Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54	55-57	58-60	LOD/LOR	Units	Method No.
Sample ID	WS-09	WS-10	WS-10	WS-11	WS-12	WS-12	WS-13	WS-13	WS-14	WS-16			
Depth	1.00-1.50	0.00-1.00	1.00-2.00	0.00-0.70	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	0.00-1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	30/08/2019	29/08/2019	29/08/2019	03/09/2019	30/08/2019	30/08/2019	03/09/2019	03/09/2019	28/08/2019	03/09/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
Antimony	1	39	-	20	<1	<1	6	1	<1	46$_{AB}$	<1	mg/kg	TM30/PM15
Arsenic #	6.6	77.1	-	41.2	4.0	4.9	20.5	3.7	1.7	79.5	<0.5	mg/kg	TM30/PM15
Barium #	1560	1705	-	304	79	40	210	42	13	2381	<1	mg/kg	TM30/PM15
Cadmium #	<0.1	33.9	-	16.4	0.4	0.4	0.9	0.5	0.4	18.4	<0.1	mg/kg	TM30/PM15
Chromium #	63.9	30.9	-	32.5	41.8	35.5	73.4	69.2	22.2	60.2	<0.5	mg/kg	TM30/PM15
Copper #	<1	293	-	175	26	23	152	45	11	361$_{AB}$	<1	mg/kg	TM30/PM15
Lead #	48	4709	-	3128$_{AB}$	207	36	382	60	19	4882$_{AB}$	<5	mg/kg	TM30/PM15
Mercury #	<0.1	1.3	-	0.5	<0.1	<0.1	1.0	0.3	<0.1	1.5	<0.1	mg/kg	TM30/PM15
Molybdenum #	2.0	2.2	-	3.0	2.7	1.7	4.5	4.1	2.2	4.1	<0.1	mg/kg	TM30/PM15
Nickel #	5.6	11.0	-	8.6	15.4	11.9	19.9	12.0	7.6	15.4	<0.7	mg/kg	TM30/PM15
Selenium #	6	<1	-	<1	2	2	<1	<1	<1	1	<1	mg/kg	TM30/PM15
Zinc #	82	5015	-	1961	83	38	285	51	183	3042$_{AB}$	<5	mg/kg	TM30/PM15
Antimony	-	-	6	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Arsenic	-	-	12.2	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Barium	-	-	173	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Cadmium	-	-	115.3$_{AC}$	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Chromium	-	-	10.8	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Copper	-	-	111	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Lead	-	-	684	-	-	-	-	-	-	-	<5	mg/kg	TM30/PM62
Mercury	-	-	0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Molybdenum	-	-	2.3	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Nickel	-	-	15.1	-	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM62
Selenium	-	-	2	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Zinc	-	-	10741$_{AC}$	-	-	-	-	-	-	-	<5	mg/kg	TM30/PM62

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54	55-57	58-60	LOD/LOR	Units	Method No.
Sample ID	WS-09	WS-10	WS-10	WS-11	WS-12	WS-12	WS-13	WS-13	WS-14	WS-16			
Depth	1.00-1.50	0.00-1.00	1.00-2.00	0.00-0.70	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	0.00-1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	30/08/2019	29/08/2019	29/08/2019	03/09/2019	30/08/2019	30/08/2019	03/09/2019	03/09/2019	28/08/2019	03/09/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
PAH MS													
Naphthalene #	0.07	0.05	0.04	<0.40 AC	0.11	<0.04	0.79	<0.04	<0.04	0.07	<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.08	0.04	<0.03	<0.30 AC	0.09	<0.03	1.33	<0.03	<0.03	0.08	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.50 AC	<0.05	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.40 AC	<0.04	<0.04	0.27	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.41	0.19	0.13	<0.30 AC	0.42	0.15	3.15	0.05	<0.03	0.21	<0.03	mg/kg	TM4/PM8
Anthracene #	0.14	0.07	0.04	<0.40 AC	0.11	0.06	1.40	<0.04	<0.04	0.10	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.86	0.40	0.20	<0.30 AC	0.66	0.33	8.57	0.05	<0.03	0.59	<0.03	mg/kg	TM4/PM8
Pyrene #	0.80	0.44	0.18	<0.30 AC	0.59	0.28	7.43	<0.03	<0.03	0.51	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.66	0.30	0.17	<0.60 AC	0.50	0.30	8.24	<0.06	<0.06	0.47	<0.06	mg/kg	TM4/PM8
Chrysene #	0.62	0.32	0.15	<0.20 AC	0.50	0.24	6.77	<0.02	<0.02	0.42	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	1.10	0.62	0.29	<0.70 AC	0.93	0.41	16.38	<0.07	<0.07	0.86	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.58	0.36	0.14	<0.40 AC	0.48	0.21	8.72	<0.04	<0.04	0.46	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	0.34	0.24	0.10	<0.40 AC	0.31	0.10	5.83	<0.04	<0.04	0.29	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.09	0.06	<0.04	<0.40 AC	0.09	<0.04	1.33	<0.04	<0.04	0.07	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.37	0.30	0.10	<0.40 AC	0.31	0.12	6.13	<0.04	<0.04	0.30	<0.04	mg/kg	TM4/PM8
Coronene	0.08	0.06	<0.04	<0.40 AC	0.06	<0.04	1.33	<0.04	<0.04	0.07	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	3.25	1.92	0.83	<2.20 AC	2.69	1.17	45.63	<0.22	<0.22	2.50	<0.22	mg/kg	TM4/PM8
PAH 17 Total	6.20	3.45	1.54	<6.40 AC	5.16	2.20	77.78	<0.64	<0.64	4.50	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.79	0.45	0.21	<0.50 AC	0.67	0.30	11.79	<0.05	<0.05	0.62	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.31	0.17	0.08	<0.20 AC	0.26	0.11	4.59	<0.02	<0.02	0.24	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<10 AC	<1	<1	4	<1	<1	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	101	100	101	99 AC	100	95	99	100	101	98	<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	117	<30	201	<30	<30	<30	<30	38	72	<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4	<4	<4	<4	<4	9	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	14	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	90	<7	140	<7	<7	<7	<7	38	49	<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	27	<7	61	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	117	<26	201	<26	<26	<26	<26	38	72	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10	<10	<10	<10	<10	19	<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	91	<10	128	<10	<10	<10	<10	38	46	<10	mg/kg	TM5/PM8/PM16

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Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54	55-57	58-60	LOD/LOR	Units	Method No.
Sample ID	WS-09	WS-10	WS-10	WS-11	WS-12	WS-12	WS-13	WS-13	WS-14	WS-16			
Depth	1.00-1.50	0.00-1.00	1.00-2.00	0.00-0.70	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	0.00-1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	30/08/2019	29/08/2019	29/08/2019	03/09/2019	30/08/2019	30/08/2019	03/09/2019	03/09/2019	28/08/2019	03/09/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4	9	<4	<4	4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7	61	<7	<7	8	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	174	<7	414	<7	<7	363	<7	<7	147	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	44	<7	211	<7	<7	57	<7	<7	49	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	218	<26	625	<26	<26	490	<26	<26	208	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	335	<52	826	<52	<52	490	<52	<52	280	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	19	<10	<10	<10	<10	152	<10	<10	36	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	179	<10	388	<10	<10	265	<10	<10	147	<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5 SV	<5 SV	<5 SV	<5	<5	<5 SV	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene #	<5	<5 SV	<5 SV	<5 SV	<5	<5	<5 SV	<5	<5	<5	<5	ug/kg	TM31/PM12
Toluene #	<5	<5 SV	8 SV	<5 SV	19	<5	<5 SV	<5	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5 SV	<5 SV	<5 SV	<5	<5	<5 SV	<5	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5 SV	<5 SV	<5 SV	<5	<5	<5 SV	<5	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5 SV	<5 SV	<5 SV	<5	<5	<5 SV	<5	<5	<5	<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<175 AB	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8
Natural Moisture Content	31.0	6.2	7.2	6.5	11.5	15.2	27.0	23.5	3.7	11.5	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	23.7	5.8	6.7	6.1	10.3	13.2	21.3	19.0	3.5	10.3	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	63.9	30.9	-	32.5	41.8	35.5	73.4	69.2	22.2	60.2	<0.5	mg/kg	NONE/NONE
Chromium III	-	-	10.8	-	-	-	-	-	-	-	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	1.85	0.67	NDP	1.56	2.16	0.76	8.07	1.51	0.10	0.95	<0.02	%	TM21/PM24
pH #	8.57	8.81	8.68	7.91	8.78	9.18	8.68	8.80	8.44	8.82	<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1299	0.095	0.0964	0.0978	0.1019	0.0991	0.1115	0.1073	0.0935	0.1011		kg	NONE/PM17

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All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

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Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54	55-57	58-60	LOD/LOR	Units	Method No.
Sample ID	WS-09	WS-10	WS-10	WS-11	WS-12	WS-12	WS-13	WS-13	WS-14	WS-16			
Depth	1.00-1.50	0.00-1.00	1.00-2.00	0.00-0.70	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	0.00-1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	30/08/2019	29/08/2019	29/08/2019	03/09/2019	30/08/2019	30/08/2019	03/09/2019	03/09/2019	28/08/2019	03/09/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		kg	NONE/PM17

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Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	61-63	64-66	67-69	70-72	73-75	76-78	79-81	82-84	85-87	88-90	LOD/LOR	Units	Method No.
Sample ID	WS-17	WS-18	WS-18	WS-18	WS-19	WS-19	WS-20	WS-21	WS-21	WS-21			
Depth	0.00-1.00	0.00-1.00	1.00-2.00	2.00-2.80	0.00-1.00	1.00-1.60	0.00-1.00	0.00-1.00	1.00-2.00	2.00-3.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	02/09/2019	02/09/2019	02/09/2019	02/09/2019	03/09/2019	03/09/2019	29/08/2019	29/08/2019	29/08/2019	29/08/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
Antimony	<1	-	-	10	<1	1	1	1	3	1	<1	mg/kg	TM30/PM15
Arsenic #	2.4	-	-	61.9	3.1	3.6	3.5	5.0	7.4	5.4	<0.5	mg/kg	TM30/PM15
Barium #	15	-	-	452	28	76	36	46	165	47	<1	mg/kg	TM30/PM15
Cadmium #	0.3	-	-	9.3	0.7	0.7	0.6	0.4	0.9	1.0	<0.1	mg/kg	TM30/PM15
Chromium #	18.6	-	-	77.0	19.7	77.2	32.1	57.5	79.3	88.6	<0.5	mg/kg	TM30/PM15
Copper #	6	-	-	2146_{AB}	16	37	36	24	46	19	<1	mg/kg	TM30/PM15
Lead #	11	-	-	956	30	47	72	69	395	21	<5	mg/kg	TM30/PM15
Mercury #	<0.1	-	-	0.7	<0.1	<0.1	0.2	<0.1	0.1	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	2.1	-	-	4.9	2.4	3.2	3.4	3.2	4.8	5.2	<0.1	mg/kg	TM30/PM15
Nickel #	7.7	-	-	47.8	9.3	18.1	13.2	12.9	19.7	21.3	<0.7	mg/kg	TM30/PM15
Selenium #	<1	-	-	1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Zinc #	45	-	-	2850_{AB}	49	82	1070	57	275	52	<5	mg/kg	TM30/PM15
Antimony	-	12	17	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Arsenic	-	24.7	14.7	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Barium	-	590	1329	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Cadmium	-	15.5	1.5	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Chromium	-	16.0	19.9	-	-	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Copper	-	142	96	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Lead	-	1976	938	-	-	-	-	-	-	-	<5	mg/kg	TM30/PM62
Mercury	-	0.6	<0.1	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Molybdenum	-	1.2	1.0	-	-	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Nickel	-	13.3	13.7	-	-	-	-	-	-	-	<0.7	mg/kg	TM30/PM62
Selenium	-	<1	2	-	-	-	-	-	-	-	<1	mg/kg	TM30/PM62
Zinc	-	1791	1033	-	-	-	-	-	-	-	<5	mg/kg	TM30/PM62

Please see attached notes for all abbreviations and acronyms

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All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	61-63	64-66	67-69	70-72	73-75	76-78	79-81	82-84	85-87	88-90	LOD/LOR	Units	Method No.
Sample ID	WS-17	WS-18	WS-18	WS-18	WS-19	WS-19	WS-20	WS-21	WS-21	WS-21			
Depth	0.00-1.00	0.00-1.00	1.00-2.00	2.00-2.80	0.00-1.00	1.00-1.60	0.00-1.00	0.00-1.00	1.00-2.00	2.00-3.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	02/09/2019	02/09/2019	02/09/2019	02/09/2019	03/09/2019	03/09/2019	29/08/2019	29/08/2019	29/08/2019	29/08/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
PAH MS													
Naphthalene #	<0.04	0.57	<0.40 AC	1.18 AC	0.24	0.11	<0.04	0.04	0.07	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.89	1.90 AC	0.73 AC	0.08	0.11	<0.03	0.08	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	0.19	<0.50 AC	<0.50 AC	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	0.52	<0.40 AC	<0.40 AC	0.05	0.06	<0.04	0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	3.38	1.05 AC	4.88 AC	0.51	0.91	<0.03	0.58	0.18	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	1.82	1.06 AC	1.34 AC	0.17	0.31	<0.04	0.28	0.06	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	8.00	3.94 AC	7.72 AC	0.91	1.87	0.04	1.12	0.42	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	6.73	5.20 AC	7.01 AC	0.79	1.56	0.03	1.02	0.41	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	4.79	2.34 AC	5.37 AC	0.54	1.01	<0.06	0.81	0.32	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	4.33	4.07 AC	5.68 AC	0.50	0.93	<0.02	0.71	0.30	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	7.95	19.51 AC	9.41 AC	0.98	1.61	<0.07	1.21	0.59	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	4.42	12.70 AC	4.69 AC	0.54	0.88	<0.04	0.66	0.31	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	<0.04	2.88	12.85 AC	3.26 AC	0.39	0.50	<0.04	0.44	0.20	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.53	2.17 AC	0.94 AC	0.09	0.11	<0.04	0.11	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	2.58	13.63 AC	3.32 AC	0.36	0.50	<0.04	0.49	0.20	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	0.50	2.42 AC	0.64 AC	0.08	0.10	<0.04	0.12	0.06	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	25.83	62.63 AC	28.40 AC	3.18	5.36	<0.22	3.92	1.72	<0.22	<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	50.08	82.84 AC	56.17 AC	6.23	10.57	<0.64	7.71	3.12	<0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	5.72	14.05 AC	6.78 AC	0.71	1.16	<0.05	0.87	0.42	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	2.23	5.46 AC	2.63 AC	0.27	0.45	<0.02	0.34	0.17	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	2	<10 AC	<10 AC	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	97	100	97 AC	100 AC	101	96	100	96	92	97	<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	108	191	819 AA	34	<30	<30	<30	<30	<30	<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.6 AA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	7	<4	<12 AA	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	22	<7	58 AA	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	79	153	682 AA	34	19	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	38	79 AA	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	108	191	819 AA	34	<26	<26	<26	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	176 AA	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	68	136	564 AA	34	19	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	61-63	64-66	67-69	70-72	73-75	76-78	79-81	82-84	85-87	88-90	LOD/LOR	Units	Method No.
Sample ID	WS-17	WS-18	WS-18	WS-18	WS-19	WS-19	WS-20	WS-21	WS-21	WS-21			
Depth	0.00-1.00	0.00-1.00	1.00-2.00	2.00-2.80	0.00-1.00	1.00-1.60	0.00-1.00	0.00-1.00	1.00-2.00	2.00-3.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	02/09/2019	02/09/2019	02/09/2019	02/09/2019	03/09/2019	03/09/2019	29/08/2019	29/08/2019	29/08/2019	29/08/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.6 AA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<12 AA	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	18	48	117 AA	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	162	1284	802 AA	152	16	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	38	311	99 AA	46	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	218	1643	1018 AA	198	<26	<26	<26	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	326	1834	1837 AA	232	<52	<52	<52	<52	<52	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1	<0.1 SV	<0.1 SV	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	64	205	317 AA	13	15	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	160	1109	602 AA	134	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5 SV	<5 SV	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene #	<5	<5 SV	<5 SV	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Toluene #	<5	<5 SV	<5 SV	<5 SV	<5 SV	<5	<5	<5	7	<5	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5 SV	<5 SV	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5 SV	<5 SV	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5 SV	<5 SV	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<25 AB	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 #	<5	6	<25 AB	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<25 AB	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<25 AB	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	<5	8	<25 AB	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	<5	9	<25 AB	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	<5	6	<25 AB	<25 AB	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<175 AB	<175 AB	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8
Natural Moisture Content	6.4	10.9	16.5	34.3	9.2	13.4	6.1	12.2	20.1	14.4	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	6.0	9.8	14.2	25.6	8.5	11.8	5.8	10.9	16.7	12.6	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	18.6	-	-	77.0	19.7	77.2	32.1	57.5	79.3	88.6	<0.5	mg/kg	NONE/NONE
Chromium III	-	16.0	19.9	-	-	-	-	-	-	-	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.10	NDP	NDP	20.55	0.44	0.70	0.26	1.09	2.78	0.68	<0.02	%	TM21/PM24
pH #	8.65	8.41	8.71	7.91	10.05	8.59	9.44	9.00	8.58	8.55	<0.01	pH units	TM73/PM11
Mass of raw test portion	0.096	0.1073	0.1068	0.1216	0.0981	0.0989	0.0976	0.1015	0.1164	0.111		kg	NONE/PM17

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	61-63	64-66	67-69	70-72	73-75	76-78	79-81	82-84	85-87	88-90	LOD/LOR	Units	Method No.
Sample ID	WS-17	WS-18	WS-18	WS-18	WS-19	WS-19	WS-20	WS-21	WS-21	WS-21			
Depth	0.00-1.00	0.00-1.00	1.00-2.00	2.00-2.80	0.00-1.00	1.00-1.60	0.00-1.00	0.00-1.00	1.00-2.00	2.00-3.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	02/09/2019	02/09/2019	02/09/2019	02/09/2019	03/09/2019	03/09/2019	29/08/2019	29/08/2019	29/08/2019	29/08/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		kg	NONE/PM17

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Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	91-93	94-96	97-99	100-102	103-105						LOD/LOR	Units	Method No.
Sample ID	WS-21	WS-22	WS-23	WS-23	WS-24								
Depth	3.00-4.00	0.00-1.00	0.00-1.00	1.00-2.00	0.00-0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	29/08/2019	29/08/2019	02/09/2019	02/09/2019	02/09/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019								
Antimony	2	2	2	2	<1						<1	mg/kg	TM30/PM15
Arsenic #	5.3	6.6	5.4	2.7	2.9						<0.5	mg/kg	TM30/PM15
Barium #	65	85	108	87	19						<1	mg/kg	TM30/PM15
Cadmium #	0.8	1.1	3.0	0.3	0.5						<0.1	mg/kg	TM30/PM15
Chromium #	75.1	50.7	71.4	131.9	25.6						<0.5	mg/kg	TM30/PM15
Copper #	21	41	48	47	8						<1	mg/kg	TM30/PM15
Lead #	46	155	264	61	5						<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	0.2	<0.1	<0.1						<0.1	mg/kg	TM30/PM15
Molybdenum #	3.9	2.8	4.1	5.6	3.4						<0.1	mg/kg	TM30/PM15
Nickel #	22.8	10.9	14.0	24.2	12.3						<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1						<1	mg/kg	TM30/PM15
Zinc #	76	192	309	89	13						<5	mg/kg	TM30/PM15
Antimony	-	-	-	-	-						<1	mg/kg	TM30/PM62
Arsenic	-	-	-	-	-						<0.5	mg/kg	TM30/PM62
Barium	-	-	-	-	-						<1	mg/kg	TM30/PM62
Cadmium	-	-	-	-	-						<0.1	mg/kg	TM30/PM62
Chromium	-	-	-	-	-						<0.5	mg/kg	TM30/PM62
Copper	-	-	-	-	-						<1	mg/kg	TM30/PM62
Lead	-	-	-	-	-						<5	mg/kg	TM30/PM62
Mercury	-	-	-	-	-						<0.1	mg/kg	TM30/PM62
Molybdenum	-	-	-	-	-						<0.1	mg/kg	TM30/PM62
Nickel	-	-	-	-	-						<0.7	mg/kg	TM30/PM62
Selenium	-	-	-	-	-						<1	mg/kg	TM30/PM62
Zinc	-	-	-	-	-						<5	mg/kg	TM30/PM62

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	91-93	94-96	97-99	100-102	103-105						LOD/LOR	Units	Method No.
Sample ID	WS-21	WS-22	WS-23	WS-23	WS-24								
Depth	3.00-4.00	0.00-1.00	0.00-1.00	1.00-2.00	0.00-0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	29/08/2019	29/08/2019	02/09/2019	02/09/2019	02/09/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019								
PAH MS													
Naphthalene #	<0.04	0.04	0.10	0.08	<0.04						<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.05	0.05	0.08	<0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	0.06	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.07	0.15	0.32	0.30	<0.03						<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	0.05	0.16	0.14	<0.04						<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.17	0.37	0.61	0.79	<0.03						<0.03	mg/kg	TM4/PM8
Pyrene #	0.17	0.34	0.51	0.72	<0.03						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.14	0.32	0.39	0.56	<0.06						<0.06	mg/kg	TM4/PM8
Chrysene #	0.12	0.26	0.32	0.59	<0.02						<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.24	0.54	0.62	1.00	<0.07						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.12	0.28	0.35	0.54	<0.04						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	0.09	0.20	0.23	0.30	<0.04						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.04	0.04	0.07	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.10	0.22	0.24	0.31	<0.04						<0.04	mg/kg	TM4/PM8
Coronene	<0.04	0.05	0.05	0.08	<0.04						<0.04	mg/kg	TM4/PM8
PAH 6 Total #	0.72	1.61	2.05	2.94	<0.22						<0.22	mg/kg	TM4/PM8
PAH 17 Total	1.22	2.91	4.05	5.56	<0.64						<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.17	0.39	0.45	0.72	<0.05						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.07	0.15	0.17	0.28	<0.02						<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1						<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	86	98	94	97	101						<0	%	TM4/PM8
Mineral Oil (C10-C40)	105	<30	<30	<30	<30						<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	87	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40	18	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	105	<26	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
>C25-C35	75	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	91-93	94-96	97-99	100-102	103-105						LOD/LOR	Units	Method No.
Sample ID	WS-21	WS-22	WS-23	WS-23	WS-24								
Depth	3.00-4.00	0.00-1.00	0.00-1.00	1.00-2.00	0.00-0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	29/08/2019	29/08/2019	02/09/2019	02/09/2019	02/09/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019								
TPH CWG													
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	70	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	70	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	105	70	<52	<52	<52						<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	14	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	58	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	<35						<35	ug/kg	TM17/PM8
Natural Moisture Content	13.4	8.8	8.3	10.4	8.4						<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	11.8	8.1	7.7	9.4	7.8						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/kg	TM38/PM20
Chromium III	75.1	50.7	71.4	131.9	25.6						<0.5	mg/kg	NONE/NONE
Chromium III	-	-	-	-	-						<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.72	0.62	1.51	0.84	0.21						<0.02	%	TM21/PM24
pH #	8.95	8.57	8.35	8.81	10.52						<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1026	0.0988	0.1054	0.1001	0.099							kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	91-93	94-96	97-99	100-102	103-105						LOD/LOR	Units	Method No.
Sample ID	WS-21	WS-22	WS-23	WS-23	WS-24								
Depth	3.00-4.00	0.00-1.00	0.00-1.00	1.00-2.00	0.00-0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	29/08/2019	29/08/2019	02/09/2019	02/09/2019	02/09/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019								
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09							kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

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All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	WS-01	WS-02	WS-03	WS-04	WS-04	WS-04	WS-05	WS-05	WS-07	WS-09			
Depth	0.00-0.50	0.00-0.50	0.00-0.54	0.00-1.00	1.00-2.00	2.00-2.20	0.00-1.00	1.00-1.70	0.00-0.70	0.00-1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	02/09/2019	02/09/2019	02/09/2019	02/09/2019	02/09/2019	02/09/2019	02/09/2019	02/09/2019	30/08/2019	30/08/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
Dissolved Antimony #	0.004	0.003	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	0.0046	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.046	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.110	0.079	0.098	0.003	<0.003	<0.003	0.004	<0.003	0.018	0.035	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	1.10	0.79	0.98	0.03	<0.03	<0.03	0.04	<0.03	0.18	0.35	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.008	<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.08	<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.010	0.009	0.011	0.009	0.005	0.008	0.015	0.006	0.009	0.005	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.10	0.09	0.11	0.09	0.05	0.08	0.15	0.06	0.09	0.05	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	0.006	0.006	0.006	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	0.06	0.06	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	0.003	<0.003	<0.003	0.003	<0.003	<0.003	<0.003	0.005	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00002	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	<0.3	0.5	<0.3	0.8	<0.3	0.4	<0.3	<0.3	<0.3	<0.3	mg/l	TM173/PM0
Fluoride	<3	<3	5	<3	8	<3	4	<3	<3	<3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	12.6	23.1	11.4	1.0	5.4	11.5	12.4	6.6	282.6	9.8	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	126	231	114	10	54	115	124	66	2825	98	<5	mg/kg	TM38/PM0
Chloride #	3.4	0.4	<0.3	<0.3	1.2	24.6	2.2	3.0	4.0	0.8	<0.3	mg/l	TM38/PM0
Chloride #	34	4	<3	<3	12	246	22	30	40	8	<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	3	<2	<2	3	<2	4	3	2	<2	4	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30	<20	<20	30	<20	40	30	<20	<20	40	<20	mg/kg	TM60/PM0
pH	10.28	8.32	8.36	8.48	8.18	8.24	8.16	8.23	7.59	8.30	<0.01	pH units	TM73/PM0
Total Dissolved Solids #	106	87	70	65	81	120	66	76	469	87	<35	mg/l	TM20/PM0
Total Dissolved Solids #	1060	870	700	650	810	1200	660	760	4688	870	<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54	55-57	58-60	LOD/LOR	Units	Method No.
Sample ID	WS-09	WS-10	WS-10	WS-11	WS-12	WS-12	WS-13	WS-13	WS-14	WS-16			
Depth	1.00-1.50	0.00-1.00	1.00-2.00	0.00-0.70	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	0.00-1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	30/08/2019	29/08/2019	29/08/2019	03/09/2019	30/08/2019	30/08/2019	03/09/2019	03/09/2019	28/08/2019	03/09/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
Dissolved Antimony #	<0.002	0.017	<0.002	0.014	0.005	<0.002	0.038	0.006	<0.002	0.021	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	0.17	<0.02	0.14	0.05	<0.02	0.38	0.06	<0.02	0.21	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	0.0222	<0.0025	<0.0025	0.0038	0.0031	0.0163	<0.0025	<0.0025	0.0153	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	0.222	<0.025	<0.025	0.038	0.031	0.163	<0.025	<0.025	0.153	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	0.146	0.073	0.121	<0.003	<0.003	0.010	<0.003	0.016	0.181	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	1.46	0.73	1.21	<0.03	<0.03	0.10	<0.03	0.16	1.81	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	0.0006	0.0477	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	0.006	0.477	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	0.0020	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	0.020	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	0.029	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	0.29	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	0.087	0.010	0.541	<0.005	<0.005	0.006	<0.005	<0.005	0.060	<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	0.87	0.10	5.41	<0.05	<0.05	0.06	<0.05	<0.05	0.60	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	0.009	0.006	0.004	0.012	0.004	0.006	<0.002	0.009	0.011	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	0.09	0.06	0.04	0.12	0.04	0.06	<0.02	0.09	0.11	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	0.007	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	0.07	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	0.013	0.045	4.186	0.004	0.005	0.008	0.004	<0.003	0.011	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	0.13	0.45	41.86	0.04	0.05	0.08	0.04	<0.03	0.11	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	0.00008	<0.00001	<0.00001	0.00002	<0.00001	<0.00001	<0.00001	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	0.0008	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	1.0	<0.3	<0.3	0.3	0.4	<0.3	0.4	<0.3	<0.3	<0.3	<0.3	mg/l	TM173/PM0
Fluoride	10	<3	<3	3	4	<3	4	<3	<3	<3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	58.9	21.4	39.8	828.2	7.7	7.4	23.4	1.7	376.2	13.2	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	589	214	398	8282	77	74	234	17	3762	132	<5	mg/kg	TM38/PM0
Chloride #	57.8	0.5	8.9	2.6	0.8	8.7	0.9	0.6	0.5	0.7	<0.3	mg/l	TM38/PM0
Chloride #	578	5	89	26	8	87	9	6	5	7	<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	3	<2	<2	3	3	6	6	4	2	<2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30	<20	<20	30	30	60	60	40	<20	<20	<20	mg/kg	TM60/PM0
pH	8.24	9.06	8.67	7.26	8.26	8.32	8.14	8.49	7.71	8.62	<0.01	pH units	TM73/PM0
Total Dissolved Solids #	278	100	102	1523	62	62	99	71	591	86	<35	mg/l	TM20/PM0
Total Dissolved Solids #	2781	1000	1020	15230	620	620	990	710	5910	860	<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	61-63	64-66	67-69	70-72	73-75	76-78	79-81	82-84	85-87	88-90	LOD/LOR	Units	Method No.
Sample ID	WS-17	WS-18	WS-18	WS-18	WS-19	WS-19	WS-20	WS-21	WS-21	WS-21			
Depth	0.00-1.00	0.00-1.00	1.00-2.00	2.00-2.80	0.00-1.00	1.00-1.60	0.00-1.00	0.00-1.00	1.00-2.00	2.00-3.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	02/09/2019	02/09/2019	02/09/2019	02/09/2019	03/09/2019	03/09/2019	29/08/2019	29/08/2019	29/08/2019	29/08/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019			
Dissolved Antimony #	<0.002	0.027	0.010	<0.002	<0.002	0.003	<0.002	0.002	0.006	0.002	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	0.27	0.10	<0.02	<0.02	0.03	<0.02	0.02	0.06	0.02	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	0.0033	0.0080	0.0068	0.0040	<0.0025	0.0039	0.0030	<0.0025	<0.0025	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	0.033	0.080	0.068	0.040	<0.025	0.039	0.030	<0.025	<0.025	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.011	0.025	0.011	0.031	0.016	0.018	0.015	0.003	0.012	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.11	0.25	0.11	0.31	0.16	0.18	0.15	0.03	0.12	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	0.0017	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	0.017	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	0.0018	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	0.018	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	0.028	0.014	0.015	0.021	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	0.28	0.14	0.15	0.21	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	0.011	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	0.11	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.007	0.006	0.003	0.006	0.018	0.017	0.016	0.004	0.003	0.003	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.07	0.06	0.03	0.06	0.18	0.17	0.16	0.04	0.03	0.03	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	0.009	<0.003	0.005	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	0.09	<0.03	0.05	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	0.029	0.007	0.607	0.003	<0.003	<0.003	<0.003	0.004	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	0.29	0.07	6.07	0.03	<0.03	<0.03	<0.03	0.04	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	0.00005	0.00003	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	0.0005	0.0003	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	0.4	0.5	0.4	0.5	0.5	0.5	0.3	<0.3	0.5	<0.3	<0.3	mg/l	TM173/PM0
Fluoride	4	5	4	5	5	5	3	<3	5	<3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	258.1	18.9	40.3	149.5	10.5	35.2	60.5	9.9	21.2	18.7	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	2582	189	403	1495	105	352	605	99	212	187	<5	mg/kg	TM38/PM0
Chloride #	3.9	2.3	9.0	6.7	0.6	2.1	0.5	1.7	8.9	18.2	<0.3	mg/l	TM38/PM0
Chloride #	39	23	90	67	6	21	5	17	89	182	<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	<2	17	7	<2	4	3	3	3	5	3	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	170	70	<20	40	30	30	30	50	30	<20	mg/kg	TM60/PM0
pH	7.84	8.38	9.34	7.68	10.74	8.30	10.04	8.63	8.30	8.21	<0.01	pH units	TM73/PM0
Total Dissolved Solids #	426	133	152	403	95	103	166	61	142	122	<35	mg/l	TM20/PM0
Total Dissolved Solids #	4262	1330	1520	4030	950	1031	1661	610	1421	1220	<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	91-93	94-96	97-99	100-102	103-105						LOD/LOR	Units	Method No.
Sample ID	WS-21	WS-22	WS-23	WS-23	WS-24								
Depth	3.00-4.00	0.00-1.00	0.00-1.00	1.00-2.00	0.00-0.50								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	29/08/2019	29/08/2019	02/09/2019	02/09/2019	02/09/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019								
Dissolved Antimony #	<0.002	0.003	0.006	<0.002	<0.002						<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	0.03	0.06	<0.02	<0.02						<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	0.0026	<0.0025	<0.0025	<0.0025						<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	0.026	<0.025	<0.025	<0.025						<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	0.011	0.028	0.021	0.014						<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	0.11	0.28	0.21	0.14						<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005						<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005						<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015						<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015						<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	0.008	<0.007						<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	0.08	<0.07						<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005						<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.007	0.008	0.019	0.008	0.026						<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.07	0.08	0.19	0.08	0.26						<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002						<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02						<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	0.011						<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	0.11						<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	0.005	0.005	<0.003						<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	0.05	0.05	<0.03						<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001						<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001						<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	0.4	0.5	0.4	0.8						<0.3	mg/l	TM173/PM0
Fluoride	<3	4	5	4	8						<3	mg/kg	TM173/PM0
Sulphate as SO4 #	12.9	68.3	208.9	21.2	470.4						<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	129	683	2089	212	4703						<5	mg/kg	TM38/PM0
Chloride #	16.7	0.8	0.3	<0.3	0.8						<0.3	mg/l	TM38/PM0
Chloride #	167	8	3	<3	8						<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	3	2	2	3	3						<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30	<20	20	30	30						<20	mg/kg	TM60/PM0
pH	8.26	8.06	7.90	7.20	10.30						<0.01	pH units	TM73/PM0
Total Dissolved Solids #	98	156	378	78	805						<35	mg/l	TM20/PM0
Total Dissolved Solids #	980	1560	3780	780	8048						<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : EN12457_2

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30						
Sample ID	WS-01	WS-02	WS-03	WS-04	WS-04	WS-04	WS-05	WS-05	WS-07	WS-09						
Depth	0.00-0.50	0.00-0.50	0.00-0.54	0.00-1.00	1.00-2.00	2.00-2.20	0.00-1.00	1.00-1.70	0.00-0.70	0.00-1.00						
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	02/09/2019	02/09/2019	02/09/2019	02/09/2019	02/09/2019	02/09/2019	02/09/2019	02/09/2019	30/08/2019	30/08/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1	1	1	1						
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	0.43	0.17	0.52	0.37	0.08	0.14	0.47	0.11	0.32	7.10	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025 SV	<0.025 SV	<0.025 SV	<0.025	<0.025	<0.025	<0.025 SV	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg	TM31/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	150	<30	<30	<30	<30	<30	<30	<30	<30	<30	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	0.27	<0.22	0.47	1.04	<0.22	<0.22	0.51	<0.22	<0.22	36.49	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	0.64	<0.64	0.77	1.94	<0.64	<0.64	0.92	<0.64	<0.64	66.95	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.046	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	1.10	0.79	0.98	0.03	<0.03	<0.03	0.04	<0.03	0.18	0.35	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.08	2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.10	0.09	0.11	0.09	0.05	0.08	0.15	0.06	0.09	0.05	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	0.06	0.06	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	1060	870	700	650	810	1200	660	760	4688	870	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30	<20	<20	30	<20	40	30	<20	<20	40	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.0963	0.0948	0.0877	0.0973	0.105	0.0996	0.1071	0.1019	0.0942	0.1078	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	93.4	94.8	102.3	92.5	85.3	90.3	84.0	88.4	95.1	83.3	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.894	0.895	0.9	0.893	0.884	0.89	0.883	0.888	0.895	0.882	-	-	-		l	NONE/PM17
Eluate Volume	0.85	0.85	0.82	0.85	0.75	0.85	0.75	0.82	0.82	0.8	-	-	-		l	NONE/PM17
pH #	9.13	8.51	8.97	9.01	9.05	9.16	9.06	9.14	8.69	8.66	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	<3	5	<3	8	<3	4	<3	<3	<3	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	126	231	114	10	54	115	124	66	2825	98	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	34	4	<3	<3	12	246	22	30	40	8	800	15000	25000	<3	mg/kg	TM38/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : EN12457_2

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54	55-57	58-60	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	WS-09	WS-10	WS-10	WS-11	WS-12	WS-12	WS-13	WS-13	WS-14	WS-16						
Depth	1.00-1.50	0.00-1.00	1.00-2.00	0.00-0.70	0.00-1.00	1.00-2.00	0.00-1.00	1.00-2.00	0.00-1.00	0.00-1.00						
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	30/08/2019	29/08/2019	29/08/2019	03/09/2019	30/08/2019	30/08/2019	03/09/2019	03/09/2019	28/08/2019	03/09/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1	1	1	1						
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019						
Solid Waste Analysis																
Total Organic Carbon #	1.85	0.67	NDP	1.56	2.16	0.76	8.07	1.51	0.10	0.95	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025 SV	<0.025 SV	<0.025 SV	<0.025	<0.025	<0.025 SV	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg	TM31/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.175 BB	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	117	<30	201	<30	<30	<30	<30	38	72	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	3.25	1.92	0.83	<2.20 BC	2.69	1.17	45.63	<0.22	<0.22	2.50	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	6.20	3.45	1.54	<6.40 BC	5.16	2.20	77.78	<0.64	<0.64	4.50	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	0.222	<0.025	<0.025	0.038	0.031	0.163	<0.025	<0.025	0.153	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	<0.03	1.46	0.73	1.21	<0.03	<0.03	0.10	<0.03	0.16	1.81	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	0.006	0.477	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	0.020	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	0.29	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	<0.0001	0.0008	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	<0.02	0.09	0.06	0.04	0.12	0.04	0.06	<0.02	0.09	0.11	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	0.87	0.10	5.41	<0.05	<0.05	0.06	<0.05	<0.05	0.60	0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	0.17	<0.02	0.14	0.05	<0.02	0.38	0.06	<0.02	0.21	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	0.07	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	0.13	0.45	41.86	0.04	0.05	0.08	0.04	<0.03	0.11	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	2781	1000	1020	15230	620	620	990	710	5910	860	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30	<20	<20	30	30	60	60	40	<20	<20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1299	0.095	0.0964	0.0978	0.1019	0.0991	0.1115	0.1073	0.0935	0.1011	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	69.1	94.5	93.4	91.8	88.6	90.6	80.9	83.5	95.8	89.2	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.86	0.895	0.894	0.892	0.888	0.891	0.879	0.882	0.896	0.889	-	-	-		l	NONE/PM17
Eluate Volume	0.7	0.85	0.8	0.8	0.8	0.85	0.85	0.8	0.8	0.85	-	-	-		l	NONE/PM17
pH #	8.57	8.81	8.68	7.91	8.78	9.18	8.68	8.80	8.44	8.82	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	10	<3	<3	3	4	<3	4	<3	<3	<3	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	589	214	398	8282	77	74	234	17	3762	132	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	578	5	89	26	8	87	9	6	5	7	800	15000	25000	<3	mg/kg	TM38/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : EN12457_2

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	61-63	64-66	67-69	70-72	73-75	76-78	79-81	82-84	85-87	88-90	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	WS-17	WS-18	WS-18	WS-18	WS-19	WS-19	WS-20	WS-21	WS-21	WS-21						
Depth	0.00-1.00	0.00-1.00	1.00-2.00	2.00-2.80	0.00-1.00	1.00-1.60	0.00-1.00	0.00-1.00	1.00-2.00	2.00-3.00						
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	02/09/2019	02/09/2019	02/09/2019	02/09/2019	03/09/2019	03/09/2019	29/08/2019	29/08/2019	29/08/2019	29/08/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1	1	1	1						
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019						
Solid Waste Analysis																
Total Organic Carbon #	0.10	NDP	NDP	20.55	0.44	0.70	0.26	1.09	2.78	0.68	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025 SV	<0.025 SV	<0.025 SV	<0.025 SV	<0.025	<0.025	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg	TM31/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.175 BB	<0.175 BB	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	108	191	819 BA	34	<30	<30	<30	<30	<30	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	25.83	62.63 BC	28.40 BC	3.18	5.36	<0.22	3.92	1.72	<0.22	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	50.08	82.84 BC	56.17 BC	6.23	10.57	<0.64	7.71	3.12	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	0.033	0.080	0.068	0.040	<0.025	0.039	0.030	<0.025	<0.025	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.11	0.25	0.11	0.31	0.16	0.18	0.15	0.03	0.12	<0.03	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	0.017	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	0.018	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	0.28	0.14	0.15	0.21	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	0.0005	0.0003	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.07	0.06	0.03	0.06	0.18	0.17	0.16	0.04	0.03	0.03	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	0.11	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	0.27	0.10	<0.02	<0.02	0.03	<0.02	0.02	0.06	0.02	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	0.09	<0.03	0.05	<0.03	<0.03	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	0.29	0.07	6.07	0.03	<0.03	<0.03	<0.03	0.04	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	4262	1330	1520	4030	950	1031	1661	610	1421	1220	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	170	70	<20	40	30	30	30	50	30	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.096	0.1073	0.1068	0.1216	0.0981	0.0989	0.0976	0.1015	0.1164	0.111	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	93.4	84.0	84.0	73.8	91.8	90.5	92.5	88.2	77.3	80.9	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.894	0.883	0.883	0.868	0.892	0.891	0.893	0.888	0.874	0.879	-	-	-		l	NONE/PM17
Eluate Volume	0.85	0.85	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.75	-	-	-		l	NONE/PM17
pH #	8.65	8.41	8.71	7.91	10.05	8.59	9.44	9.00	8.58	8.55	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	4	5	4	5	5	5	3	<3	5	<3	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	2582	189	403	1495	105	352	605	99	212	187	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	39	23	90	67	6	21	5	17	89	182	800	15000	25000	<3	mg/kg	TM38/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton
EMT Job No: 19/14295

Report : EN12457_2

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	91-93	94-96	97-99	100-102	103-105						Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	WS-21	WS-22	WS-23	WS-23	WS-24											
Depth	3.00-4.00	0.00-1.00	0.00-1.00	1.00-2.00	0.00-0.50											
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T											
Sample Date	29/08/2019	29/08/2019	02/09/2019	02/09/2019	02/09/2019											
Sample Type	Soil	Soil	Soil	Soil	Soil											
Batch Number	1	1	1	1	1											
Date of Receipt	05/09/2019	05/09/2019	05/09/2019	05/09/2019	05/09/2019											
Solid Waste Analysis																
Total Organic Carbon #	0.72	0.62	1.51	0.84	0.21						3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025						6	-	-	<0.025	mg/kg	TM31/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035	<0.035						1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	105	<30	<30	<30	<30						500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	0.72	1.61	2.05	2.94	<0.22						-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	1.22	2.91	4.05	5.56	<0.64						100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	0.026	<0.025	<0.025	<0.025						0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	<0.03	0.11	0.28	0.21	0.14						20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005						0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015	<0.015	<0.015	<0.015						0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	0.08	<0.07						2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001						0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.07	0.08	0.19	0.08	0.26						0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02						0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05	<0.05	<0.05						0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	0.03	0.06	<0.02	<0.02						0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	0.11						0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	0.05	0.05	<0.03						4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	980	1560	3780	780	8048						4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30	<20	20	30	30						500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1026	0.0988	0.1054	0.1001	0.099						-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	87.6	91.1	85.7	90.1	91.2						-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.887	0.891	0.885	0.89	0.891						-	-	-		l	NONE/PM17
Eluate Volume	0.8	0.8	0.8	0.85	0.85						-	-	-		l	NONE/PM17
pH #	8.95	8.57	8.35	8.81	10.52						-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1						1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	4	5	4	8						-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	129	683	2089	212	4703						1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	167	8	3	<3	8						800	15000	25000	<3	mg/kg	TM38/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland

Reference: 8979-08-19

Location: Galway Docklands/Port

Contact: Barry Sexton

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
19/14295	1	WS-01	0.00-0.50	1-3	Possible tarmac/bitumen
19/14295	1	WS-02	0.00-0.50	4-6	No interpretation possible
19/14295	1	WS-03	0.00-0.54	7-9	No interpretation possible
19/14295	1	WS-04	0.00-1.00	10-12	No interpretation possible
19/14295	1	WS-04	1.00-2.00	13-15	No interpretation possible
19/14295	1	WS-04	2.00-2.20	16-18	No interpretation possible
19/14295	1	WS-05	0.00-1.00	19-21	No interpretation possible
19/14295	1	WS-05	1.00-1.70	22-24	No interpretation possible
19/14295	1	WS-07	0.00-0.70	25-27	No interpretation possible
19/14295	1	WS-09	0.00-1.00	28-30	PAH's
19/14295	1	WS-09	1.00-1.50	31-33	No interpretation possible
19/14295	1	WS-10	0.00-1.00	34-36	Possible tarmac/bitumen & Lubricating oil
19/14295	1	WS-10	1.00-2.00	37-39	No interpretation possible
19/14295	1	WS-11	0.00-0.70	40-42	Possible tarmac/bitumen, Lubricating oil & PAH's
19/14295	1	WS-12	0.00-1.00	43-45	No interpretation possible
19/14295	1	WS-12	1.00-2.00	46-48	No interpretation possible
19/14295	1	WS-13	0.00-1.00	49-51	PAH's & Possible trace of degraded diesel
19/14295	1	WS-13	1.00-2.00	52-54	No interpretation possible
19/14295	1	WS-14	0.00-1.00	55-57	No interpretation possible
19/14295	1	WS-16	0.00-1.00	58-60	Possible PAH's & Possible trace of degraded diesel
19/14295	1	WS-17	0.00-1.00	61-63	No interpretation possible
19/14295	1	WS-18	0.00-1.00	64-66	PAH's, Possible lubricating oil & Possible trace of degraded diesel
19/14295	1	WS-18	1.00-2.00	67-69	PAH's & Possible tarmac/bitumen
19/14295	1	WS-18	2.00-2.80	70-72	PAH's, Lubricating oil & Possible tarmac/bitumen
19/14295	1	WS-19	0.00-1.00	73-75	Possible tarmac/bitumen & Possible PAH's
19/14295	1	WS-19	1.00-1.60	76-78	No interpretation possible
19/14295	1	WS-20	0.00-1.00	79-81	No interpretation possible
19/14295	1	WS-21	0.00-1.00	82-84	No interpretation possible
19/14295	1	WS-21	1.00-2.00	85-87	No interpretation possible
19/14295	1	WS-21	2.00-3.00	88-90	No interpretation possible
19/14295	1	WS-21	3.00-4.00	91-93	Lubricating oil
19/14295	1	WS-22	0.00-1.00	94-96	PAH's

Client Name: Ground Investigations Ireland

Reference: 8979-08-19

Location: Galway Docklands/Port

Contact: Barry Sexton

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
19/14295	1	WS-23	0.00-1.00	97-99	No interpretation possible
19/14295	1	WS-23	1.00-2.00	100-102	No interpretation possible
19/14295	1	WS-24	0.00-0.50	103-105	No interpretation possible

Client Name: Ground Investigations Ireland
Reference: 19/08/8979
Location: Galway Docklands/Port
Contact: Barry Sexton

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Element Materials Technology:

Ryan Butterworth
Asbestos Team Leader

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
19/14295	1	WS-01	0.00-0.50	2	06/09/2019	**General Description (Bulk Analysis)**	Soil
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-02	0.00-0.50	5	06/09/2019	**General Description (Bulk Analysis)**	Soil
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-03	0.00-0.54	8	06/09/2019	**General Description (Bulk Analysis)**	Soil
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-04	0.00-1.00	11	06/09/2019	**General Description (Bulk Analysis)**	Soil
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-04	1.00-2.00	14	06/09/2019	**General Description (Bulk Analysis)**	soil-stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-04	2.00-2.20	17	06/09/2019	**General Description (Bulk Analysis)**	soil-stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-05	0.00-1.00	20	06/09/2019	**General Description (Bulk Analysis)**	soil-stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD

Client Name: Ground Investigations Ireland
Reference: 19/08/8979
Location: Galway Docklands/Port
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
19/14295	1	WS-05	0.00-1.00	20	06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-05	1.00-1.70	23	06/09/2019	**General Description (Bulk Analysis)**	soil-stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-07	0.00-0.70	26	06/09/2019	**General Description (Bulk Analysis)**	Soil/Stone
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-09	0.00-1.00	29	06/09/2019	**General Description (Bulk Analysis)**	Soil/Stone
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-09	1.00-1.50	32	10/09/2019	**General Description (Bulk Analysis)**	soil/stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-10	0.00-1.00	35	10/09/2019	**General Description (Bulk Analysis)**	soil.stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-10	1.00-2.00	38	06/09/2019	**General Description (Bulk Analysis)**	soil-stones
					06/09/2019	**Asbestos Fibres**	Fibre Bundles
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	Chrysotile
					06/09/2019	**Asbestos Level Screen**	less than 0.1%
					17/09/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					17/09/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					17/09/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
19/14295	1	WS-11	0.00-0.70	41	06/09/2019	**General Description (Bulk Analysis)**	soil-stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-12	0.00-1.00	44	09/09/2019	**General Description (Bulk Analysis)**	Soil/Stones
					09/09/2019	**Asbestos Fibres**	NAD
					09/09/2019	**Asbestos ACM**	NAD
					09/09/2019	**Asbestos Type**	NAD
					09/09/2019	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland
Reference: 19/08/8979
Location: Galway Docklands/Port
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
19/14295	1	WS-12	1.00-2.00	47	09/09/2019	**General Description (Bulk Analysis)**	Soil/Stones
					09/09/2019	**Asbestos Fibres**	NAD
					09/09/2019	**Asbestos ACM**	NAD
					09/09/2019	**Asbestos Type**	NAD
					09/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-13	0.00-1.00	50	06/09/2019	**General Description (Bulk Analysis)**	soil.stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-13	1.00-2.00	53	06/09/2019	**General Description (Bulk Analysis)**	soil.stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-14	0.00-1.00	56	06/09/2019	**General Description (Bulk Analysis)**	soil.stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-16	0.00-1.00	59	06/09/2019	**General Description (Bulk Analysis)**	soil.stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-17	0.00-1.00	62	06/09/2019	**General Description (Bulk Analysis)**	Soil/Stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-18	0.00-1.00	65	06/09/2019	**General Description (Bulk Analysis)**	Soil/Stones
					06/09/2019	**Asbestos Fibres**	Fibre Bundles
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	Chrysotile
					06/09/2019	**Asbestos Level Screen**	less than 0.1%
					17/09/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					17/09/2019	**Total Detailed Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					17/09/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	<0.001 (mass %)
19/14295	1	WS-18	1.00-2.00	68	06/09/2019	**General Description (Bulk Analysis)**	Soil/Stones
					06/09/2019	**Asbestos Fibres**	Fibre Bundles
					06/09/2019	**Asbestos Fibres (2)**	Fibre Bundles
					06/09/2019	**Asbestos ACM**	Bitumen Products
					06/09/2019	**Asbestos ACM (2)**	NAD
					06/09/2019	**Asbestos Type**	Chrysotile
					06/09/2019	**Asbestos Type (2)**	Amosite
					06/09/2019	**Asbestos Level Screen**	less than 0.1%

Client Name: Ground Investigations Ireland
Reference: 19/08/8979
Location: Galway Docklands/Port
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
19/14295	1	WS-18	1.00-2.00	68	17/09/2019	**Total ACM Gravimetric Quantification (% Asb)**	<0.001 (mass %)
					17/09/2019	**Total Detailed Gravimetric Quantification (% Asb)**	0.051 (mass %)
					17/09/2019	**Total Gravimetric Quantification (ACM + Detailed) (% Asb)**	0.051 (mass %)
19/14295	1	WS-18	2.00-2.80	71	06/09/2019	**General Description (Bulk Analysis)**	Soil/Stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-19	0.00-1.00	74	10/09/2019	**General Description (Bulk Analysis)**	soil/stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-19	1.00-1.60	77	10/09/2019	**General Description (Bulk Analysis)**	soil/stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-20	0.00-1.00	80	10/09/2019	**General Description (Bulk Analysis)**	soil/stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-21	0.00-1.00	83	06/09/2019	**General Description (Bulk Analysis)**	soil.stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-21	1.00-2.00	86	06/09/2019	**General Description (Bulk Analysis)**	soil.stones
					06/09/2019	**Asbestos Fibres**	NAD
					06/09/2019	**Asbestos ACM**	NAD
					06/09/2019	**Asbestos Type**	NAD
					06/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-21	2.00-3.00	89	10/09/2019	**General Description (Bulk Analysis)**	soil.stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-21	3.00-4.00	92	10/09/2019	**General Description (Bulk Analysis)**	soil.stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland
Reference: 19/08/8979
Location: Galway Docklands/Port
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
19/14295	1	WS-22	0.00-1.00	95	10/09/2019	**General Description (Bulk Analysis)**	soil.stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-23	0.00-1.00	98	10/09/2019	**General Description (Bulk Analysis)**	Soil/Stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-23	1.00-2.00	101	10/09/2019	**General Description (Bulk Analysis)**	Soil/Stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD
19/14295	1	WS-24	0.00-0.50	104	10/09/2019	**General Description (Bulk Analysis)**	Soil/Stones
					10/09/2019	**Asbestos Fibres**	NAD
					10/09/2019	**Asbestos ACM**	NAD
					10/09/2019	**Asbestos Type**	NAD
					10/09/2019	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland

Reference: 8979-08-19

Location: Galway Docklands/Port

Contact: Barry Sexton

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Method No.	NDP Reason
19/14295	1	WS-10	1.00-2.00	37-39	TM21/PM24	Asbestos detected in sample
19/14295	1	WS-18	0.00-1.00	64-66	TM21/PM24	Asbestos detected in sample
19/14295	1	WS-18	1.00-2.00	67-69	TM21/PM24	Asbestos detected in sample

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Docklands/Port
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/14295						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/14295

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x3 Dilution

AB	x5 Dilution
AC	x10 Dilution
BA	x3 Dilution
BB	x5 Dilution
BC	x10 Dilution

EMT Job No: 19/14295

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 19/14295

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes

EMT Job No: 19/14295

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060, APHA Standard Methods for Examination of Water and Wastewater 5310B, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM131	Quantification of Asbestos Fibres and ACM, based on HSG248 and SCA method.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes

EMT Job No: 19/14295

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM17	Modified method BS EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

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Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

Attention :	Barry Sexton
Date :	3rd October, 2019
Your reference :	8979-08-19
Our reference :	Test Report 19/15445 Batch 1
Location :	Galway Port
Date samples received :	23rd September, 2019
Status :	Final report
Issue :	1

Two samples were received for analysis on 23rd September, 2019 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Ed Moore B.ENG
Scheduling Manager

Element Materials Technology Environmental UK Limited
Registered in England and Wales
Registered Office: 10 Lower Grosvenor Place, London, SW1W 0EN
Company Registration No: 11371415

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Port
Contact: Barry Sexton
EMT Job No: 19/15445

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-10	11-20									LOD/LOR	Units	Method No.
Sample ID	WS-28/GW-01	WS-29/GW-02											
Depth													
COC No / misc													
Containers	V H HNUF HCL Z P G	V H HNUF HCL Z P G											
Sample Date	19/09/2019	19/09/2019											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	23/09/2019	23/09/2019											
Dissolved Arsenic #	<2.5	7.6									<2.5	ug/l	TM30/PM14
Dissolved Barium #	17	60									<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Boron	774	1081									<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	<3	<3									<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	1507_{AA}	2229_{AA}									<1	mg/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Acenaphthene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Fluorene #	<0.014	<0.014									<0.014	ug/l	TM4/PM30
Phenanthrene #	<0.011	0.025									<0.011	ug/l	TM4/PM30
Anthracene #	<0.013	<0.013									<0.013	ug/l	TM4/PM30
Fluoranthene #	0.024	0.107									<0.012	ug/l	TM4/PM30
Pyrene #	0.022	0.140									<0.013	ug/l	TM4/PM30
Benzo(a)anthracene #	0.017	<0.015									<0.015	ug/l	TM4/PM30
Chrysene #	0.016	0.011									<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene #	0.031	<0.018									<0.018	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.016	<0.016									<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.01	<0.01									<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.011	<0.011									<0.011	ug/l	TM4/PM30
PAH 16 Total #	<0.195	0.283									<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	0.02	<0.01									<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01	<0.01									<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	91	93									<0	%	TM4/PM30
MTBE #	<5	<5									<5	ug/l	TM31/PM12
Benzene #	<5	<5									<5	ug/l	TM31/PM12
Toluene #	<5	<5									<5	ug/l	TM31/PM12
Ethylbenzene #	<5	<5									<5	ug/l	TM31/PM12
m/p-Xylene #	<5	<5									<5	ug/l	TM31/PM12
o-Xylene #	<5	<5									<5	ug/l	TM31/PM12

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Port
Contact: Barry Sexton
EMT Job No: 19/15445

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-10	11-20									LOD/LOR	Units	Method No.
Sample ID	WS-28/GW-01	WS-29/GW-02											
Depth													
COC No / misc													
Containers	V H HNUF HCL Z P G	V H HNUF HCL Z P G											
Sample Date	19/09/2019	19/09/2019											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	23/09/2019	23/09/2019											
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/l	TM26/PM0
Sulphate as SO4 #	457.7	615.5									<0.5	mg/l	TM38/PM0
Total Cyanide #	0.14	0.02									<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	0.71	0.78									<0.03	mg/l	TM38/PM0
pH #	7.62	7.55									<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 8979-08-19
Location: Galway Port
Contact: Barry Sexton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/15445						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 19/15445

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

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Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

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REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

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Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

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BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

EMT Job No: 19/15445

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.				
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes			
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes			

EMT Job No: 19/15445

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			

APPENDIX 6

ASSESSMENT TABLES

ASSESSMENT CRITERIA

Table 6.1 below sets out MKOs rationale for generic assessment criteria (GAC) adoption in order to evaluate risks posed to potential receptors at Galway Harbour Site from identified chemical contamination. The results of the assessment for the Galway Harbour Site are then presented in Tables 6.2 to 6.7 of this appendix.

Table 6.1. Rationale for Assessment Criteria Adoption

Source / Media	MKO's Approach & Rationale
Risks to Human Health	
Soil Contaminants	▪ Laboratory test results have been compared against Generic Assessment Criteria (GAC) derived by LQM/CIEH (Suitable 4 Use Levels) for a number of end use scenarios including Residential (without Private Gardens) and Commercial land use scenario. ▪ It is noted that the Soil Guideline Value (SGV) for lead has been withdrawn and that the Category 4 Screening Level (C4SL) for lead will be used in its place. ▪ Where the dataset is of appropriate size, assessment against the applicable GAC or C4SL is carried out at the 95th percentile of the sample mean (designated US95), which is considered to represent a reasonable worst-case scenario. An assessment of the normality of the data has been undertaken. Where datasets are normally distributed the one sample t-test has been applied to calculate the US95. In the case of non-parametric datasets, the Chebychev Theorem has been applied. The Grubbs Test has also been used to identify potential outliers within datasets. ▪ At this time an authoritative GAC is not available for asbestos fibres in soil. A positive identification of asbestos fibres in a soil sample by the laboratory is considered sufficient to warrant additional assessment of risks. Laboratory identification and quantification by microscopy may be required subject to source of material.
Ground Gas	Concentrations and flow rates of carbon dioxide and methane in ground gas are converted to Gas Screening Values (GSVs) in accordance with CIRIA C665 (2007).
Risks to Controlled Waters	
Dissolved Contaminants	Results have been directly compared to Environmental Quality Standards (EQS) and Groundwater Threshold Values (GTV) as an initial screen of water quality. These are considered to be conservative screening criteria. In the absence of specific EQS and GTV values, EPA interim guideline values (IGV) have been used.
Risks to Buildings and Structures	
Water supply Pipes	The evaluation of water supply pipe requirements at the site has been undertaken in general accordance with guidance and criteria produced by the UK Water Industry (2011).

Risks to Vegetation and Plants	
Soil Contaminants	Risks to plant growth (i.e. phytotoxicity) have been assessed for specific contaminants where the limits for phytotoxic effect proposed (e.g. by BS 3882) are significantly lower than the health GAC.

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Table 6.2 Summary of soil contamination (risks to human health) from Made Ground

Contaminant	GAC @ 1% SOM for Residential without Private Gardens land-use (mg/kg)	Measured range (mg/kg)	US95 (mg/kg)	US95 > Assessment Criteria? (Y/N) #- outlier detected
Soil Organic Matter	-	0.17 to 35.3	-	-
Arsenic	40	1.7 to 79.5	30.8	N
Cadmium	85	0.1 to 115.3	24.06	N#
Chromium (total)	910	10.8 to 131.9	67.79	N
Chromium VI	6.0	<0.3	0.3	N
Lead	310	5 to 4,882	1,646.21	Y
Mercury (inorganic)	56	<0.1 to 1.5	0.58	N
Selenium	430	<0.1 to 6.0	2.03	N#
Copper	7,100	<0.1 to 2,146	431.91	N#
Nickel	180	5.6 to 47.8	19.62	N#
Zinc	40,000	13.0 to 10,741	2,652.85	N
Barium	*	13.0 to 2,381	812.267	*
BTEX compounds[2]				
Benzene	0.38	<0.005	0.005	N
Toluene	880	<0.005 to 0.019	0.008	N#
Ethyl benzene	83	<0.005	0.005	N
m-xylene[6]	82	<0.005	0.005	N
o-xylene[6]	88	<0.005	0.005	N
Total Petroleum Hydrocarbons (TPH)[2]				
TPH aliphatic EC5-6	42	<0.1	0.1	N
TPH aliphatic EC>6-8	100	<0.1	0.1	N
TPH aliphatic EC>8-10	27	<0.1	0.1	N
TPH aliphatic EC>10-12	130	<0.2 to <0.6	0.27	N#
TPH aliphatic EC>12-16	1,100	<4.0 to <12.0	5.87	N#
TPH aliphatic EC>16-35	65,000	<14.0 to 740.0	162.57	N#
TPH aromatic EC5-7	370	<0.1	0.1	N
TPH aromatic EC>7-8	860	<0.1	0.1	N
TPH aromatic EC>8-10	47	<0.1	0.1	N
TPH aromatic EC>10-12	250	<0.2 to <0.6	0.27	N#
TPH aromatic EC>12-16	1,800	<4.0 to <12.0	5.81	N#
TPH aromatic EC>16-21	1,900	<7.0 to 117	35.00	N#
TPH aromatic EC>21-35	1,900	<7.0 to 1,284	358.42	N

Contaminant	GAC @ 1% SOM for Residential without Private Gardens land-use (mg/kg)	Measured range (mg/kg)	US95 (mg/kg)	US95 > Assessment Criteria? (Y/N) #- outlier detected
Polycyclic Aromatic Hydrocarbons (PAH) [2]				
Acenaphthene	3,000	<0.05 to 0.5	0.21	N#
Anthracene	31,000	<0.04 to 1.82	0.72	N
Benzo(a)anthracene	11	<0.06 to 8.24	2.79	N
Benzo(a)pyrene	3.2	<0.04 to 12.7	3.72	Y
Benzo(b)fluoranthene	3.9	<0.05 to 14.05	4.64	Y
Benzo(g,h,i)perylene	360	<0.04 to 13.63	3.23	N
Benzo(k)fluoranthene	110	<0.02 to 5.46	1.80	N
Chrysene	30	<0.02 to 6.77	2.62	N
Dibenzo(a,h)anthracene	0.31	<0.04 to 2.17	0.62	Y#
Fluoranthene	1,500	<0.03 to 10.51	3.86	N
Fluorene	2,800	<0.04 to 0.52	0.22	N
Indeno(1,2,3-cd)pyrene	45	<0.04 to 12.85	3.10	N
Naphthalene	2.3	<0.04 to 1.18	0.38	N
Pyrene	3,700	<0.03 to 9.12	3.48	N
Phenol	750	<0.1	0.1	N

1. * = No values defined or given.
2. The S4ULs have been generated assuming a sandy loam soil type and a Soil Organic Material of 1%.

Table 6.3 Summary of soil contamination (risks to human health) from Made Ground

Contaminant	GAC @ 1% SOM for Commercial land-use (mg/kg)	Measured range (mg/kg)	US95 (mg/kg)	US95 > Assessment Criteria? (Y/N) #- outlier detected
Soil Organic Matter	-	0.17 to 35.3	-	-
Arsenic	640	1.7 to 79.5	30.8	N
Cadmium	190	0.1 to 115.3	24.06	N#
Chromium (total)	8,600	10.8 to 131.9	67.79	N
Chromium VI	33.0	<0.3	0.3	N
Lead	2,300	5 to 4,882	1,646.21	N
Mercury (inorganic)	1,100	<0.1 to 1.5	0.58	N
Selenium	12,000	<0.1 to 6.0	2.03	N#
Copper	68,000	<0.1 to 2,146	431.91	N#
Nickel	980	5.6 to 47.8	19.62	N#
Zinc	730,000	13.0 to 10,741	2,652.85	N
Barium	*	13.0 to 2,381	812.267	*
BTEX compounds[2]				
Benzene	27	<0.005	0.005	N
Toluene	56,000	<0.005 to 0.019	0.008	N#
Ethyl benzene	5,700	<0.005	0.005	N
m-xylene[6]	6,200	<0.005	0.005	N
o-xylene[6]	6,600	<0.005	0.005	N
Total Petroleum Hydrocarbons (TPH)[2]				
TPH aliphatic EC5-6	3,200	<0.1	0.1	N
TPH aliphatic EC>6-8	7,800	<0.1	0.1	N
TPH aliphatic EC>8-10	2,000	<0.1	0.1	N
TPH aliphatic EC>10-12	9,700	<0.2 to <0.6	0.27	N#
TPH aliphatic EC>12-16	59,000	<4.0 to <12.0	5.87	N#
TPH aliphatic EC>16-35	1,600000	<14.0 to 740.0	162.57	N#
TPH aromatic EC5-7	26,000	<0.1	0.1	N
TPH aromatic EC>7-8	56,000	<0.1	0.1	N
TPH aromatic EC>8-10	3,500	<0.1	0.1	N
TPH aromatic EC>10-12	16,000	<0.2 to <0.6	0.27	N#
TPH aromatic EC>12-16	36,000	<4.0 to <12.0	5.81	N#
TPH aromatic EC>16-21	28,000	<7.0 to 117	35.00	N#
TPH aromatic EC>21-35	28,000	<7.0 to 1,284	358.42	N

Contaminant	GAC @ 1% SOM for Commercial land-use (mg/kg)	Measured range (mg/kg)	US95 (mg/kg)	US95 > Assessment Criteria? (Y/N) #- outlier detected
Polycyclic Aromatic Hydrocarbons (PAH) [2]				
Acenaphthene	84,000	<0.05 to 0.5	0.21	N#
Anthracene	520,000	<0.04 to 1.82	0.72	N
Benzo(a)anthracene	170	<0.06 to 8.24	2.79	N
Benzo(a)pyrene	35	<0.04 to 12.7	3.72	N
Benzo(b)fluoranthene	44	<0.05 to 14.05	4.64	N
Benzo(g,h,i)perylene	3,900	<0.04 to 13.63	3.23	N
Benzo(k)fluoranthene	1,200	<0.02 to 5.46	1.80	N
Chrysene	350	<0.02 to 6.77	2.62	N
Dibenzo(a,h)anthracene	3.5	<0.04 to 2.17	0.62	N#
Fluoranthene	23,000	<0.03 to 10.51	3.86	N
Fluorene	63,000	<0.04 to 0.52	0.22	N
Indeno(1,2,3-cd)pyrene	500	<0.04 to 12.85	3.10	N
Naphthalene	190	<0.04 to 1.18	0.38	N
Pyrene	54,000	<0.03 to 9.12	3.48	N
Phenol	760	<0.1	0.1	N

1. * = No values defined or given.
2. The S4ULs have been generated assuming a sandy loam soil type and a Soil Organic Material of 1%.
3. The GAC for beryllium has been generated assuming a sandy loam soil type and 6% Soil Organic Material.

Table 6.4 Summary of soil contamination (risks to human health) from Natural Soil

Contaminant	GAC @ 1% SOM for Residential without Plant Uptake land-use (mg/kg)	Measured range (mg/kg)	Concentration > Assessment Criteria? (Y/N)
Soil Organic Matter	-	0.14 to 1.24	-
Arsenic	40	2.0 to 5.4	N
Cadmium	85	0.3 to 1.0	N
Chromium (total)	910	60.2 to 88.6	N
Chromium VI	6.0	<0.3	N
Lead	310	9 to 46.0	N
Mercury (inorganic)	56	<0.1	N
Selenium	430	<1.0	N
Copper	7,100	9.0 to 21.0	N
Nickel	180	6.9 to 22.8	N
Zinc	40,000	24.0 to 76.0	N
Barium	*	21.0 to 65.0	*
BTEX compounds[2]			
Benzene	0.38	<0.005	N
Toluene	880	<0.005	N
Ethyl benzene	83	<0.005	N
m-xylene[6]	82	<0.005	N
o-xylene[6]	88	<0.005	N
Total Petroleum Hydrocarbons (TPH)[2]			
TPH aliphatic EC5-6	42	<0.1	N
TPH aliphatic EC>6-8	100	<0.1	N
TPH aliphatic EC>8-10	27	<0.1	N
TPH aliphatic EC>10-12	130	<0.2	N
TPH aliphatic EC>12-16	1,100	<4.0	N
TPH aliphatic EC>16-35	65,000	<14.0 to 94.0	N
TPH aromatic EC5-7	370	<0.1	N
TPH aromatic EC>7-8	860	<0.1	N
TPH aromatic EC>8-10	47	<0.1	N
TPH aromatic EC>10-12	250	<0.2	N
TPH aromatic EC>12-16	1,800	<4.0	N
TPH aromatic EC>16-21	1,900	<7.0	N
TPH aromatic EC>21-35	1,900	<7.0	N

Contaminant	GAC @ 1% SOM for Residential without Plant Uptake land-use (mg/kg)	Measured range (mg/kg)	Concentration > Assessment Criteria? (Y/N)
Polycyclic Aromatic Hydrocarbons (PAH) [2]			
Acenaphthene	3,000	<0.05	N
Anthracene	31,000	<0.04	N
Benzo(a)anthracene	11	<0.06 to 0.14	N
Benzo(a)pyrene	3.2	<0.04 to 0.12	N
Benzo(b)fluoranthene	3.9	<0.05 to 0.17	N
Benzo(g,h,i)perylene	360	<0.04 to 0.10	N
Benzo(k)fluoranthene	110	<0.02 to 0.07	N
Chrysene	30	<0.02 to 0.12	N
Dibenzo(a,h)anthracene	0.31	<0.04	N
Fluoranthene	1,500	<0.03 to 0.17	N
Fluorene	2,800	<0.04	N
Indeno(1,2,3-cd)pyrene	45	<0.04 to 0.09	N
Naphthalene	2.3	<0.04	N
Pyrene	3,700	<0.03 to 0.17	N
Phenol	750	<0.1	N

1. * = No values defined or given.
2. The S4ULs have been generated assuming a sandy loam soil type and a Soil Organic Material of 1%.

Table 6.5 Summary of soil contamination (risks to human health) from Natural Soils

Contaminant	GAC @ 1% SOM for Commercial land-use (mg/kg)	Measured range (mg/kg)	Concentration > Assessment Criteria? (Y/N)
Soil Organic Matter	-	0.14 to 1.24	-
Arsenic	640	2.0 to 5.4	N
Cadmium	190	0.3 to 1.0	N
Chromium (total)	8,600	60.2 to 88.6	N
Chromium VI	33.0	<0.3	N
Lead	2,300	9 to 46.0	N
Mercury (inorganic)	1,100	<0.1	N
Selenium	12,000	<1.0	N
Copper	68,000	9.0 to 21.0	N
Nickel	980	6.9 to 22.8	N
Zinc	730,000	24.0 to 76.0	N
Barium	*	21.0 to 65.0	*
BTEX compounds[2]			
Benzene	27	<0.005	N
Toluene	56,000	<0.005	N
Ethyl benzene	5,700	<0.005	N
m-xylene[6]	6,200	<0.005	N
o-xylene[6]	6,600	<0.005	N
Total Petroleum Hydrocarbons (TPH)[2]			
TPH aliphatic EC5-6	3,200	<0.1	N
TPH aliphatic EC>6-8	7,800	<0.1	N
TPH aliphatic EC>8-10	2,000	<0.1	N
TPH aliphatic EC>10-12	9,700	<0.2	N
TPH aliphatic EC>12-16	59,000	<4.0	N
TPH aliphatic EC>16-35	1,600000	<14.0 to 94.0	N
TPH aromatic EC5-7	26,000	<0.1	N
TPH aromatic EC>7-8	56,000	<0.1	N
TPH aromatic EC>8-10	3,500	<0.1	N
TPH aromatic EC>10-12	16,000	<0.2	N
TPH aromatic EC>12-16	36,000	<4.0	N
TPH aromatic EC>16-21	28,000	<7.0	N
TPH aromatic EC>21-35	28,000	<7.0	N

Contaminant	GAC @ 1% SOM for Commercial land-use (mg/kg)	Measured range (mg/kg)	Concentration > Assessment Criteria? (Y/N)
Polycyclic Aromatic Hydrocarbons (PAH) [2]			
Acenaphthene	84,000	<0.05	N
Anthracene	520,000	<0.04	N
Benzo(a)anthracene	170	<0.06 to 0.14	N
Benzo(a)pyrene	35	<0.04 to 0.12	N
Benzo(b)fluoranthene	44	<0.05 to 0.17	N
Benzo(g,h,i)perylene	3,900	<0.04 to 0.10	N
Benzo(k)fluoranthene	1,200	<0.02 to 0.07	N
Chrysene	350	<0.02 to 0.12	N
Dibenzo(a,h)anthracene	3.5	<0.04	N
Fluoranthene	23,000	<0.03 to 0.17	N
Fluorene	63,000	<0.04	N
Indeno(1,2,3-cd)pyrene	500	<0.04 to 0.09	N
Naphthalene	190	<0.04	N
Pyrene	54,000	<0.03 to 0.17	N
Phenol	760	<0.1	N

1. * = No values defined or given.
2. The S4ULs have been generated assuming a sandy loam soil type and a Soil Organic Material of 1%.

Table 6.6. Summary of groundwater result from RSK Boreholes

Contaminant	AA-EQS (µg/l)	GTV (µg/l)	IGV (µg/l)	Measured range (µg/l)	No. of samples exceeding AA-EQS	No. of samples exceeding GTV	No. of samples exceeding IGV
Arsenic	25	**7.5**	10	**<2.5 – 7.6**	0 of 2	**1 of 2**	0 of 2
Cadmium	0.25	*	5	<0.5	0 of 2[2]	*	0 of 2
Chromium VI	3.4	7.5	30	<1.5	0 of 2	0 of 2	0 of 2
Lead	1.2	7.5	10	<5.0	0 of 2[2]	0 of 2	0 of 2
Mercury	0.07	0.75	1	<1	0 of 2[2]	0 of 2[2]	0 of 2
Selenium	*	*	*	<3.0	*	*	*
Boron	*	*	1,000	774 – 1,081	*	*	1 of 2
Copper	30	*	30	<7.0	0 of 2	*	0 of 2
Nickel	4	15	20	<2.0	0 of 2	0 of 2	0 of 2
Zinc	100	75	100	<3.0	0 of 2	0 of 2	0 of 2
Total Cyanide	**10**	*	10	**20 to 140**	**2 of 2**	*	**2 of 2**
Phenol	8	*	0.5	<150	0 of 2[2]		
Sulphate (mg/l)	*	187.5	200	458 - 616	*	**2 of 2**	**2 of 2**
Total Petroleum Hydrocarbons	*	7.5	10	<10	*	0 of 2[2]	0 of 2
Anthracene	0.1	*	10,000	<0.013	0 of 2	*	0 of 2
Benzo(a)pyrene	0.00017	0.0075	0.01	<0.016	0 of 2[2]	0 of 2[2]	0 of 2[2]
Benzo(b+k) fluoranthene	**0.017**	*	0.5 (b) 0.05 (k)	<0.018 – 0.031	**1 of 2[2]**	*	0 of 2[2]
Benzo(ghi) perylene\ Indeno(1,2,3-cd)pyrene	0.00082	*	0.05 (benzo) 0.05 (ind)	<0.011	0 of 2[2]	*	0 of 2[2]
Fluoranthene	**0.0063**	*	1	**0.024 – 0.107**	**2 of 2[2]**	*	0 of 2
Naphthalene	2	*	1	<0.1	0 of 2	*	0 of 2
Benzene	10	0.75	1	<5.0	0 of 2	0 of 2[2]	0 of 2[2]
Toluene	10	525	10	<5.0	0 of 2	0 of 2	0 of 2
Ethylbenzene	*	*	10	<5.0	*	*	0 of 2
Xylenes	10	*	10	<5.0	0 of 2	*	0 of 2
Hardness (mg/l $CaCO_3$)	*	*	*	1,507 – 2,229	*	*	*

Contaminant	AA-EQS (µg/l)	GTV (µg/l)	IGV (µg/l)	Measured range (µg/l)	No. of samples exceeding AA-EQS	No. of samples exceeding GTV	No. of samples exceeding IGV
Ammoniacal Nitrogen as N	*	65	*	710 - 780	*		
pH	*	*	≥6.5 and ≤9.5	7.55 – 7.62	*	*	0 of 2

1. * = No values defined or given.
2. Laboratory limit of detection greater than assessment criteria.

Table 6.7. Standard Water Supply Pipe Assessment

Test Group[1]	Testing Required?	PE threshold (mg/kg)	Metal Pipes / Barrier Pipe	Laboratory Detection Limit (mg/kg)	Testing UKAS accredited Y/N	Maximum concentration at proposed pipeline depth[2] (mg/kg)	Maximum site concentration[3] (mg/kg)	Locations and depths where concentrations exceed proposed pipeline threshold.
Total BTEX & MTBE		**0.1**	**Pass**	0.005	Y	0.019	0.019	No exceedances
EC5–EC10 aliphatic and aromatic hydrocarbons		**2**	**Pass**	0.1	Y	<0.1	0.1	No exceedances
EC10-EC16 aliphatic and aromatic hydrocarbons		**10**	**Pass**	0.2, 4	Y	<4 to 13	13	WS-14 (0 to 1.0mbgl)
EC16-EC40 aliphatic and aromatic hydrocarbons		**500**	**Pass**	<7	Y	<7 to 1,834	1,834	WS-18 (1.0 to 2mbgl)
Phenols		**2**	**Pass**	0.1	Y	0.1	<0.1	No exceedances
Corrosive	**Conductivity** **Redox** **pH**	**Pass**	**Note[4]**	N/A N/A N/A	N	N/A	12.32 mS Not measured 7.25	No exceedances

[1] Tests Groups as per Appendix G of UKWIR Guidance.

[2] Water pipes are normally laid 0.75-1.35 metres below finished ground level.

[3] State if liquid free product is present in soil or groundwater.

[4] Threshold: For wrapped steel, corrosive if pH<7 and conductivity >400 µs/cm. For wrapped ductile iron corrosive if pH<5, Eh not neutral and conductivity >400 µs/cm. For copper, corrosive if pH<5 or>8 and Eh positive.

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Ground Investigations Ireland

Galway Port

Land Development Agency

Ground Investigation Report

October 2024

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Ground Investigations Ireland Ltd. present the results of the fieldworks and laboratory testing in accordance with the specification and related documents provided by or on behalf of the client The possibility of variation in the ground and/or groundwater conditions between or below exploratory locations or due to the investigation techniques employed must be taken into account when this report and the appendices inform designs or decisions where such variation may be considered relevant. Ground and/or groundwater conditions may vary due to seasonal, man-made or other activities not apparent during the fieldworks and no responsibility can be taken for such variation. The data presented and the recommendations included in this report and associated appendices are intended for the use of the client and the client's geotechnical representative only and any duty of care to others is excluded unless approved in writing.

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CONTENTS

APPENDICES

1.0 Preamble

On the instructions of TOBIN Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., between July and September 2024 at the site of the proposed development in Galway Port, Galway City.

2.0 Overview

2.1. Background

It is proposed to construct a new development with associated services, access roads and car parking at the proposed site. At the time of the assessment the site was largely vacant with open paved (predominantly concrete) areas. The central section was occupied by the City Direct Bus offices and maintenance area. The northern section of the site was in use a contractor's compound for an adjacent construction site. The site is bounded to the west by the Lough Atalia Road and to the north and east by Lough Atalia. The southern site boundary is demarcated by the main roadway into the port. The proposed construction is likely to be comprised of piled foundations. The proposed layout of structures or proposed heights of structures was not known at the time of writing this report.

2.2. Purpose and Scope

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Carry out 15 No. Trial Pits to a maximum depth of 4.00m BGL
- Carry out 9 No. Cable Percussion boreholes to a maximum depth of 6.80m BGL
- Carry out 9 No. Rotary Core Boreholes to a maximum depth of 14.00m BGL
- Installation of 3 No. Groundwater monitoring wells
- Geotechnical & Environmental Laboratory testing
- Report with recommendations

3.0 Subsurface Exploration

3.1. General

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling.

The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015.

3.2. Trial Pits

The trial pits were excavated using a 13T tracked excavator at the locations shown in the exploratory hole location plan in Appendix 1. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The trial pits were sampled, logged and photographed by a Geotechnical Engineer/Engineering Geologist prior to backfilling with arisings. Notes were made of any services, inclusions, pit stability, groundwater encountered and the characteristics of the strata encountered and are presented on the trial pit logs which are provided in Appendix 2 of this Report.

3.3. Cable Percussion Boreholes

The Cable Percussion Boreholes were drilled using a Dando 2000 drilling rig with regular in-situ testing and sampling undertaken to facilitate the production of geotechnical logs and laboratory testing.
The standard method of boring in soil for site investigation is known as the Cable Percussion method. It consists of using a Shell in non cohesive soils and a clay cutter in cohesive soils, both operated on a wire cable. Very hard soils, boulders and other hard obstructions are broken up by chiselling and the fragments removed with the Shell. Where ground conditions made it necessary, the borehole was lined with 200mm diameter steel casing. While the use of the Cable Percussion method of boring gives the maximum data on soil conditions, some mixing of laminated soil is inevitable. For this reason, thin lenses of granular material may not be noticed. Disturbed samples were taken from the boring tools at suitable depths, so that there is a representative sample at the top of each change in stratum and thereafter at regular intervals down the borehole until the next stratum was encountered. The disturbed samples were then sealed and sent to the laboratory where they were visually examined to confirm the description of the relevant strata.
Standard Penetration Tests were carried out in the boreholes. The results of these tests, together with the depths at which the tests were taken are shown on the accompanying borehole records. The test consists of a thick wall sampler tube, 50mm external diameter, being driven into the soil by a monkey weighing 63.5kg and with a free drop of 760mm. For gravels and glacial till the driving shoe was replaced by a solid 60º cone. The Standard Penetration Test number referred to as the ‘N’ value is the number of blows required to drive the tube 300mm, after an initial penetration of 150mm. The number gives a guide to the consistency of the soil and can also be used to estimate the relative strength/density at the depth of the test and also to estimate the bearing capacity and compressibility of the soil. The cable percussion with rotary borehole logs are provided in Appendix 3 of this Report.

3.4. Rotary Boreholes

The rotary coring was carried out by a track mounted Comacchio 450 rig at the locations shown on the location plan in Appendix 1. The rotary boreholes were completed from the ground surface.
The Comacchio 450 is equipped with rubber tracks which allow for short travel on pavement surfaces avoiding any damage to the surface. The Comacchio 450 utilises a triple tube core barrel system operated

using a wireline drilling process. The outer barrel is rotated by the drill rods and at its lower end, carries the coring bit. The inner barrel is mounted on a swivel so that it does not rotate during the process. The third barrel or liner is placed within the second one to retain the core intact and to preserve as much as possible the fabric of the drilling stratum. The core is cut by the coring bit and passes to the inner liner. The core is brought up to the surface within the inner barrel on a small diameter wire rope or line attached to the "overshoot" recovery tool which is then placed into a core box in order of recovery. A drilling fluid, typically air mist or water flush is passed from the surface through hollow drill rods to the drill bit and is used to cool the drill bit. Temporary casing is used in some situations to support unstable ground or to seal off fissures or voids.

It should be noted that the rotary coring can only achieve limited recovery in overburden, particularly granular or weakly cemented strata due to the flushing medium washing away the cohesive fraction during coring. The recovery achieved, where required is noted on the borehole logs and core photographs are provided to allow assessment of the core recovered. The cable percussion with rotary borehole logs are provided in Appendix 3 of this Report.

3.5. Surveying

The exploratory hole locations have been recorded using a KQ GEO Technologies KQ-M8 System which records the coordinates and elevation of the locations to ITM as required by the project specification. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

3.6. Groundwater Monitoring Installations

Groundwater Monitoring Installations were installed upon the completion of selected boreholes to enable sampling and the determination of the equilibrium groundwater level. The typical groundwater monitoring installation consists of a 50mm uPVC/HDPE slotted pipe with a pea gravel response zone and bentonite seal installed to the Engineers specification. Where required the standpipe is sealed with a gas tap and finished with a durable steel cover fixed in place with a concrete surround. The installation details are provided on the exploratory hole logs in the appendices of this Report.

3.7. Laboratory Testing

Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design.

Environmental & Chemical testing as required by the specification, including the Rilta Suite, pH and sulphate testing was carried out by Element Materials Technology Laboratory in the UK. The Rilta suite testing includes both Solid Waste and Leachate Waste Acceptance Criteria.

Rock strength testing including Point Load (Is_{50}) and Unconfined Compressive Strength (UCS) testing was carried out in Geotechnical and Soil Testing Services Ltd in the Meath

The results of the completed laboratory testing are included in Appendix 4 of this Report.

4.0 Ground Conditions

4.1. General

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered were relatively consistent across the site and generally comprised;

- Surfacing
- Made Ground
- Possible Made Ground
- Bedrock

SURFACING: Concrete or tarmacadam surfacing was encountered at the majority of the exploratory hole locations. Concrete was encountered to a maximum depth of 0.03m BGL. Tarmacadam was encountered to a maximum depth of 0.05m BGL. Where concrete or tarmacadam was absent crushed rock FILL was encountered to a maximum depth of 0.90m BGL.

MADE GROUND: Made Ground deposits were encountered beneath the Surfacing or Crushed Rock Fill and were present to a depth of up to 9.45m BGL. These deposits were described generally as *clayey sandy subangular to subrounded fine to coarse Gravel with medium cobble content and rare fragments of metal, brick, ceramic, timber, concrete, plastic to grey angular Cobbles and Boulders with a lot of slightly clayey sandy angular Gravel.*

POSSIBLE MADE GROUND DEPOSITS: Possible made ground deposits were encountered beneath the Made Ground in BH1-03, BH1-05, BH1-08 and BH1-09 and were described as *light brown slightly sandy slightly gravelly silty CLAY with low cobble content.*

BEDROCK: The rotary core boreholes recovered two bedrock types across the site. The first rock type encountered was a *strong to very strong foliated dark greenish grey fine to coarse grained METAGABBRO.* The rock appears to have a gneissose structure at most core locations. This is typical of the Grampian Metagabbro and Orthogneiss Suite, which is noted on the Geological Survey Ireland's (GSI) geological mapping of the site. The second rock type encountered was a *strong to very strong massive pink/red/brown stained grey fine to coarse grained GRANITE.* This is typical of the Murvey Granite which is noted to the west of the site on the GSI's mapping.

The depth to bedrock varied from 5.80m BGL in BH1-04 to 9.45m BGL in BH1-09. The total core recovery is good, typically 100% with some of the uppermost runs dropping to 90%. The SCR and RQD both are relatively poor in the upper weathered zone, often recovered as non-intact, however both indices show an increase with depth in each of the boreholes.

4.2. Groundwater

Groudnwater was encountered during the cable percussion drilling of BH1-05 at a depth of 6.30m BGL. Groundwater was not encounter during the excavation of the trial pits. Water strikes cannot be accurately identified during rotary drilling as water is added as part of the drilling process. It should be noted that the exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the time of year, rainfall, nearby construction and other factors. For this reason, standpipes were installed in BH1-02, BH1-03 and BH1-09 to allow the equilibrium groundwater level to be determined. The groundwater monitoring is included in Appendix 5 of this Report.

4.3. Laboratory Testing

4.3.1. Environmental Laboratory Testing

A number of samples were analysed for a suite of parameters which allows for the assessment of the sampled material in terms of total pollutant content for classification of materials as *hazardous* or *non-hazardous*. The suite also allows for the assessment of the sampled material in terms of suitability for placement at licenced landfills (inert, stable non-reactive, hazardous etc.). The parameter list for the suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

The suite also includes those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

As part of the suite a leachate is generated from the solid sample which is analysed for antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, chloride, fluoride, soluble sulphate, sulphide, phenols, dissolved organic carbon (DOC) and total dissolved solids (TDS).

While the laboratory report provides a comparison with the waste acceptance criteria limits it does not provide a waste classification of the material sampled nor does it comment on any potentially hazardous properties of the materials tested. The possibility for contamination, not revealed by the testing undertaken should be borne in mind particularly where Made Ground deposits are present or the previous site use or location indicate a risk of environmental variation. The waste classification report is included under the cover of a separate report by Ground Investigations Ireland.

4.3.2. Rock Laboratory Testing

The rock testing carried out on samples recovered from the boreholes reported Unconfined Compressive Strength (UCS) values ranging between 20.20 and 129.30 MPa while the point load testing gave Is50 values ranging between 2.22 to 8.28 MPa. These results correlate to the strength descriptions ranging

between of strong to very strong and confirming the variability of this stratum and the descriptions on the logs.

The results from the completed laboratory testing are included in Appendix 4 of this report.

5.0 Recommendations & Conclusions

5.1. General

The recommendations given and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between exploratory hole locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes. Limited information has been provided at the ground investigation stage and any designs based on the recommendations or conclusions should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory hole logs.

5.2. Foundations

Due to the presence of made ground across the site, pile foundations are recommended for the proposed structures. The type, size and depth of the pile foundations should be confirmed by a specialist piling contractor based on the loading from the proposed building. The floor slab is recommended be suspended and also supported on the building piles.

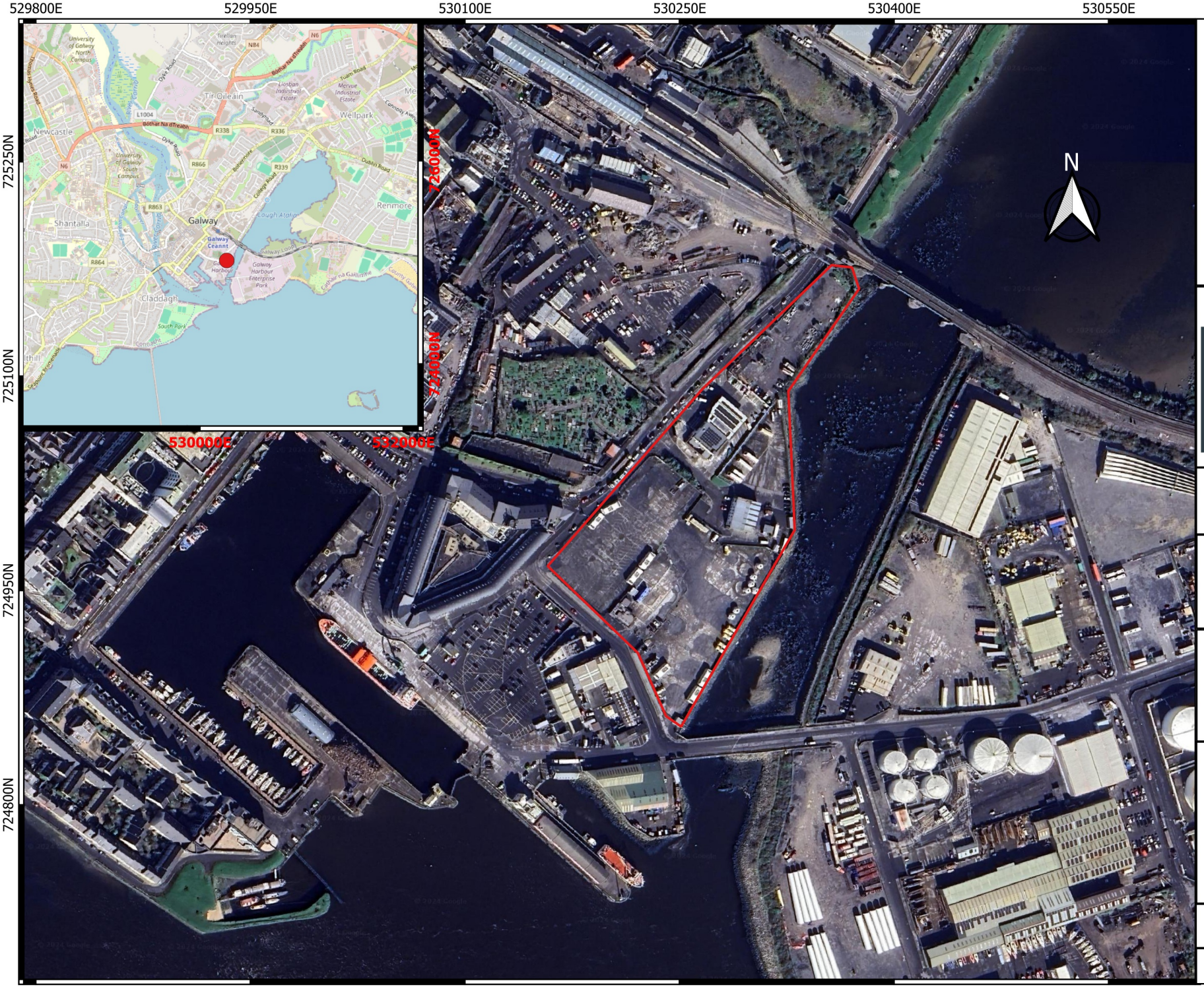
5.3. Excavations

Short term temporary excavations in the cohesive deposits will remain stable for a limited time only and will require to be appropriately battered or the sides supported if the excavation is below 1.25m BGL or is required to permit man entry. Excavations in the Made Ground will require to be appropriately battered or the sides supported due to the low strength of these deposits. The groundwater and stability noted on the trial pit logs should be consulted when determining the most appropriate construction methods for excavations.

Any waste material to be removed off site should be disposed of to a suitably licenced landfill. The environmental testing completed during the ground investigation is reported under the cover of a separate GII Waste Classification Report.

The recommendations provided in this report should be verified in the design of the proposed buildings, using the full details of the loading conditions and taking into consideration the allowable tolerable settlements/movements that the building can accommodate. The founding strata should be inspected and verified by a suitably qualified engineer prior to construction of the building foundations.

APPENDIX 1 - Site Location Plan



Client:

LDA

Project Code:
13885-06-24

Project Title:
Galway Port

Drawing Title:
Figure 1 Site Location

GROUND INVESTIGATIONS IRELAND
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0 50 100 150 m

Drawn By:	Date:
BS	02-08-2024

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Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:

LDA

0 20 40 60 m

Project Title:
Galway Port

Drawing Title:
Figure 2 Borehole Locations

GII Project Reference:
13885-06-24

Drawn By: BS

Date: 15-08-2024

Indicative Site Boundary

Borehole

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Client:

LDA

0 20 40 60 m

Project Title:
Galway Port

Drawing Title:
Figure 3 Trial Pit Locations

GII Project Reference:
13885-06-24

Drawn By: BS

Date: 15-08-2024

Indicative Site Boundary

Trial Pit

APPENDIX 2 – Trial Pit Records

Ground Investigations Ireland Ltd
www.gii.ie

Site Galway Port, Co. Galway			**Trial Pit Number** TP1-01
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.30m x 2.40m x 2.50m (L x W x D)	**Ground Level (mOD)** 4.14	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530229.2 E 724918.6 N	**Dates** 09/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.50)	MADE GROUND: grey slightly sandy angular fine to coarse Gravel		
				3.64	0.50			
					(0.30)	MADE GROUND: brownish grey clayey sandy subangular to subrounded fine to coarse Gravel with medium cobble content and rare fragments of plastic		
0.70	B			3.34	0.80			
1.00-2.00	ES				(0.40)	MADE GROUND: dark grey slightly clayey sandy angular Gravel with high cobble and medium cobble content with rare fragments of plastic		
				2.94	1.20			
1.50	B				(1.30)	MADE GROUND: dark grey angular Cobbles and Boulders with a lot of slightly clayey sandy angular Gravel		
2.00-2.50	ES					Obstruction - Presumed boulder		
				1.64	2.50	Terminated at 2.50m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall spalling.
Trial pit terminated at 2.50m BGL due to obstruction
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-01

Ground Investigations Ireland Ltd
www.gii.ie

Site Galway Port, Co. Galway			**Trial Pit Number** TP1-02
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.30m x 2.00m x 2.60m (L x W x D)	**Ground Level (mOD)** 4.22	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530254.5 E 724937.9 N	**Dates** 09/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES			4.14	(0.08) 0.08	CONCRETE		
					(0.52)	MADE GROUND: brownish grey clayey sandy angular to subangular fine to coarse Gravel with high cobble content and rare fragments of red brick		
1.00 1.00-2.00	B ES			3.62	0.60	MADE GROUND: grey Cobbles and Boulders with some slightly sandy clayey Gravel		
2.00 2.00-2.60	B ES				(2.00)			
				1.62	2.60	Obstruction - Presumed boulder Terminated at 2.60m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sdiewall collapse.
Trial pit terminated at 2.60m BGL due to obstruction
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP02

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-03
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.10m x 2.00m x 3.10m (L x W x D)	**Ground Level (mOD)** 5.11	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530205.9 E 724946.8 N	**Dates** 10/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.12)	CONCRETE		
				4.99	0.12	MADE GROUND: grey slightly sandy angular fine to coarse Gravel		
					(0.28)			
				4.71	0.40	MADE GROUND: dark grey clayey sandy subangular to subrounded fine to coarse Gravel with low cobble content and rare fragments of red brick		
					(0.40)			
				4.31	0.80	MADE GROUND: greyish brown Cobbles and Boulders with some clayey sandy Gravel		
1.00-2.00	ES				(0.70)			
1.20	B							
				3.61	1.50	MADE GROUND: greyish brown slightly clayey slightly sandy subangular to subrounded fine to coarse Gravel with medium cobble content		
2.00-3.00	ES							
2.20	B				(1.60)			
						Obstruction - Presumed boulder		
				2.01	3.10	Terminated at 3.10m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall spalling.
Trial pit terminated at 3.10m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-03

Ground Investigations Ireland Ltd
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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-04
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.40m x 2.00m x 2.90m (L x W x D)	**Ground Level (mOD)** 5.02	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530191.8 E 724960.2 N	**Dates** 11/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.18)	CONCRETE		
				4.84	0.18			
					(0.22)	MADE GROUND: grey slightly sandy angular fine to coarse Gravel		
				4.62	0.40			
						MADE GROUND: greyish brown sandy gravelly Clay with medium cobble and high boulder content and occasional fragments of plastic		
					(0.80)			
1.00 1.00-2.00	B ES							
				3.82	1.20			
						MADE GROUND: dark brown and grey Cobbles and Boulders with some gravelly Clay and occasional fragments of plastic and metal		
					(0.70)			
				3.12	1.90			
						MADE GROUND: dark brown slightly sandy gravelly Clay with high cobble and boulder content		
2.00 2.00-2.90	B ES							
					(1.00)			
						Obstruction - Presumed boulder		
				2.12	2.90			
						Terminated at 2.90m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall spalling.
Trial pit terminated at 2.90m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-04

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-05
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.50m x 2.20m x 3.70m (L x W x D)	**Ground Level (mOD)** 5.12	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530215 E 724962.4 N	**Dates** 10/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.16)	CONCRETE		
				4.96	0.16	MADE GROUND: grey slightly sandy angular fine to coarse Gravel with medium cobble content		
					(0.44)			
0.60	B			4.52	0.60	MADE GROUND: dark grey slightly clayey sandy angular to subangular fine to coarse Gravel with medium cobble and boulder content		
					(0.30)			
1.00-2.00	ES			4.22	0.90	MADE GROUND: greyish brown Cobbles and Boulders with some clayey sandy Gravel		
1.80	B				(1.90)			
2.00-3.00	ES							
				2.32	2.80	MADE GROUND: greyish brown slightly clayey slightly sandy subangular to subrounded fine to coarse Gravel with medium cobble content		
3.00-3.70	ES				(0.90)			
						Obstruction - Presumed boulder		
				1.42	3.70	Terminated at 3.70m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall spalling.
Trial pit terminated at 3.70m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-05

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-06
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.30m x 2.10m x 3.00m (L x W x D)	**Ground Level (mOD)** 4.89	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530252.1 E 724983.1 N	**Dates** 10/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.30)	MADE GROUND: grey slightly sandy angular fine to coarse Gravel		
				4.59	0.30			
					(0.20)	CONCRETE		
				4.39	0.50			
						MADE GROUND: brown sandy gravelly Clay with medium cobble content and occasional fragments of red brick and plastic		
1.00 1.00-2.00	B ES				(1.00)			
				3.39	1.50			
						MADE GROUND: brown sandy gravelly Clay with medium cobble content		
2.00 2.00-3.00	B ES				(1.50)			
						Obstruction - Presumed boulder		
				1.89	3.00			
						Terminated at 3.00m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall collapse.
Trial pit terminated at 3.00m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-06

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-07
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.30m x 2.00m x 2.70m (L x W x D)	**Ground Level (mOD)** 4.68	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530274.8 E 724951.4 N	**Dates** 09/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES			4.60	(0.08) 0.08	CONCRETE		
				4.43	(0.17) 0.25	MADE GROUND: grey clayey slightly clayey slightly sandy angular to subangular fine to coarse Gravel with medium cobble and boulder content		
0.50	B				(0.35)	MADE GROUND: brown slightly sandy gravelly Clay with medium cobble and boulder content with occasional fragments of red brick, ceramic and plastic		
				4.08	0.60			
				3.98	(0.10) 0.70	CONCRETE		
					(0.30)	MADE GROUND: brownish grey COBBLES and BOULDERS with some clayey sandy Gravel		
1.00-2.00	ES			3.68	1.00	MADE GROUND: dark grey clayey sandy angular to subangular fine to coarse Gravel with high cobble and boulder content		
1.50	B				(1.70)			
2.00-2.70	ES							
						Obstruction - Presumed boulder		
				1.98	2.70	Terminated at 2.70m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall spalling.
Trial pit terminated at 2.70m BGL due to obstruction
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-07

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-08
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.10m x 2.10m x 3.60m (L x W x D)	**Ground Level (mOD)** 5.39	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530248.8 E 725002.4 N	**Dates** 11/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.15)	CONCRETE		
				5.24	0.15	MADE GROUND: grey Cobbles with some sandy Gravel		
					(0.30)			
				4.94	0.45	TARMAC		
				4.86	(0.08) 0.53			
						MADE GROUND: brownish grey Cobbles and Boulders with some clayey sandy angular to subangular fine to coarse Gravel with rare fragments of red brick and shell		
1.00-2.00	ES				(0.97)			
1.20	B							
				3.89	1.50	MADE GROUND: brownish grey Cobbles and Boulders with a little clayey sandy angular to subangular fine to coarse Gravel with rare fragments of red brick and shell		
2.00-3.00	ES							
2.20	B							
					(2.10)			
3.00-3.60	ES							
						Obstruction - Presumed boulder		
				1.79	3.60	Terminated at 3.60m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall spalling.
Trial pit terminated at 3.60m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-08

Ground Investigations Ireland Ltd
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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-09
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.20m x 2.10m x 3.20m (L x W x D)	**Ground Level (mOD)** 4.98	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530268.4 E 724999.9 N	**Dates** 11/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.16)	CONCRETE		
				4.82	0.16	MADE GROUND: grey sandy angular to subangular fine to coarse Gravel		
					(0.34)			
				4.48	0.50	MADE GROUND: dark grey Cobbles and Boulders with some sandy gravelly Clay		
					(0.80)			
1.00-2.00	ES							
				3.68	1.30	MADE GROUND: dark grey Cobbles and Boulders with some slightly sandy very clayey subangular to subrounded fine to coarse Gravel		
1.50	B				(0.50)			
				3.18	1.80	MADE GROUND: grey slightly sandy clayey subangular to subrounded fine to coarse Gravel with high cobble and low boulder content		
2.00-3.00	ES							
					(1.40)			
2.60	B							
				1.78	3.20	Terminated at 3.20m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall collapsing
Trial pit terminated at 3.60m BGL due to sidewall collapse.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-09

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-10
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.20m x 2.00m x 4.00m (L x W x D)	**Ground Level (mOD)** 5.20	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530226.8 E 725024.1 N	**Dates** 11/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES			5.15	0.05	MADE GROUND: Grey sandy angular to subangular fine to coarse Gravel		
					(0.15)			
				5.00	0.20	CONCRETE		
						MADE GROUND: grey slightly clayey sandy angular to subangular fine to coarse Gravel with low cobble content		
					(0.50)			
				4.50	0.70	MADE GROUND: Brown slightly sandy gravelly Clay with many fragments of red brick, metal, shell, timber and plastic		
0.80	B							
1.00-2.00	ES							
					(1.00)			
				3.50	1.70	MADE GROUND: Brown slightly sandy gravelly Clay with occasional fragments of red brick, metal, shell, timber and plastic		
2.00-3.00	ES							
2.60	B							
					(2.30)			
3.00-4.00	ES							
						Obstruction - Presumed boulder		
				1.20	4.00			

Plan

Remarks

No groundwater encountered
Trial pit stable.
Trial pit complete at 4.00m BGL.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-10

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-11
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.60m x 2.30m x 1.70m (L x W x D)	**Ground Level (mOD)** 5.55	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530251.6 E 725017.4 N	**Dates** 11/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.13)	CONCRETE		
				5.42	0.13	MADE GROUND: grey slightly sandy angular fine to coarse Gravel		
					(0.27)			
				5.15	0.40	TARMAC		
				5.05	(0.10) 0.50	MADE GROUND: brownish grey slightly sandy clayey subangular to subrounded fine to coarse Gravel		
0.80	B							
1.00-1.70	ES				(1.20)			
						Obstruction - Presumed boulder		
				3.85	1.70	Terminated at 1.70m		

Plan

Remarks

No groundwater encountered
Trial pit stable.
Trial pit terminated at 1.70m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-11

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-12
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.00m x 2.00m x 3.60m (L x W x D)	**Ground Level (mOD)** 5.08	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530304.1 E 725022.4 N	**Dates** 11/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.18)	CONCRETE		
				4.90	0.18	MADE GROUND: grey sandy angular to subangular fine to coarse Gravel		
					(0.22)			
				4.68	0.40	MADE GROUND: dark grey Cobbles and Boulders with some slightly sandy clayey angular to subangular fine to coarse Gravel		
					(0.80)			
1.00 1.00-2.00	B ES							
				3.88	1.20	MADE GROUND: brown slightly sandy gravelly Clay with medium cobble and boulder content		
2.00-3.00	ES							
					(2.40)			
2.50	B							
3.00-3.60	ES							
						Obstruction - Presumed boulder		
				1.48	3.60	Terminated at 3.60m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall collapsing
Trial pit terminated at 3.60m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-12

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-13
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.30m x 2.10m x 2.80m (L x W x D)	**Ground Level (mOD)** 5.87	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530312.8 E 725053.3 N	**Dates** 12/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.15)	CONCRETE		
				5.72	0.15	MADE GROUND: grey sandy angular to subangular fine to coarse Gravel		
					(0.20)			
				5.52	0.35	MADE GROUND: dark grey Cobbles and Boulders with much sandy gravelly Clay		
0.50	B							
1.00-2.00	ES							
					(2.45)			
2.00-2.80	ES							
						Obstruction - presumed boulder		
				3.07	2.80	Terminated at 2.80m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall spalling.
Trial pit terminated at 2.80m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-13

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-14
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.40m x 2.20m x 3.20m (L x W x D)	**Ground Level (mOD)** 5.40	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530313.9 E 725093.2 N	**Dates** 12/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES			5.32	(0.08) 0.08	CONCRETE		
					(0.22)	MADE GROUND: grey sandy angular to subangular fine to coarse Gravel		
				5.10	0.30	MADE GROUND: brown slightly sandy clayey subangular to subrounded fine to coarse Gravel with medium cobble and boulder content and occasional fragments of red brick, concrete and plastic.		
0.60	B							
1.00-2.00	ES							
					(2.90)			
2.00	B							
2.00-2.80	ES							
				2.20	3.20	Obstruction - presumed boulder Terminated at 3.20m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall spalling.
Trial pit terminated at 3.20m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-13

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Site Galway Port, Co. Galway			**Trial Pit Number** TP1-15
Machine : 13T Excavator **Method :** Trial Pit	**Dimensions** 3.00m x 2.00m x 2.60m (L x W x D)	**Ground Level (mOD)** 5.07	**Client** The Land Development Agency Ireland	**Job Number** 13885-06-24
	Location 530352.3 E 725155.3 N	**Dates** 12/07/2024	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	ES				(0.30)	MADE GROUND: grey sandy angular to subangular fine to coarse Gravel		
				4.77	0.30	MADE GROUND: brown slightly sandy clayey subangular to subrounded fine to coarse Gravel with low cobble and boulder content		
					(0.60)			
				4.17	0.90	MADE GROUND: dark grey slightly sandy gravelly Clay with occasional fragments of red brick, concrete and plastic		
1.00 1.00-2.00	B ES							
					(1.70)			
2.00-2.80	ES							
						Obstruction - presumed boulder		
				2.47	2.60	Terminated at 2.60m		

Plan

Remarks

No groundwater encountered
Trial pit unstable. Sidewall spalling.
Trial pit terminated at 3.20m BGL due to obstruction. Presumed boulder.
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	SB	13885-06-24.TP1-15

Galway Port – Trial Pit Photographs

TP1-01

TP1-01

Galway Port – Trial Pit Photographs

TP1-01

TP1-01

Galway Port – Trial Pit Photographs

TP1-02

TP1-02

Galway Port – Trial Pit Photographs

TP1-02

TP1-02

Galway Port – Trial Pit Photographs

TP1-03

TP1-03

Galway Port – Trial Pit Photographs

TP1-03

TP1-03

Galway Port – Trial Pit Photographs

TP1-04

TP1-04

Galway Port – Trial Pit Photographs

TP1-04

TP1-04

Galway Port – Trial Pit Photographs

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Galway Port – Trial Pit Photographs

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TP1-05

Galway Port – Trial Pit Photographs

TP1-06

TP1-06

Galway Port – Trial Pit Photographs

TP1-06

TP1-06

Galway Port – Trial Pit Photographs

TP1-07

TP1-07

Galway Port – Trial Pit Photographs

TP1-07

TP1-07

Galway Port – Trial Pit Photographs

TP1-08

TP1-08

Galway Port – Trial Pit Photographs

TP1-08

TP1-08

Galway Port – Trial Pit Photographs

TP1-09

TP1-09