrachlorobiphenyl PCB52		2 µg/kg
6	2,3', 4,4'-Tetrachlorobiphenyl PCB66		2 µg/kg
7	3,3', 4,4'-Tetrachlorobiphenyl PCB 77		2 µg/kg
8	2,2', 4,5,5'-Pentachlorobiphenyl PCB101		2 µg/kg
9	2,3,3', 4,4'-Pentachlorobiphenyl PCB105		2 µg/kg
10	2,3', 4,4',5'-Pentachlorobiphenyl PCB118		2 µg/kg
11	3,3', 4,4',5'-Pentachlorobiphenyl PCB126		2 µg/kg
12	2,2', 3,3',4,4'-Hexachlorobiphenyl PCB128		2 µg/kg
13	2,2', 3,4,4',5'-Hexachlorobiphenyl PCB138		2 µg/kg
14	2,2', 4,4',5,5'-Hexachlorobiphenyl PCB153		2 µg/kg
15	3,3', 4,4',5,5'-Hexachlorobiphenyl PCB169		2 µg/kg
16	2,2', 3,3',4,4',5'-Heptachlorobiphenyl PCB170		2 µg/kg
17	2,2', 3,4,4',5,5'-Heptachlorobiphenyl PCB180		2 µg/kg
18	2,2', 3,4',5,5',6-Heptachlorobiphenyl PCB187		2 µg/kg
19	Total PCBs	Sum of item 1-18	7.2 µg/kg <sup>(1)</sup>

Remark: 1) Total PCBs were calculated by summation of item 1 to 18 results, method detection limits were used when values were below reporting limits

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PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**

  
**PATRICK TSE**  
 Laboratory Manager

## TEST REPORT

Laboratory No.:	24456C
Date of Issue:	2016-02-25
Date Received:	2016-02-19
Date Tested:	2016-02-19
Date Completed:	2016-02-25

Page: 2 of 2

### Results:

Sample ID	Po Toi O
Sample Number	24456-1
2,4'-Dichlorobiphenyl (µg/kg)	<2
2,2',5-Trichlorobiphenyl (µg/kg)	<2
2,4,4'-Trichlorobiphenyl (µg/kg)	<2
2,2', 3,5'-Tetrachlorobiphenyl (µg/kg)	<2
2,2', 5,5'-Tetrachlorobiphenyl (µg/kg)	<2
2,3', 4,4'-Tetrachlorobiphenyl (µg/kg)	<2
3,3', 4,4'-Tetrachlorobiphenyl (µg/kg)	<2
2,2', 4,5,5'-Pentachlorobiphenyl (µg/kg)	<2
2,3,3', 4,4'-Pentachlorobiphenyl (µg/kg)	<2
2,3', 4,4',5-Pentachlorobiphenyl (µg/kg)	<2
3,3', 4,4',5-Pentachlorobiphenyl (µg/kg)	<2
2,2', 3,3',4,4'-Hexachlorobiphenyl (µg/kg)	<2
2,2', 3,4,4',5'-Hexachlorobiphenyl (µg/kg)	<2
2,2', 4,4',5,5'-Hexachlorobiphenyl (µg/kg)	<2
3,3', 4,4',5,5'-Hexachlorobiphenyl (µg/kg)	<2
2,2', 3,3',4,4',5-Heptachlorobiphenyl (µg/kg)	<2
2,2', 3,4,4',5,5'-Heptachlorobiphenyl (µg/kg)	<2
2,2', 3,4',5,5',6-Heptachlorobiphenyl (µg/kg)	<2
Total PCBs (µg/kg)	<7.2

Remarks: 1) < = less than

2) Results reported as dry weight basis

\*\*\*\*\*END OF REPORT\*\*\*\*\*

## TEST REPORT

**APPLICANT:** Cinotech Consultants Limited  
RM 1710, Technology Park,  
18 On Lai Street,  
Shatin, N.T., Hong Kong

Laboratory No.:	24456D
Date of Issue:	2016-02-25
Date Received:	2016-02-19
Date Tested:	2016-02-19
Date Completed:	2016-02-25

**ATTN:** Ms. Betty Choi

Page: 1 of 1

**Sample Description :** 1 sample as received by customer said to be sediment and were prepared for 1 interstitial water sample

**Project No. :** IA13070

**Project Name :** Agreement No. CE 41/2013 (EP) Port Shelter Sewerage, Stage 3 – Sewerage Works at Po Toi O, Environmental Impact Assessment Studies – Investigation

**Sampling Date :** 2016-02-19

### Test Requested & Methodology:

Item	Parameters	Ref. Method	Limit of Reporting
1	Tributyltin	In-house method SOP065 (GC/FPD)	0.01 µg/L

### Results:

Sample ID	Po Toi O
Sample Number	24456-1
Tributyltin (µg/L)	<0.01

Remark: < = less than

\*\*\*\*\*END OF REPORT\*\*\*\*\*

PREPARED AND CHECKED BY:

For and On Behalf of **WELLAB Ltd.**

  
PATRICK TSE  
Laboratory Manager