



Certificate of Analysis

Certificate Number 19-06737

18-Apr-19

Client Earth Science Partnership
33 Cardiff Road
Taffs Well
Cardiff
CF15 7RB

Our Reference 19-06737

Client Reference 7061B

Order No (not supplied)

Contract Title Cosmeston

Description 13 Water samples.

Date Received 11-Apr-19

Date Started 11-Apr-19

Date Completed 18-Apr-19

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By



Adam Fenwick
Contracts Manager





Summary of Chemical Analysis

Water Samples

Our Ref 19-06737

Client Ref 7061B

Contract Title Cosmeston

Lab No	1486844	1486845	1486846	1486847	1486848	1486849	1486850
Sample ID	BH1	BH2	BH3	BH6 D	BH7 D	BH8 S	BH8 D
Depth	4.00	2.50	4.00	12.00	5.00	10.00	10.00
Other ID							
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19
Sampling Time	1100	1115	1130	1145	1145	1200	1230

Test	Method	LOD	Units							
Metals										
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.59	0.87	0.55	0.79	0.73	1.6	0.58
Barium, Dissolved	DETSC 2306	0.26	ug/l	93	74	99	22	41	390	170
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	43	43	52	180	420	320	300
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	0.04	0.12	0.10	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	0.69	0.28
Copper, Dissolved	DETSC 2306	0.4	ug/l	3.1	8.0	1.6	1.4	1.2	< 0.4	3.4
Iron, Total	DETSC 2306*	5.5	ug/l	17000	27000	11000	100000	93000	79000	69000
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.26	< 0.09	< 0.09	< 0.09	< 0.09	0.11	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	1.1	2.5	1.8	8.8	5.8	10	3.4
Selenium, Dissolved	DETSC 2306	0.25	ug/l	2.6	1.2	< 0.25	6.6	0.42	< 0.25	< 0.25
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	1.8	2.4	1.9	2.9	3.0	1.7	1.7
Zinc, Dissolved	DETSC 2306	1.3	ug/l	7.0	3.2	2.6	18	4.6	5.5	46
Inorganics										
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Phenol - Monohydric	DETSC 2131	1.5	ug/l	1.8	< 1.5	< 1.5	< 1.5	< 1.5	1.7	< 1.5
Hardness	DETSC 2303	0.1	mg/l	335	307	321	1380	630	726	695
Petroleum Hydrocarbons										
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Water Samples

Our Ref 19-06737

Client Ref 7061B

Contract Title Cosmeston

Lab No	1486844	1486845	1486846	1486847	1486848	1486849	1486850
Sample ID	BH1	BH2	BH3	BH6 D	BH7 D	BH8 S	BH8 D
Depth	4.00	2.50	4.00	12.00	5.00	10.00	10.00
Other ID							
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19
Sampling Time	1100	1115	1130	1145	1145	1200	1230

Test	Method	LOD	Units							
PAHs										
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	2.0	0.17
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.12	< 0.01
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.01	0.02	< 0.01	< 0.01	0.24	0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.53	0.05
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.13	< 0.05
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.03	0.07	< 0.01	0.02	0.15	0.02
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	3.3	0.33

Summary of Chemical Analysis

Water Samples

Our Ref 19-06737

Client Ref 7061B

Contract Title Cosmeston

Lab No	1486851	1486852	1486853	1486854	1486855	1486856
Sample ID	BH9 D	BH10 S	BH10 D	BH11	BH12	BH13
Depth	10.00	6.00	8.00	6.00	4.00	10.00
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19
Sampling Time	1245	1300	1300	1400	1430	1500

Test	Method	LOD	Units						
Metals									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	4.0	0.55	0.34	0.33	0.50	0.41
Barium, Dissolved	DETSC 2306	0.26	ug/l	130	190	150	73	27	120
Beryllium, Dissolved	DETSC 2306*	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Boron, Dissolved	DETSC 2306*	12	ug/l	410	180	200	21	36	63
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	0.05	< 0.03	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	49	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.3	< 0.4	2.1	2.8	4.6	1.8
Iron, Total	DETSC 2306*	5.5	ug/l	120000	79000	3000	79000	10000	23000
Lead, Dissolved	DETSC 2306	0.09	ug/l	1.0	< 0.09	0.10	< 0.09	< 0.09	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	25	2.5	3.5	2.8	1.7	1.1
Selenium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25	< 0.25	0.59	< 0.25
Vanadium, Dissolved	DETSC 2306	0.6	ug/l	2.4	1.7	1.9	1.4	1.2	1.1
Zinc, Dissolved	DETSC 2306	1.3	ug/l	650	3.3	29	< 1.3	4.4	24
Inorganics									
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Phenol - Monohydric	DETSC 2131	1.5	ug/l	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Hardness	DETSC 2303	0.1	mg/l	1190	457	410	256	286	372
Petroleum Hydrocarbons									
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Water Samples

Our Ref 19-06737

Client Ref 7061B

Contract Title Cosmeston

Lab No	1486851	1486852	1486853	1486854	1486855	1486856
Sample ID	BH9 D	BH10 S	BH10 D	BH11	BH12	BH13
Depth	10.00	6.00	8.00	6.00	4.00	10.00
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19	08/04/19
Sampling Time	1245	1300	1300	1400	1430	1500

Test	Method	LOD	Units						
PAHs									
Acenaphthene	DETSC 3304	0.01	ug/l	0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	DETSC 3304	0.05	ug/l	0.09	0.14	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	DETSC 3304	0.01	ug/l	0.02	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	0.02	< 0.01	0.02	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	0.28	< 0.20	< 0.20	< 0.20	< 0.20

Information in Support of the Analytical Results

Our Ref 19-06737
 Client Ref 7061B
 Contract Cosmeston

Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
1486844	BH1 4.00 WATER	08/04/19	PB 1L		Aliphatics/Aromatics, BTEX/PRO, Naphthalene, PAH MS
1486845	BH2 2.50 WATER	08/04/19	GB 1L, PB 1L		
1486846	BH3 4.00 WATER	08/04/19	GB 1L, PB 1L		
1486847	BH6 D 12.00 WATER	08/04/19	PB 1L		Aliphatics/Aromatics, BTEX/PRO, Naphthalene, PAH MS
1486848	BH7 D 5.00 WATER	08/04/19	GB 1L, PB 1L		
1486849	BH8 S 10.00 WATER	08/04/19	GB 1L, PB 1L		
1486850	BH8 D 10.00 WATER	08/04/19	GB 1L, PB 1L		
1486851	BH9 D 10.00 WATER	08/04/19	GB 1L, PB 1L		
1486852	BH10 S 6.00 WATER	08/04/19	GB 1L, PB 1L		
1486853	BH10 D 8.00 WATER	08/04/19	GB 1L, PB 1L		
1486854	BH11 6.00 WATER	08/04/19	GB 1L, PB 1L		
1486855	BH12 4.00 WATER	08/04/19	GB 1L, PB 1L		
1486856	BH13 10.00 WATER	08/04/19	GB 1L, PB 1L		
1486857	BH4 D 1.00 WATER	08/04/19	GB 1L, PB 1L		

Key: P-Plastic B-Bottle G-Glass

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months