codling wind park

Environmental Impact Assessment Report

Volume 4

Appendix 19.4 Site Investigation (2018)

Dublin Port Berth 47a– Ground Investigation

Client:	L&M Keating
Client's Representative:	RPS
Report No.:	18-1287
Date:	December 2018
Status:	Final for Issue

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APPENDICES

Document Control Sheet

Report No.:		18-1287			
Project Title:		Dublin Port Berth 47a			
Client:		L&M Keating			
Client's Representative:		RPS			
Revision:	A00	**Status:**	Final for Issue	**Issue Date:**	17 December 2018
Prepared by:		**Reviewed by:**		**Approved by:**	
 Sean Ross BSc MSc		 Colm Hurley BSc FGS		 Darren O'Mahony BSc MSc MIEI	

The works were conducted in accordance with:

UK Specification for Ground Investigation 2nd Edition, published by ICE Publishing (2012)

British Standards Institute (2015) BS 5930:2015, Code of practice for site investigations.

BS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing.

Geotechnical Society of Ireland (2016), Specification & Related Documents for Ground Investigation in Ireland

METHODS OF DESCRIBING SOILS AND ROCKS

Soil and rock descriptions are based on the guidance in BS5930:2015, The Code of Practice for Site Investigation.

Abbreviations used on exploratory hole logs	
U	Nominal 100mm diameter undisturbed open tube sample (thick walled sampler)
UT	Nominal 100mm diameter undisturbed open tube sample (thin walled sampler)
P	Nominal 100mm diameter undisturbed piston sample
B	Bulk disturbed sample
LB	Large bulk disturbed sample
D	Small disturbed sample
C	Core sub-sample (displayed in the Field Records column on the logs)
L	Liner sample from dynamic sampled borehole
W	Water sample
ES / EW	Soil sample for environmental testing / Water sample for environmental testing
SPT (s)	Standard penetration test using a split spoon sampler (small disturbed sample obtained)
SPT (c)	Standard penetration test using 60 degree solid cone
x,x/x,x,x,x	Blows per increment during the standard penetration test. The initial two values relate to the seating drive (150mm) and the remaining four to the 75mm increments of the test length. The length achieved is stated (mm) for any test increment less than 75mm
N=X	SPT blow count 'N' given by the summation of the blows 'X' required to drive the full test length (300mm)
N=X/Z	Incomplete standard penetration test where the full test length was not achieved. The blows 'X' represent the total blows for the given test length 'Z' (mm)
V VR	Shear vane test (borehole) Hand vane test (trial pit) Shear strength stated in kPa V: undisturbed vane shear strength VR: remoulded vane shear strength
dd/mm/yy: 1.0 dd/mm/yy: dry	Date & water level at the borehole depth at the end of shift and the start of the following shift
▽	Water strike: initial depth of strike
▼	Water strike: depth water rose to
Abbreviations relating to rock core – reference Clause 36.4.4 of BS 5930: 2015	
TCR (%)	Total Core Recovery: Ratio of rock/soil core recovered (both solid and non-intact) to the total length of core run.
SCR (%)	Solid Core Recovery: Ratio of solid core to the total length of core run. Solid core has a full diameter, uninterrupted by natural discontinuities, but not necessarily a full circumference and is measured along the core axis between natural fractures.
RQD (%)	Rock Quality Designation: Ratio of total length of solid core pieces greater than 100mm to the total length of core run.
FI	Fracture Index: Number of natural discontinuities per metre over an indicated length of core of similar intensity of fracturing.
NI	Non Intact: Used where the rock material was recovered fragmented, for example as fine to coarse gravel size particles.
AZCL	Assessed zone of core loss: The estimated depth range where core was not recovered.
DIF	Drilling induced fracture: A fracture of non-geological origin brought about by the rock coring.
(xxx/xxx/xxx)	Spacing between discontinuities (minimum/average/maximum).

Dublin Port Berth 47a

1 AUTHORITY

On the instructions of RPS Consulting Engineers, ("the Client's Representative"), acting on the behalf of L&M Keating ("the Client"), a ground investigation was undertaken at the above location to provide geotechnical and environmental information for input to the design and construction of a proposed bridge structure.

This report details the work carried out both on site and in the chemical testing laboratories; it contains a description of the site and the works undertaken, the exploratory hole logs and the laboratory test results.

All information given in this report is based upon the ground conditions encountered during the site investigation works, and on the results of the laboratory and field tests performed. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations, and water conditions between or below exploratory holes. It should be noted that groundwater levels usually vary due to seasonal and/or other effects and may at times differ to those recorded during the investigation. No responsibility can be taken for conditions not encountered through the scope of work commissioned, for example between exploratory hole points, or beneath the termination depths achieved.

This report was prepared by Causeway Geotech Ltd for the use of the Client and the Client's Representative in response to a particular set of instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded.

2 SCOPE

The extent of the investigation, as instructed by the Client's Representative, included boreholes, trial pits, soil sampling, groundwater sampling, surface water sampling, groundwater monitoring, laboratory testing, and the preparation of a factual report on the findings.

3 DESCRIPTION OF SITE

As shown on the site location plan in Appendix A, the works were conducted on the south quays in Ringsend at a site accessed off Pigeon House Road, adjacent to Ecocem Ireland concrete manufacturing facility.

4 SITE OPERATIONS

4.1 Summary of site works

Site operations, which were conducted between 19th and 22nd November 2018, comprised:

- five boreholes by rotary drilling methods;
- a standpipe installation in five boreholes; and
- eight machine dug trial pits

The exploratory holes and in-situ tests were located as instructed by the Client's Representative, as shown on the exploratory hole location plan in Appendix A.

4.2 Boreholes

Five boreholes (BH01-BH05) were put to their completion by rotary drilling techniques only. The boreholes were completed using a Beretta T44 rotary rig.

Symmetrix-cased full hole rotary percussive drilling techniques were employed to advance the boreholes to scheduled depth. Environmental samples were taken at standard intervals as specified by the Client's Representative.

Appendix B presents the borehole logs.

4.3 Standpipe installations

A groundwater monitoring standpipe was installed in BH01 – BH05.

Details of the installations, including the depth range of the response zone, are provided in Appendix B on the individual borehole logs.

4.4 Trial Pits

Eight trial pits (TP01–TP08) were excavated using an 8t tracked excavator fitted with a 600mm wide bucket, to depths of 2.80 – 3.60m.

Environmental samples were taken at intervals as specified by the Client's Representative.

Any water strikes encountered during excavation were recorded along with any changes in their levels as the excavation proceeded. The stability of the trial pit walls was noted on completion.

Appendix C presents the trial pit logs with photographs of the pits and arising provided in Appendix D. an equivalent CBR value is relatively conservative.

4.5 Surveying

The as-built exploratory hole positions were surveyed following completion of site operations by a Site Engineer from Causeway Geotech. Surveying was carried out using a Trimble R6 GPS system employing VRS and real time kinetic (RTK) techniques.

The plan coordinates (Irish National Grid) and ground elevation (mOD Malin) at each location are recorded on the individual exploratory hole logs. The exploratory hole plan presented in Appendix A shows these as-built positions.

4.6 Groundwater monitoring

Following completion of site works, groundwater monitoring was conducted on two rounds. Ground water monitoring was carried out using a water interface probe.

The monitoring records are presented in Table 2 of Section 6.3.

Five data loggers and one barometric logger were installed on the 3rd of December 2018 in BH01 – BH05 and left for a period of one week to measure groundwater levels.

5 LABORATORY WORK

5.1 Environmental laboratory testing of soils

Environmental testing, as specified by the Client's Representative was conducted on selected environmental soil and water samples by Chemtest at its laboratory in Newmarket, Suffolk.

Testing was carried out according to the following suites:

- RPS Soil Testing Suite A
- RPS Soil Testing Suite B
- RPS Soil Testing Suite C
- RPS Soil Testing Suite D
- RPS Soil Testing Suite E
- RPS Groundwater/Surface water Suite
- Leachate Analysis

Results of environmental laboratory testing are presented in Appendix E.

6 GROUND CONDITIONS

6.1 General geology of the area

Published geological mapping indicate the superficial deposits underlying the site comprise Made ground and marine deposits. These deposits are underlain by sandstone of the Sherwood Sandstone Formation.

6.2 Ground types encountered during investigation of the site

A summary of the ground types encountered in the exploratory holes is listed below, in approximate stratigraphic order:

- **Topsoil:** encountered in TP02 – TP08 with a thickness of 100 – 300mm. Fragments of red brick and concrete were encountered at ground level in TP08.
- **Made Ground (fill):** reworked sandy gravel/gravelly sand fill with fragments of brick and concrete encountered at all trial pit locations. It was encountered across the site to depths of 0.5 -1.0m, except in TP01 which encountered fill down to 3.6m containing metal fragments, plastic bags, wire, pipe and ceramics.
- **Made Ground (general fill):** reworked sandy gravel/gravelly sand fill with shell fragments, encountered at all exploratory locations. General fill was encountered to a maximum depth of 7.00m in BH01. However, it must be noted that all boreholes were drilled via symmetrix methods with no recovery, therefore descriptions are based on driller's interpretations of the flush returns only and are only an approximation.
- **Marine deposits:** typically, sandy gravels/gravelly sands with pockets of silty clay/clayey silt interspersed throughout. Sand and gravel deposits were encountered at all borehole locations to a maximum depth of 20.00m in BH01 and BH02. Note this was the maximum extent of the borehole so the thickness of the strata was unable to be determined at these locations. BH01 and BH03 encountered soft silt to a depth of 7.00m and 9.00m in BH03 and BH01 respectively. BH03 – BH05 encountered firm silty clay to a depth of 20.00m.

6.3 Groundwater

Groundwater was encountered during rotary drilling and trial pit excavations as water strikes as shown in Table 1 below.

Table 1: Groundwater monitoring

GI Ref.	Water Level (mbgl)	Comments
BH02	4.50	Strike
BH05	6.00	Strike
TP02	2.50	Strike

Details of the individual groundwater strikes, along with any relative changes in levels as works proceeded, are presented on the exploratory hole logs for each location.

Groundwater was not noted during drilling at any of the other borehole locations. However, it should be noted that the casing used in supporting the borehole walls during drilling may have sealed out any/additional groundwater strikes and the possibility of encountering groundwater during excavation works should not be ruled out.

Groundwater was not noted during excavation of any of the other trial pits.

Subsequent groundwater monitoring of the standpipe installations recorded water levels as shown in Table 2.

Table 2 Groundwater monitoring

GI Ref.	Water Level (mbgl)	
	03/12/2018	10/12/2018
BH01	2.70	4.10
BH02	1.92	3.10
BH03	2.26	3.50
BH04	2.18	3.73
BH05	1.99	3.54

Seasonal variation in groundwater levels should also be factored into design considerations, and continued monitoring of the five installed standpipes will give an indication of the seasonal variation in groundwater level.

7 REFERENCES

Geotechnical Society of Ireland (2016), Specification & Related Documents for Ground Investigation in Ireland

IS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing.

BS 1377: 1990: Methods of test for soils for civil engineering purposes. British Standards Institution.

BS 5930: 2015: Code of practice for ground investigations. British Standards Institution.

BS EN 1997-2: 2007: Eurocode 7 - Geotechnical design - Part 2 Ground investigation and testing. British Standards Institution.

BS EN ISO 14688-1:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 1 Identification and description.

BS EN ISO 14688-2:2018: Geotechnical investigation and testing. Identification and classification of soil. Part 2 Principles for a classification.

CAUSEWAY GEOTECH

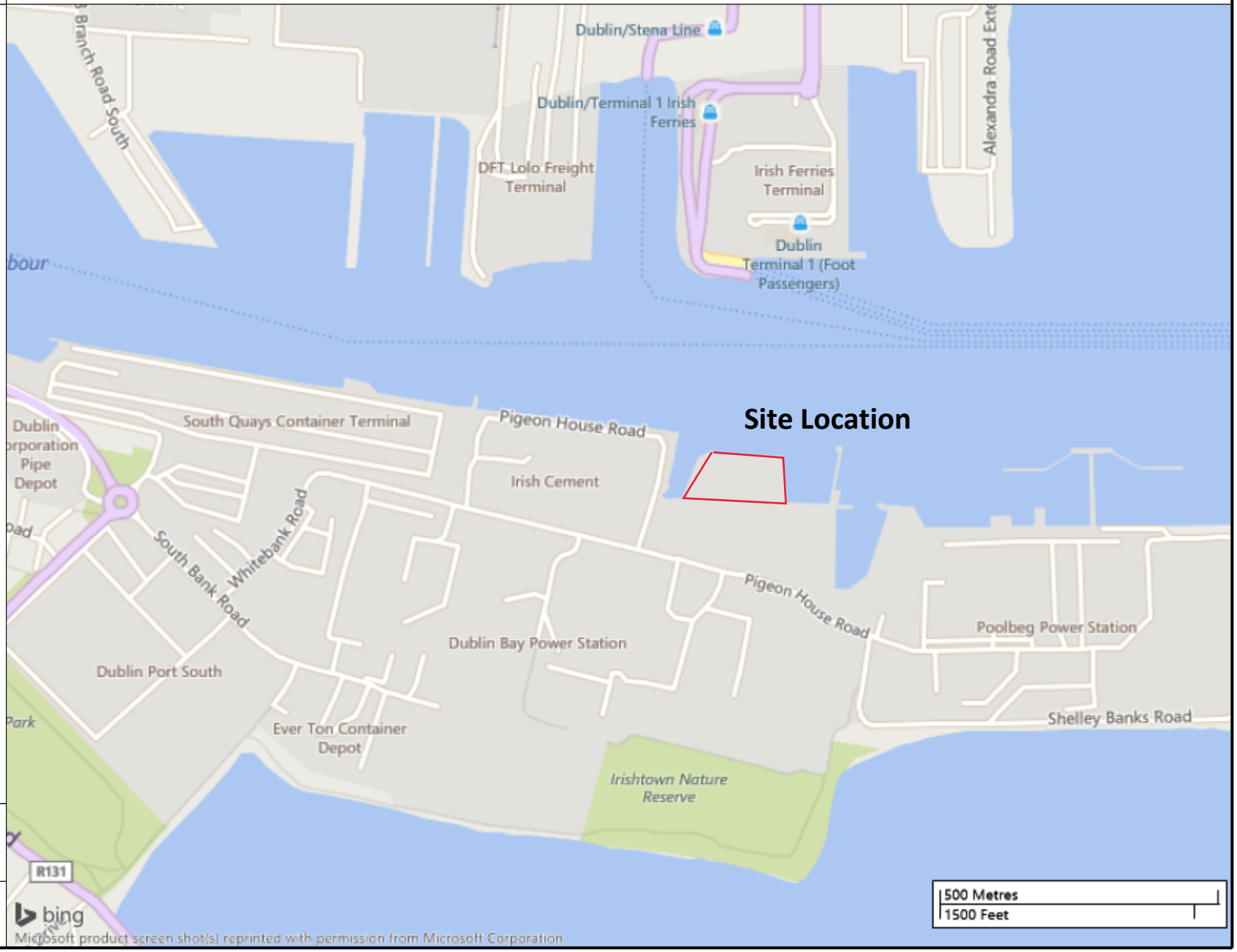
APPENDIX A

SITE AND EXPLORATORY HOLE LOCATION PLANS

CAUSEWAY GEOTECH

Project No.:	18-1287	**Client:**	L&M Keating
Project Name:	Dublin Port Berth 47A	**Client's Representative:**	RPS

Legend Key



Title:

Site Location Plan

Last Revised:	**Scale:**
27/11/2018	1:10000

CAUSEWAY GEOTECH

Project No.:	18-1287	**Client:**	L&M Keating
Project Name:	Dublin Port Berth 47A	**Client's Representative:**	RPS

Legend Key

- Locations By Type - RO
- Locations By Type - TP

Title:
Exploratory Hole Location Plan

Last Revised:	**Scale:**
17/12/2018	1:1000

CAUSEWAY GEOTECH

APPENDIX B

BOREHOLE LOGS

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Rotary Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287

Project Name: Dublin Port Berth 47A

Borehole No.: BH01

Coordinates: 320151.85 E, 233889.07 N

Client: L&M Keating

Sheet 1 of 2

Client's Representative: RPS

Scale: 1:50

Driller: JR

Ground Level: 3.68 mOD

Dates: 21/11/2018 - 21/11/2018

Logger: TH

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
						(0.50)		MADE GROUND: Grey SILT (Driller's description)
0.50	ES1				3.18	0.50		MADE GROUND: Greyish brown sandy angular to subangular fine to coarse GRAVEL. Sand is fine to coarse (Driller's description)
1.00	ES2							
2.00	ES3							
3.00	ES4							
						(6.50)		
4.00	ES5							
5.00	ES6							
6.00	ES7							
7.00	ES8				-3.32	7.00		Soft grey SILT (Driller's description)
						(2.00)		
					-5.32	9.00		Brown sandy subangular to subrounded fine to medium GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are subangular. (Driller's description)

Water | Backfill

Remarks

No groundwater encountered

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	150

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Rotary Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287

Project Name: Dublin Port Berth 47A

Borehole No.: BH01

Coordinates: 320151.85 E, 233889.07 N

Client: L&M Keating

Sheet 2 of 2

Client's Representative: RPS

Scale: 1:50

Ground Level: 3.68 mOD

Dates: 21/11/2018 - 21/11/2018

Driller: JR

Logger: TH

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
						(6.00)		Brown sandy subangular to subrounded fine to medium GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are subangular. (Driller's description)
					-11.32	15.00		Brown sandy subangular fine to coarse GRAVEL. Sand is fine to coarse. (Driller's description)
						(1.00)		
					-12.32	16.00		Brown sandy subangular fine to coarse GRAVEL. Sand is fine to coarse. (Driller's description)
						(4.00)		
					-16.32	20.00		End of Borehole at 20.00m

Water: Backfill

10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5

Remarks

No groundwater encountered

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	150

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Symmetrix Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287

Project Name: Dublin Port Berth 47A

Borehole No.: BH02

Coordinates: 320222.60 E, 233883.57 N

Client: L&M Keating

Sheet 1 of 2

Client's Representative: RPS

Scale: 1:50

Ground Level: 3.05 mOD

Dates: 20/11/2018 - 20/11/2018

Driller: JR

Logger: SR

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
0.50	ES1							MADE GROUND: Brown gravelly fine coarse SAND. Gravel is subangular to subrounded fine to coarse of mixed lithologies. (Driller's description)
1.00	ES2							
2.00	ES3					(4.00)		
3.00	ES4							
4.00	ES5				-0.95	4.00		
				Water Strike at 4.50m				Black gravelly fine SAND. Gravel is subangular to subrounded fine to coarse of mixed lithologies (Driller's description)
5.00	ES6							
6.00	ES7							
7.00	ES8					(6.00)		
					-6.95	10.00		

Water

Backfill

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5

Remarks

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
4.50			

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	150

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Symmetrix Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A
Coordinates: 320222.60 E 233883.57 N	**Client:** L&M Keating
	Client's Representative: RPS
Ground Level: 3.05 mOD	**Dates:** 20/11/2018 - 20/11/2018

Borehole No.: **BH02**

Sheet 2 of 2

Scale: 1:50

Driller: JR

Logger: SR

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
						(4.00)		Brown sandy subangular to subrounded coarse GRAVEL of mixed lithologies. (Driller's description)
					-10.95	14.00		Brown and grey COBBLES and BOULDERS (Driller's description)
						(1.00)		
					-11.95	15.00		Brown sandy subangular to subrounded fine to coarse GRAVEL. Sand is fine to coarse. (Driller's description)
						(5.00)		
					-16.95	20.00		End of Borehole at 20.00m

Water

Backfill

10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5

Remarks

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	150

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Rotary Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287

Project Name: Dublin Port Berth 47A

Borehole No.: BH03

Coordinates: 320229.66 E, 233831.60 N

Client: L&M Keating

Sheet 1 of 2

Client's Representative: RPS

Scale: 1:50

Driller: JR

Ground Level: 3.23 mOD

Dates: 21/11/2018 - 21/11/2018

Logger: TH

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
0.50	ES1							MADE GROUND: Light brown fine to coarse SAND (Driller's description)
1.00	ES2							
2.00	ES3					(5.00)		
3.00	ES4							
4.00	ES5							
5.00	ES6				-1.77	5.00		Soft grey slightly sandy SILT. Sand is fine to coarse. (Driller's description)
6.00	ES7					(2.00)		
7.00	ES8				-3.77	7.00		Grey slightly sandy subangular to subrounded fine to medium GRAVEL. Sand is fine to coarse. (Driller's description)
						(1.70)		
					-5.47	8.70		Brown sandy subangular to subrounded fine to coarse GRAVEL. Sand is fine to coarse.

Water | Backfill

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5

Remarks

No groundwater encountered

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	150

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Rotary Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287

Project Name: Dublin Port Berth 47A

Borehole No.: BH03

Coordinates: 320229.66 E, 233831.60 N

Client: L&M Keating

Sheet 2 of 2

Client's Representative: RPS

Scale: 1:50

Ground Level: 3.23 mOD

Dates: 21/11/2018 - 21/11/2018

Driller: JR

Logger: TH

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
						(5.80)		Brown sandy subangular to subrounded fine to coarse GRAVEL. Sand is fine to coarse.
					-11.27	14.50		Brownish grey slightly sandy subangular to subrounded fine to medium GRAVEL. Sand is fine to coarse. (Driller's description)
						(4.00)		
					-15.27	18.50		Firm brown silty CLAY (Driller's description)
						(1.50)		
					-16.77	20.00		End of Borehole at 20.00m

Water

Backfill

10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5

Remarks

No groundwater encountered

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	150

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Rotary Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287

Project Name: Dublin Port Berth 47A

Borehole No.: BH04

Coordinates: 320108.33 E, 233830.09 N

Client: L&M Keating

Sheet 1 of 3

Client's Representative: RPS

Scale: 1:50

Ground Level: 3.21 mOD

Dates: 20/11/2018 - 20/11/2018

Driller: GT

Logger: SR

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
						(0.50)		MADE GROUND: Soft to firm grey sandy SILT. Sand is fine to coarse. (Driller's description)
0.50	ES1				2.70	0.50		MADE GROUND: Brown very sandy subangular to subrounded fine to coarse GRAVEL of mixed lithologies. Sand is fine to coarse. (Driller's description)
1.00	ES2							
2.00	ES3							
3.00	ES4					(5.50)		
4.00	ES5							
5.00	ES6							
6.00	ES7				-2.80	6.00		Brown very sandy subangular to subrounded fine GRAVEL of mixed lithologies. Sand is fine to medium. (Driller's description)
7.00	ES8							
						(4.50)		

Water | Backfill

Remarks
No groundwater encountered

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	200

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Rotary Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287

Project Name: Dublin Port Berth 47A

Borehole No.: BH04

Coordinates: 320108.33 E, 233830.09 N

Client: L&M Keating

Sheet 2 of 3

Client's Representative: RPS

Scale: 1:50

Ground Level: 3.21 mOD

Dates: 20/11/2018 - 20/11/2018

Driller: GT

Logger: SR

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
								Brown very sandy subangular to subrounded fine GRAVEL of mixed lithologies. Sand is fine to medium. (Driller's description)
					-7.30	10.50		Brownish grey slightly sandy subangular to subrounded fine to coarse GRAVEL with low boulder content. Sand is fie to coarse. Boulders are subangular. (Driller's description)
						(8.50)		
					-15.80	19.00		Firm brownish grey silty CLAY (Driller's description)
						(1.00)		
					-16.80	20.00		

Water | Backfill

10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5

Remarks

No groundwater encountered

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	200

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Project No.:	Project Name:	Borehole No.:
18-1287	Dublin Port Berth 47A	BH04
Coordinates:	**Client:**	Sheet 3 of 3
320108.33 E	L&M Keating	
233830.09 N	**Client's Representative:** RPS	**Scale:** 1:50
Ground Level: 3.21 mOD	**Dates:** 20/11/2018 - 20/11/2018	**Driller:** GT
		Logger: SR

Method	Plant Used	Top	Base
Rotary Drilling	Beretta T44	0.00	20.00

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
		20.00		20-11-2018				End of Borehole at 20.00m		

20.5
21.0
21.5
22.0
22.5
23.0
23.5
24.0
24.5
25.0
25.5
26.0
26.5
27.0
27.5
28.0
28.5
29.0
29.5

Remarks
No groundwater encountered

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	200

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Rotary Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A
Coordinates: 320183.55 E 233857.59 N	**Client:** L&M Keating
	Client's Representative: RPS
Ground Level: 3.15 mOD	**Dates:** 19/11/2018 - 19/11/2018

Borehole No.: BH05

Sheet 1 of 2

Scale: 1:50

Driller: GT

Logger: SR

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
						(0.50)		MADE GROUND: Silty sandy GRAVEL with fragments of glass. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. (Driller's description)
0.50	ES1				2.65	0.50		MADE GROUND: Brown gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mixed lithologies. (Driller's description)
1.00	ES2							
						(1.50)		
2.00	ES3				1.15	2.00		MADE GROUND: Brownish grey fine SAND (Driller's description)
3.00	ES4							
4.00	ES5					(4.00)		
5.00	ES6							
6.00	ES7			Water Strike at 6.00m	-2.85	6.00		Brownish grey slightly gravelly fine SAND. Gravel is subangular to subrounded fine to coarse of mixed lithologies. (Driller's description)
7.00	ES8							

Water

Backfill

Remarks

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)
6.00			

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	200

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

Method	Plant Used	Top	Base
Rotary Drilling	Beretta T44	0.00	20.00

Project No.: 18-1287

Project Name: Dublin Port Berth 47A

Borehole No.: BH05

Coordinates: 320183.55 E, 233857.59 N

Client: L&M Keating

Sheet 2 of 2

Client's Representative: RPS

Scale: 1:50

Ground Level: 3.15 mOD

Dates: 19/11/2018 - 19/11/2018

Driller: GT

Logger: SR

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description
								Brownish grey slightly gravelly fine SAND. Gravel is subangular to subrounded fine to coarse of mixed lithologies. (Driller's description)
						(9.00)		
					-11.85	15.00		Brown slightly sandy coarse GRAVEL with low boulder content. Sand is fine to coarse. Gravel is of mixed lithologies. Boulders are subrounded. (Driller's description)
						(4.20)		
					-16.05	19.20		Firm greyish brown silty CLAY (Driller's description)
						(0.80)		
					-16.85	20.00		End of Borehole at 20.00m

Water

Backfill

10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5

Remarks

Terminated at scheduled depth.

Water Strikes

Struck at (m)	Casing to (m)	Time (min)	Rose to (m)

Water Added

From (m)	To (m)

Casing Details

To (m)	Diam (mm)
20.00	200

Chiselling Details

From (m)	To (m)	Time (hh:mm)

CAUSEWAY GEOTECH

APPENDIX C

TRIAL PIT LOGS

CAUSEWAY GEOTECH

Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A		**Trial Pit No.:** TP01
Co-ordinates: 320156.99 E 233888.43 N	**Client:** L&M Keating		Sheet 1 of 1
Method: Trial Pitting	**Client's Representative:** RPS		**Scale:** 1:25
Plant: Tracked Excavator	**Ground Level:** 3.41 mOD	**Date:** 20/11/2018	**Logger:** TH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.60)		MADE GROUND: Dark grey sandy subangular to subrounded fine to coarse GRAVEL of mixed lithologies with medium cobble content. Sand is fine to coarse. Cobbles are subangular of mixed lithologies.	
0.50	ES1		2.81	0.60		MADE GROUND: Brown very sandy angular to subangular GRAVEL of mixed lithologies. Sand is fine to coarse. Cobbles are subangular of mixed lithologies.	
1.00	ES2		2.21	(0.60) 1.20		MADE GROUND: Brown very gravelly fine to coarse SAND with waste material including metal fragments, plastic bags, wire, pipe, ceramic and concrete blocks. (C and D waste)	
2.00	ES3		1.11	(1.10) 2.30		MADE GROUND: Dark brown clayey fine to coarse SAND white waste material including metal and bricks. (C and D waste)	
3.00	ES4			(1.30)			
3.60	ES5		-0.19	3.60		End of trial pit at 3.60m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks
No groundwater encountered

Terminated on engineer's instruction

Water Strikes:	
Struck at (m):	Remarks:

Stability: Stable

Width: 1.20

Length: 3.60

CAUSEWAY GEOTECH

Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A		**Trial Pit No.:** TP02
Co-ordinates: 320125.78 E 233840.80 N	**Client:** L&M Keating		Sheet 1 of 1
Method: Trial Pitting	**Client's Representative:** RPS		**Scale:** 1:25
Plant: 3T Tracked Excavator	**Ground Level:** 3.08 mOD	**Date:** 20/11/2018	**Logger:** TH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
			2.98	(0.10) 0.10		TOPSOIL: Brown slightly gravelly fine to medium SAND with roots	
0.50	ES1			(0.70)		MADE GROUND: Brown sandy angular to subangular fine to coarse GRAVEL with medium cobble content including fragments of brick and concrete. Sand is fine to coarse. Cobbles are angular of mixed lithologies including brick and concrete.	
1.00	ES2		2.28	0.80		MADE GROUND: Brown gravelly fine to medium SAND with medium cobble content. Gravel is subrounded fine to medium of mixed lithologies. Cobbles are subrounded of mixed lithologies.	
				(1.10)			
2.00	ES3		1.18	1.90		MADE GROUND: Brown very gravelly fine to coarse SAND with shell fragments. Gravel is subangular fine to coarse of mixed lithologies.	
		Water strike at 2.50m		(0.90)			▼
2.80	ES4		0.28	2.80		End of trial pit at 2.80m	

Remarks

Terminated due to pit walls collapsing

Water Strikes:

Struck at (m):	Remarks:
2.50	Water strike at 2.50m

Stability: Unstable

Width: 1.20

Length: 3.10

CAUSEWAY GEOTECH

	Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A	**Trial Pit No.:** TP03
	Co-ordinates: 320151.83 E	**Client:** L&M Keating	Sheet 1 of 1
Method: Trial Pitting	233835.27 N	**Client's Representative:** RPS	**Scale:** 1:25
Plant: Tracked Excavator	**Ground Level:** 3.05 mOD	**Date:** 20/11/2018	**Logger:** TH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.20)		TOPSOIL: Brown slightly gravelly fine to coarse SAND with roots	
			2.85	0.20		MADE GROUND: Brownish grey very sandy subangular to subrounded fine to coarse GRAVEL with medium cobble content. Sand is fine to coarse. Cobbles are angular of mixed lithologies including concrete and brick.	
0.50	ES1			(0.80)			
1.00	ES2		2.05	1.00		MADE GROUND: Brown very gravelly fine to coarse SAND with low cobble content. Sand is fine to coarse. Gravel is subrounded to rounded fine to coarse of mixed lithologies with many shell fragments.	
2.00	ES3			(1.80)		*2.00m to 2.80m: Brownish grey medium to coarse SAND*	
			0.25	2.80		End of trial pit at 2.80m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks
No groundwater encountered

Terminated due to pit walls collapsing

Water Strikes:	
Struck at (m):	Remarks:

Stability: Unstable

Width: 1.30

Length: 3.40

CAUSEWAY GEOTECH

Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A		**Trial Pit No.:** **TP04**
Co-ordinates: 320183.56 E	**Client:** L&M Keating		Sheet 1 of 1
Method: Trial Pitting	233837.24 N	**Client's Representative:** RPS	**Scale:** 1:25
Plant: Tracked Excavator	**Ground Level:** 2.99 mOD	**Date:** 20/11/2018	**Logger:** TH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
			2.89	(0.10) 0.10		TOPSOIL: Brown slightly gravelly slightly silty fine to coarse SAND with roots	
				(0.50)		MADE GROUND: Brown sandy angular to subangular GRAVEL of mixed lithologies with high cobble content. Sand is fine to coarse. Cobbles are angular of mixed lithologies including brick and concrete.	
0.50	ES1		2.39	0.60		MADE GROUND: Greyish brown fine to medium SAND with shell fragments	
1.00	ES2						
				(2.20)			
2.00	ES3						
			0.19	2.80		MADE GROUND: Grey silty fine SAND	
				(0.20)			
3.00	ES4		-0.01	3.00		End of trial pit at 3.00m	

Remarks
No groundwater encountered

Terminated due to pit walls collapsing

Water Strikes:	
Struck at (m):	Remarks:

Stability: Unstable

Width: 1.20

Length: 3.50

CAUSEWAY GEOTECH

Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A		**Trial Pit No.:** TP05
Co-ordinates: 320183.50 E 233886.88 N	**Client:** L&M Keating		Sheet 1 of 1
Method: Trial Pitting	**Client's Representative:** RPS		**Scale:** 1:25
Plant: Tracked Excavator	**Ground Level:** 3.02 mOD	**Date:** 20/11/2018	**Logger:** TH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
			2.97	(0.05) 0.05		TOPSOIL: Brown slightly gravelly fine to coarse SAND with rootlets	
				(0.45)		MADE GROUND: Brown very sandy angular to subangular fine to coarse GRAVEL with medium cobble content. Sand is fine to coarse. Cobbles are angular of mixed lithologies including red brick and concrete.	
0.50	ES1		2.52	0.50		MADE GROUND: Brown slightly gravelly fine to coarse SAND with many shell fragments. Gravel is subangular to subrounded fine to coarse of mixed lithologies.	
1.00	ES2			(1.30)			
			1.22	1.80		MADE GROUND: Grey silty fine SAND	
2.00	ES3			(1.10)			
			0.12	2.90		End of trial pit at 2.90m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks
No groundwater encountered

Terminated due to pit walls collapsing

Water Strikes:	
Struck at (m):	Remarks:

Stability: Unstable

Width: 1.20

Length: 3.80

CAUSEWAY GEOTECH

Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A		**Trial Pit No.:** **TP06**
Co-ordinates: 320211.50 E	**Client:** L&M Keating		Sheet 1 of 1
Method: Trial Pitting	233875.31 N	**Client's Representative:** RPS	**Scale:** 1:25
Plant: Tracked Excavator	**Ground Level:** 3.08 mOD	**Date:** 20/11/2018	**Logger:** TH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.15)		TOPSOIL: Brown slightly gravelly slightly silty fine to coarse SAND with roots	
			2.93	0.15		MADE GROUND: Brownish grey very sandy angular to subangular fine to coarse GRAVEL of mixed lithologies with medium cobble content. Sand is fine to coarse. Cobbles are angular of mixed lithologies including brick and concrete.	
0.50	ES1			(0.55)			
			2.38	0.70		MADE GROUND: Brownish grey gravelly fine to coarse SAND with low cobble content. Gravel is subrounded to rounded fine to coarse of mixed lithologies Cobbles are subrounded of mixed lithologies.	
1.00	ES2			(0.80)			
			1.58	1.50		MADE GROUND: Brown fine to medium SAND	
				(0.50)			
2.00	ES3		1.08	2.00		MADE GROUND: Grey fine SAND	
				(1.00)			
3.00	ES4		0.08	3.00		End of trial pit at 3.00m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks
No groundwater encountered

Terminated due to pit walls collapsing

Water Strikes:

Struck at (m):	Remarks:

Stability: Unstable

Width: 1.40

Length: 3.50

CAUSEWAY GEOTECH

Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A		**Trial Pit No.:** **TP07**
Co-ordinates: 320203.73 E	**Client:** L&M Keating		Sheet 1 of 1
Method: Trial Pitting	233832.81 N	**Client's Representative:** RPS	**Scale:** 1:25
Plant: Tracked Excavator	**Ground Level:** 3.18 mOD	**Date:** 20/11/2018	**Logger:** TH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
			3.08	(0.10) 0.10		TOPSOIL: Brown slightly gravelly silty fine to coarse SAND with roots.	
0.50	ES1			(0.70)		MADE GROUND: Brownish grey sandy angular to subangular fine to coarse GRAVEL of mixed lithologies with medium cobble content. Sand is fine to coarse. Cobbles are angular of mixed lithologies including brick and concrete fragments.	
1.00	ES2		2.38	0.80		MADE GROUND: Brown slightly gravelly fine to medium SAND. Gravel is rounded to subrounded fine to coarse of mixed lithologies.	
				(1.00)			
2.00	ES3		1.38	1.80		MADE GROUND: Brown fine to medium SAND with many shell fragments.	
				(1.20)			
3.00	ES4		0.18	3.00		MADE GROUND: Grey slightly silty fine SAND	
				(0.20)			
			-0.02	3.20		End of trial pit at 3.20m	

Remarks
No groundwater encountered

Terminated due to pit walls collapsing

Water Strikes:	
Struck at (m):	Remarks:

Stability: Unstable

Width: 1.20

Length: 3.60

CAUSEWAY GEOTECH

Project No.: 18-1287	**Project Name:** Dublin Port Berth 47A		**Trial Pit No.:** **TP08**
Co-ordinates: 320212.28 E	**Client:** L&M Keating		Sheet 1 of 1
Method: Trial Pitting	233849.74 N	**Client's Representative:** RPS	**Scale:** 1:25
Plant: Tracked Excavator	**Ground Level:** 3.13 mOD	**Date:** 20/11/2018	**Logger:** TH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
				(0.30)		TOPSOIL: Brown very sandy angular to subangular GRAVEL of mixed lithologies with medium cobble content, fragments of red brick and concrete.	
			2.83	0.30		MADE GROUND: Brown very sandy angular to subangular GRAVEL of mixed lithologies with medium cobble content and fragments of red brick and concrete. Sand is fine to coarse. Cobbles are angular of mixed lithologies.	
0.50	ES1			(0.70)			
1.00	ES2		2.13	1.00		MADE GROUND: Greyish brown fine to medium SAND with shell fragments.	
				(1.80)			
2.00	ES3						
			0.33	2.80		MADE GROUND: Grey silty fine SAND	
				(0.20)			
3.00	ES4		0.13	3.00		End of trial pit at 3.00m	

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Remarks
No groundwater encountered

Terminated due to pit walls collapsing

Water Strikes:	
Struck at (m):	Remarks:

Stability: Unstable

Width: 1.30

Length: 3.60

CAUSEWAY GEOTECH

APPENDIX D

TRIAL PIT PHOTOGRAPHS

TP01

TP01

TP01

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TP02

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CAUSEWAY GEOTECH

APPENDIX E

ENVIRONMENTAL LABORATORY TEST RESULTS

Chemtest
The right chemistry to deliver results
Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.: 18-36593-1

Initial Date of Issue: 28-Nov-2018

Client Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Carin Cornwall
Colm Hurley
Darren O'Mahony
Gabriella Horan
John Cameron
Lucy Newland
Lucy Peaker
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Sean Ross
Stephen Franey
Stephen Watson
Stuart Abraham

Project 18-1287 Dublin Port Company Berth 47a

Quotation No.:	Q18-15154	**Date Received:**	21-Nov-2018
Order No.:		**Date Instructed:**	23-Nov-2018
No. of Samples:	2		
Turnaround (Wkdays):	3	**Results Due:**	27-Nov-2018
Date Approved:	28-Nov-2018		

Approved By:

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36593	18-36593
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		728849	728853
Order No.:			Client Sample Ref.:		ES	ES
			Sample Location:		BH05	BH05
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.50	4.00
			Date Sampled:		19-Nov-2018	19-Nov-2018
			Asbestos Lab:		COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	13	22
pH	U	2010		N/A	11.1	9.4
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	0.66
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.17	0.13
Total Sulphur	U	2175	%	0.010	0.21	0.077
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50
Iron (Total)	N	2430	mg/kg	100	9800	8800
Arsenic	U	2450	mg/kg	1.0	22	10
Barium	U	2450	mg/kg	10	63	13
Beryllium	U	2450	mg/kg	1.0	< 1.0	< 1.0
Cadmium	U	2450	mg/kg	0.10	0.83	0.12
Chromium	U	2450	mg/kg	1.0	17	10
Copper	U	2450	mg/kg	0.50	21	4.2
Mercury	U	2450	mg/kg	0.10	0.15	< 0.10
Nickel	U	2450	mg/kg	0.50	25	12
Lead	U	2450	mg/kg	0.50	67	7.0
Selenium	U	2450	mg/kg	0.20	< 0.20	< 0.20
Vanadium	U	2450	mg/kg	5.0	15	11
Zinc	U	2450	mg/kg	0.50	140	48
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	4.1	0.62
Aliphatic TPH >C5-C6	N	2680	mg/kg	0.010	< 0.010	< 0.010
Aliphatic TPH >C6-C8	N	2680	mg/kg	0.010	< 0.010	< 0.010
Aliphatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	2680	mg/kg	0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	2680	mg/kg	0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	2680	mg/kg	0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	2680	mg/kg	0.10	26	< 0.10
Aliphatic TPH >C35-C44	N	2680	mg/kg	0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	2680	mg/kg	1.0	26	< 1.0
Aromatic TPH >C5-C7	N	2680	mg/kg	0.010	< 0.010	< 0.010
Aromatic TPH >C7-C8	N	2680	mg/kg	0.010	< 0.010	< 0.010
Aromatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	2680	mg/kg	0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	2680	mg/kg	0.10	< 0.10	< 0.10

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36593	18-36593
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		728849	728853
Order No.:			Client Sample Ref.:		ES	ES
			Sample Location:		BH05	BH05
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.50	4.00
			Date Sampled:		19-Nov-2018	19-Nov-2018
			Asbestos Lab:		COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic TPH >C16-C21	N	2680	mg/kg	0.10	1.5	< 0.10
Aromatic TPH >C21-C35	N	2680	mg/kg	0.10	150	< 0.10
Aromatic TPH >C35-C44	N	2680	mg/kg	0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	2680	mg/kg	1.0	160	< 1.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	2.0	180	< 2.0
Naphthalene	N	2700	mg/kg	0.010	0.19	< 0.010
Acenaphthylene	N	2700	mg/kg	0.010	0.19	< 0.010
Acenaphthene	N	2700	mg/kg	0.010	0.010	< 0.010
Fluorene	N	2700	mg/kg	0.010	0.16	< 0.010
Phenanthrene	N	2700	mg/kg	0.010	2.0	< 0.010
Benzo[j]fluoranthene	N	2700	mg/kg	0.010	1.4	< 0.010
Anthracene	N	2700	mg/kg	0.010	0.59	< 0.010
Fluoranthene	N	2700	mg/kg	0.010	3.4	< 0.010
Pyrene	N	2700	mg/kg	0.010	3.6	< 0.010
Benzo[a]anthracene	N	2700	mg/kg	0.010	1.8	< 0.010
Chrysene	N	2700	mg/kg	0.010	0.55	< 0.010
Benzo[b]fluoranthene	N	2700	mg/kg	0.010	2.8	< 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010	1.3	< 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010	2.0	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010	1.1	< 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010	0.25	< 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010	0.85	< 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20	21	< 0.20
Dichlorodifluoromethane	N	2760	µg/kg	1.0	< 1.0	< 1.0
Chloromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0
Vinyl Chloride	U	2760	µg/kg	1.0	< 1.0	< 1.0
Bromomethane	U	2760	µg/kg	20	< 20	< 20
Chloroethane	N	2760	µg/kg	2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	2760	µg/kg	1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Bromochloromethane	N	2760	µg/kg	5.0	< 5.0	< 5.0
Trichloromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	2760	µg/kg	1.0	< 1.0	< 1.0
Tetrachloromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,1-Dichloropropene	N	2760	µg/kg	1.0	< 1.0	< 1.0

Chemtest
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Results - Soil

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36593	18-36593
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		728849	728853
Order No.:			Client Sample Ref.:		ES	ES
			Sample Location:		BH05	BH05
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.50	4.00
			Date Sampled:		19-Nov-2018	19-Nov-2018
			Asbestos Lab:		COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0	< 2.0	< 2.0
Trichloroethene	N	2760	µg/kg	1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	2760	µg/kg	1.0	< 1.0	< 1.0
Dibromomethane	U	2760	µg/kg	1.0	< 1.0	< 1.0
Bromodichloromethane	U	2760	µg/kg	5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10
1,1,2-Trichloroethane	U	2760	µg/kg	10	< 10	< 10
Tetrachloroethene	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,3-Dichloropropane	N	2760	µg/kg	2.0	< 2.0	< 2.0
Dibromochloromethane	N	2760	µg/kg	10	< 10	< 10
1,2-Dibromoethane	U	2760	µg/kg	5.0	< 5.0	< 5.0
Chlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	< 2.0	< 2.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Styrene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Tribromomethane	N	2760	µg/kg	1.0	< 1.0	< 1.0
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Bromobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	< 50
N-Propylbenzene	N	2760	µg/kg	1.0	< 1.0	< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
4-Chlorotoluene	N	2760	µg/kg	1.0	< 1.0	< 1.0
Tert-Butylbenzene	N	2760	µg/kg	1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
Sec-Butylbenzene	N	2760	µg/kg	1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
4-Isopropyltoluene	N	2760	µg/kg	1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
N-Butylbenzene	N	2760	µg/kg	1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	N	2760	µg/kg	50	< 50	< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0

Chemtest
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Results - Soil

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36593	18-36593
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		728849	728853
Order No.:			Client Sample Ref.:		ES	ES
			Sample Location:		BH05	BH05
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.50	4.00
			Date Sampled:		19-Nov-2018	19-Nov-2018
			Asbestos Lab:		COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Hexachlorobutadiene	N	2760	µg/kg	1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	N	2760	µg/kg	2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50	< 0.50
Phenol	U	2790	mg/kg	0.50	< 0.50	< 0.50
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50	< 0.50
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Isophorone	U	2790	mg/kg	0.50	< 0.50	< 0.50
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50	< 0.50
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Naphthalene	U	2790	mg/kg	0.50	< 0.50	< 0.50
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50	< 0.50
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50	< 0.50
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50	< 0.50
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50	< 0.50
Acenaphthylene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Acenaphthene	U	2790	mg/kg	0.50	< 0.50	< 0.50
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50	< 0.50

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Results - Soil

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36593	18-36593
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		728849	728853
Order No.:			Client Sample Ref.:		ES	ES
			Sample Location:		BH05	BH05
			Sample Type:		SOIL	SOIL
			Top Depth (m):		0.50	4.00
			Date Sampled:		19-Nov-2018	19-Nov-2018
			Asbestos Lab:		COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Fluorene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Diethyl Phthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50
4-Nitroaniline	U	2790	mg/kg	0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50
Azobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50
Hexachlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Pentachlorophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50
Phenanthrene	U	2790	mg/kg	0.50	1.8	< 0.50
Anthracene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Carbazole	U	2790	mg/kg	0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50
Fluoranthene	U	2790	mg/kg	0.50	2.1	< 0.50
Pyrene	U	2790	mg/kg	0.50	2.0	< 0.50
Butylbenzyl Phthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50
Benzo[a]anthracene	U	2790	mg/kg	0.50	1.3	< 0.50
Chrysene	U	2790	mg/kg	0.50	1.1	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	U	2790	mg/kg	0.50	1.7	< 0.50
Benzo[k]fluoranthene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Benzo[a]pyrene	U	2790	mg/kg	0.50	1.2	< 0.50
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50	0.93	< 0.50
Resorcinol	U	2920	mg/kg	0.050	< 0.050	< 0.050
Phenol	U	2920	mg/kg	0.050	< 0.050	< 0.050
Cresols	U	2920	mg/kg	0.050	0.10	< 0.050
Xylenols	U	2920	mg/kg	0.050	< 0.050	< 0.050
1-Naphthol	N	2920	mg/kg	0.050	< 0.050	< 0.050
Trimethylphenols	U	2920	mg/kg	0.050	< 0.050	< 0.050
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest
The right chemistry to deliver results
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Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.: 18-36751-1

Initial Date of Issue: 29-Nov-2018

Client Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Carin Cornwall
Colm Hurley
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Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Sean Ross
Stephen Franey
Stephen Watson
Stuart Abraham

Project 18-1287 Dublin Port Berth 47a

Quotation No.: Q18-15154 **Date Received:** 22-Nov-2018

Order No.: **Date Instructed:** 23-Nov-2018

No. of Samples: 13

Turnaround (Wkdays): 4 **Results Due:** 28-Nov-2018

Date Approved: 29-Nov-2018

Approved By:

Details: Robert Monk, Technical Manager

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Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					Chemtest Job No.:	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154					Chemtest Sample ID.:	729504	729506	729508	729511	729513	729518	729520	729521	729523
					Sample Location:	TP01	TP01	TP02	TP03	TP03	TP05	TP05	TP06	TP06
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.0	3.0	0.5	0.5	2.0	0.5	2.0	0.5	2.0
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
ACM Type	U	2192		N/A		-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020		6.0	9.4	8.2	8.3	11	5.8	17	6.2	23
pH	U	2010		N/A		9.8	9.1	9.5	9.6	8.8	9.6	9.4	10.1	9.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40		0.48	1.7	0.91	0.87	1.0	0.97	0.53	0.79	< 0.40
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		0.098	0.10	0.18	0.14	0.38	0.12	0.056	0.41	0.067
Total Sulphur	U	2175	%	0.010		< 0.010	0.082	0.17	0.14	0.064	0.17	0.049	0.21	0.071
Cyanide (Total)	U	2300	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Iron (Total)	N	2430	mg/kg	100		7300	10000	11000	9600	9100	11000	7100	10000	6100
Arsenic	U	2450	mg/kg	1.0		14	13	26	21	14	18	8.8	28	5.3
Barium	U	2450	mg/kg	10		24	28	88	81	22	48	< 10	87	< 10
Beryllium	U	2450	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	U	2450	mg/kg	0.10		0.17	0.57	0.56	0.69	0.17	0.48	< 0.10	0.62	< 0.10
Chromium	U	2450	mg/kg	1.0		11	12	18	15	11	20	8.3	17	7.4
Copper	U	2450	mg/kg	0.50		9.1	24	34	33	8.8	34	3.0	26	1.4
Mercury	U	2450	mg/kg	0.10		< 0.10	< 0.10	0.30	0.17	< 0.10	0.25	< 0.10	0.46	< 0.10
Nickel	U	2450	mg/kg	0.50		15	21	33	24	15	23	9.8	30	7.5
Lead	U	2450	mg/kg	0.50		13	19	120	92	17	110	5.1	100	3.0
Selenium	U	2450	mg/kg	0.20		< 0.20	0.52	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.24	< 0.20
Vanadium	U	2450	mg/kg	5.0		14	17	22	22	16	21	14	27	12
Zinc	U	2450	mg/kg	0.50		36	73	220	300	66	320	24	110	15
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40		3.5	0.59	2.2	3.3	1.5	1.5	< 0.40	3.8	< 0.40
Aliphatic TPH >C5-C6	N	2680	mg/kg	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C6-C8	N	2680	mg/kg	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C8-C10	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	12	< 0.10
Aliphatic TPH >C21-C35	N	2680	mg/kg	0.10		< 0.10	< 0.10	37	22	< 0.10	27	< 0.10	76	< 0.10
Aliphatic TPH >C35-C44	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	2680	mg/kg	1.0		< 1.0	< 1.0	37	22	< 1.0	27	< 1.0	88	< 1.0
Aromatic TPH >C5-C7	N	2680	mg/kg	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C7-C8	N	2680	mg/kg	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C8-C10	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	2680	mg/kg	0.10		< 0.10	< 0.10	2.7	1.8	< 0.10	< 0.10	< 0.10	6.0	< 0.10

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					Chemtest Job No.:	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154					Chemtest Sample ID.:	729504	729506	729508	729511	729513	729518	729520	729521	729523
					Sample Location:	TP01	TP01	TP02	TP03	TP03	TP05	TP05	TP06	TP06
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.0	3.0	0.5	0.5	2.0	0.5	2.0	0.5	2.0
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Aromatic TPH >C21-C35	N	2680	mg/kg	0.10		< 0.10	< 0.10	230	55	< 0.10	82	< 0.10	99	< 0.10
Aromatic TPH >C35-C44	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	2680	mg/kg	1.0		< 1.0	< 1.0	230	57	< 1.0	82	< 1.0	110	< 1.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	2.0		< 2.0	< 2.0	270	78	< 2.0	110	< 2.0	190	< 2.0
Naphthalene	N	2700	mg/kg	0.010		< 0.010	< 0.010	< 0.010	0.11	< 0.010	< 0.010	< 0.010	0.63	< 0.010
Acenaphthylene	N	2700	mg/kg	0.010		< 0.010	< 0.010	< 0.010	0.14	< 0.010	< 0.010	< 0.010	0.17	< 0.010
Acenaphthene	N	2700	mg/kg	0.010		< 0.010	< 0.010	< 0.010	0.31	< 0.010	< 0.010	< 0.010	0.66	< 0.010
Fluorene	N	2700	mg/kg	0.010		< 0.010	< 0.010	< 0.010	0.28	< 0.010	< 0.010	< 0.010	0.74	< 0.010
Phenanthrene	N	2700	mg/kg	0.010		< 0.010	< 0.010	1.5	1.6	< 0.010	< 0.010	< 0.010	4.5	< 0.010
Benzo[j]fluoranthene	N	2700	mg/kg	0.010		< 0.010	< 0.010	0.80	0.73	< 0.010	< 0.010	< 0.010	1.1	< 0.010
Anthracene	N	2700	mg/kg	0.010		< 0.010	< 0.010	0.32	0.27	< 0.010	< 0.010	< 0.010	1.2	< 0.010
Fluoranthene	N	2700	mg/kg	0.010		< 0.010	< 0.010	2.6	2.3	0.25	0.62	< 0.010	4.7	< 0.010
Pyrene	N	2700	mg/kg	0.010		< 0.010	< 0.010	3.1	2.9	0.68	0.86	< 0.010	5.1	< 0.010
Benzo[a]anthracene	N	2700	mg/kg	0.010		< 0.010	< 0.010	1.3	1.2	< 0.010	< 0.010	< 0.010	1.5	< 0.010
Chrysene	N	2700	mg/kg	0.010		< 0.010	< 0.010	1.3	1.2	< 0.010	< 0.010	< 0.010	2.0	< 0.010
Benzo[b]fluoranthene	N	2700	mg/kg	0.010		< 0.010	< 0.010	1.8	1.6	< 0.010	< 0.010	< 0.010	2.2	< 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010		< 0.010	< 0.010	0.60	0.58	< 0.010	< 0.010	< 0.010	0.99	< 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010		< 0.010	< 0.010	1.2	1.1	< 0.010	< 0.010	< 0.010	1.7	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010		< 0.010	< 0.010	0.19	0.55	< 0.010	< 0.010	< 0.010	0.92	< 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010		< 0.010	< 0.010	0.080	0.040	< 0.010	< 0.010	< 0.010	0.020	< 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010		< 0.010	< 0.010	0.85	0.67	< 0.010	< 0.010	< 0.010	1.1	< 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20		< 0.20	< 0.20	15	15	0.93	1.5	< 0.20	28	< 0.20
Dichlorodifluoromethane	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	2760	µg/kg	20		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Chloroethane	N	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	N	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					**Chemtest Job No.:**	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154					**Chemtest Sample ID.:**	729504	729506	729508	729511	729513	729518	729520	729521	729523
					Sample Location:	TP01	TP01	TP02	TP03	TP03	TP05	TP05	TP06	TP06
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.0	3.0	0.5	0.5	2.0	0.5	2.0	0.5	2.0
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Trichloroethene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	U	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	2760	µg/kg	10		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	N	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	N	2760	µg/kg	10		< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	N	2760	µg/kg	50		< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	N	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					Chemtest Job No.:	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154					Chemtest Sample ID.:	729504	729506	729508	729511	729513	729518	729520	729521	729523
					Sample Location:	TP01	TP01	TP02	TP03	TP03	TP05	TP05	TP06	TP06
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.0	3.0	0.5	0.5	2.0	0.5	2.0	0.5	2.0
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
N-Nitrosodimethylamine	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Chemtest
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Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					**Chemtest Job No.:**	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154					**Chemtest Sample ID.:**	729504	729506	729508	729511	729513	729518	729520	729521	729523
					Sample Location:	TP01	TP01	TP02	TP03	TP03	TP05	TP05	TP06	TP06
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.0	3.0	0.5	0.5	2.0	0.5	2.0	0.5	2.0
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Diethyl Phthalate	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	U	2790	mg/kg	0.50		< 0.50	< 0.50	0.81	0.80	< 0.50	< 0.50	< 0.50	0.81	< 0.50
Anthracene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	U	2790	mg/kg	0.50		< 0.50	< 0.50	1.9	1.3	< 0.50	< 0.50	< 0.50	1.2	< 0.50
Pyrene	U	2790	mg/kg	0.50		< 0.50	< 0.50	1.7	1.1	< 0.50	< 0.50	< 0.50	0.96	< 0.50
Butylbenzyl Phthalate	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	U	2790	mg/kg	0.50		< 0.50	< 0.50	1.3	0.73	< 0.50	< 0.50	< 0.50	0.74	< 0.50
Chrysene	U	2790	mg/kg	0.50		< 0.50	< 0.50	1.1	0.72	< 0.50	< 0.50	< 0.50	0.61	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	0.97	< 0.50	< 0.50	< 0.50	0.86	< 0.50
Benzo[k]fluoranthene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	U	2790	mg/kg	0.50		< 0.50	< 0.50	1.2	0.69	< 0.50	< 0.50	< 0.50	0.67	< 0.50
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50		< 0.50	< 0.50	0.88	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
PCB 81	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 77	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 105	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 114	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 118	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 123	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 126	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 156	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 157	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 167	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 169	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
PCB 189	N	2815	mg/kg	0.010		< 0.010		< 0.010		< 0.010	< 0.010			
Total PCBs (12 Congeners)	N	2815	mg/kg	0.12		< 0.12		< 0.12		< 0.12	< 0.12			
Resorcinol	U	2920	mg/kg	0.050		< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Phenol	U	2920	mg/kg	0.050		< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050

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Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729504	729506	729508	729511	729513	729518	729520	729521	729523
			Sample Location:		TP01	TP01	TP02	TP03	TP03	TP05	TP05	TP06	TP06
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.0	3.0	0.5	0.5	2.0	0.5	2.0	0.5	2.0
			Date Sampled:		20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Cresols	U	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Xylenols	U	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1-Naphthol	N	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Trimethylphenols	U	2920	mg/kg	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

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Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729525	729527	729530	729532
			Sample Location:		TP07	TP07	TP08	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.5	2.0	1.0	3.0
			Date Sampled:		20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
ACM Type	U	2192		N/A	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture	N	2030	%	0.020	8.1	21	15	22
pH	U	2010		N/A	10.9	9.1	9.1	9.0
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.69	< 0.40	< 0.40	2.1
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.68	< 0.010	< 0.010	0.074
Total Sulphur	U	2175	%	0.010	0.21	0.038	0.044	0.076
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Iron (Total)	N	2430	mg/kg	100	12000	6200	6400	7400
Arsenic	U	2450	mg/kg	1.0	22	5.5	6.1	6.7
Barium	U	2450	mg/kg	10	72	< 10	< 10	< 10
Beryllium	U	2450	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	U	2450	mg/kg	0.10	0.65	< 0.10	< 0.10	< 0.10
Chromium	U	2450	mg/kg	1.0	22	7.0	7.6	8.3
Copper	U	2450	mg/kg	0.50	32	1.9	1.9	3.0
Mercury	U	2450	mg/kg	0.10	0.19	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	30	8.1	8.0	9.9
Lead	U	2450	mg/kg	0.50	79	3.5	3.1	5.3
Selenium	U	2450	mg/kg	0.20	0.20	< 0.20	< 0.20	< 0.20
Vanadium	U	2450	mg/kg	5.0	31	11	12	13
Zinc	U	2450	mg/kg	0.50	260	15	15	20
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Organic Matter	U	2625	%	0.40	1.7	< 0.40	< 0.40	0.55
Aliphatic TPH >C5-C6	N	2680	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C6-C8	N	2680	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	2680	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C5-C7	N	2680	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C7-C8	N	2680	mg/kg	0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C8-C10	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	2680	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					Chemtest Job No.:	18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154					Chemtest Sample ID.:	729525	729527	729530	729532
					Sample Location:	TP07	TP07	TP08	TP08
					Sample Type:	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.5	2.0	1.0	3.0
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Aromatic TPH >C21-C35	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	2680	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	2680	mg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0
Naphthalene	N	2700	mg/kg	0.010		< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthylene	N	2700	mg/kg	0.010		< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthene	N	2700	mg/kg	0.010		< 0.010	< 0.010	< 0.010	< 0.010
Fluorene	N	2700	mg/kg	0.010		< 0.010	< 0.010	< 0.010	< 0.010
Phenanthrene	N	2700	mg/kg	0.010		1.8	< 0.010	< 0.010	< 0.010
Benzo[j]fluoranthene	N	2700	mg/kg	0.010		0.88	< 0.010	< 0.010	< 0.010
Anthracene	N	2700	mg/kg	0.010		0.31	< 0.010	< 0.010	< 0.010
Fluoranthene	N	2700	mg/kg	0.010		2.6	< 0.010	< 0.010	< 0.010
Pyrene	N	2700	mg/kg	0.010		3.4	< 0.010	< 0.010	< 0.010
Benzo[a]anthracene	N	2700	mg/kg	0.010		1.0	< 0.010	< 0.010	< 0.010
Chrysene	N	2700	mg/kg	0.010		1.4	< 0.010	< 0.010	< 0.010
Benzo[b]fluoranthene	N	2700	mg/kg	0.010		1.9	< 0.010	< 0.010	< 0.010
Benzo[k]fluoranthene	N	2700	mg/kg	0.010		0.74	< 0.010	< 0.010	< 0.010
Benzo[a]pyrene	N	2700	mg/kg	0.010		1.3	< 0.010	< 0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	2700	mg/kg	0.010		0.74	< 0.010	< 0.010	< 0.010
Dibenz(a,h)Anthracene	N	2700	mg/kg	0.010		0.090	< 0.010	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	2700	mg/kg	0.010		1.1	< 0.010	< 0.010	< 0.010
Total Of 16 PAH's	N	2700	mg/kg	0.20		16	< 0.20	< 0.20	< 0.20
Dichlorodifluoromethane	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	2760	µg/kg	20		< 20	< 20	< 20	< 20
Chloroethane	N	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	N	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
Benzene	U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0

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Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729525	729527	729530	729532
			Sample Location:		TP07	TP07	TP08	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.5	2.0	1.0	3.0
			Date Sampled:		20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Trichloroethene	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10	< 10	< 10
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	2760	µg/kg	10	< 10	< 10	< 10	< 10
Tetrachloroethene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	N	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	N	2760	µg/kg	10	< 10	< 10	< 10	< 10
1,2-Dibromoethane	U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	< 50	< 50	< 50
N-Propylbenzene	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	N	2760	µg/kg	50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	N	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0

Chemtest
The right chemistry to deliver results

Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729525	729527	729530	729532
			Sample Location:		TP07	TP07	TP08	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.5	2.0	1.0	3.0
			Date Sampled:		20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
			Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
N-Nitrosodimethylamine	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene	U	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					Chemtest Job No.:	18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154					Chemtest Sample ID.:	729525	729527	729530	729532
					Sample Location:	TP07	TP07	TP08	TP08
					Sample Type:	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.5	2.0	1.0	3.0
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Diethyl Phthalate	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Pentachlorophenol	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Anthracene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Carbazole	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Pyrene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Chrysene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate	N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	U	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50
PCB 81	N	2815	mg/kg	0.010				< 0.010	
PCB 77	N	2815	mg/kg	0.010				< 0.010	
PCB 105	N	2815	mg/kg	0.010				< 0.010	
PCB 114	N	2815	mg/kg	0.010				< 0.010	
PCB 118	N	2815	mg/kg	0.010				< 0.010	
PCB 123	N	2815	mg/kg	0.010				< 0.010	
PCB 126	N	2815	mg/kg	0.010				< 0.010	
PCB 156	N	2815	mg/kg	0.010				< 0.010	
PCB 157	N	2815	mg/kg	0.010				< 0.010	
PCB 167	N	2815	mg/kg	0.010				< 0.010	
PCB 169	N	2815	mg/kg	0.010				< 0.010	
PCB 189	N	2815	mg/kg	0.010				< 0.010	
Total PCBs (12 Congeners)	N	2815	mg/kg	0.12				< 0.12	
Resorcinol	U	2920	mg/kg	0.050		< 0.050	< 0.050	< 0.050	< 0.050
Phenol	U	2920	mg/kg	0.050		< 0.050	< 0.050	< 0.050	< 0.050

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Results - Soil

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					**Chemtest Job No.:**	18-36751	18-36751	18-36751	18-36751
Quotation No.: Q18-15154					**Chemtest Sample ID.:**	729525	729527	729530	729532
					Sample Location:	TP07	TP07	TP08	TP08
					Sample Type:	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.5	2.0	1.0	3.0
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
					Asbestos Lab:	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**					
Cresols	U	2920	mg/kg	0.050		< 0.050	< 0.050	< 0.050	< 0.050
Xylenols	U	2920	mg/kg	0.050		< 0.050	< 0.050	< 0.050	< 0.050
1-Naphthol	N	2920	mg/kg	0.050		< 0.050	< 0.050	< 0.050	< 0.050
Trimethylphenols	U	2920	mg/kg	0.050		< 0.050	< 0.050	< 0.050	< 0.050
Total Phenols	U	2920	mg/kg	0.30		< 0.30	< 0.30	< 0.30	< 0.30

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest
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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.: 18-36777-1

Initial Date of Issue: 30-Nov-2018

Client Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Carin Cornwall
Colm Hurley
Darren O'Mahony
Gabriella Horan
John Cameron
Lucy Newland
Lucy Peaker
Matthew Gilbert
Neil Haggan
Paul Dunlop
Paul McNamara
Sean Ross
Stephen Franey
Stephen Watson
Stuart Abraham

Project 18-1287 Dublin Port Company Berth 47a

Quotation No.:	Q18-15154	**Date Received:**	21-Nov-2018
Order No.:		**Date Instructed:**	23-Nov-2018
No. of Samples:	1		
Turnaround (Wkdays):	4	**Results Due:**	28-Nov-2018
Date Approved:	30-Nov-2018		

Approved By:

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

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Results - Leachate

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36777
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729625
Order No.:			Client Sample Ref.:		ES
			Sample Location:		BH05
			Sample Type:		SOIL
			Top Depth (m):		1.00
			Date Sampled:		19-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
pH	U	1010		N/A	10.9
Ammonia (Free)	U	1220	mg/l	0.050	0.17
Nitrite as N	U	1220	mg/l	0.010	0.012
Nitrate as N	U	1220	mg/l	0.20	0.24
Phosphate as P	U	1220	mg/l	0.050	< 0.050
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050
Aluminium (Dissolved)	N	1450	µg/l	10	300
Arsenic (Dissolved)	U	1450	µg/l	1.0	1.2
Boron (Dissolved)	U	1450	µg/l	20	28
Barium (Dissolved)	U	1450	µg/l	5.0	11
Beryllium (Dissolved)	U	1450	µg/l	1.0	< 1.0
Cadmium (Dissolved)	U	1450	µg/l	0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	6.7
Copper (Dissolved)	U	1450	µg/l	1.0	2.7
Manganese (Dissolved)	U	1450	µg/l	1.0	10
Nickel (Dissolved)	U	1450	µg/l	1.0	< 1.0
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0	1.1
Vanadium (Dissolved)	U	1450	µg/l	1.0	18
Zinc (Dissolved)	U	1450	µg/l	1.0	4.5
Mercury Low Level	U	1460	µg/l	0.010	< 0.010
Iron (Dissolved)	N	1450	µg/l	20	100
Chromium (Hexavalent)	U	1490	µg/l	20	< 20
Aliphatic TPH >C5-C6	N	1675	µg/l	0.010	< 0.010
Aliphatic TPH >C6-C8	N	1675	µg/l	0.010	< 0.010
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	1.0	< 1.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.010	< 0.010
Aromatic TPH >C7-C8	N	1675	µg/l	0.010	< 0.010
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10

Chemtest
The right chemistry to deliver results

Results - Leachate

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36777
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729625
Order No.:			Client Sample Ref.:		ES
			Sample Location:		BH05
			Sample Type:		SOIL
			Top Depth (m):		1.00
			Date Sampled:		19-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	1.0	< 1.0
Total Petroleum Hydrocarbons	N	1675	µg/l	2.0	< 2.0
Total Of 16 PAH's	N	1700	µg/l	0.20	< 0.20
Dichlorodifluoromethane	N	1760	µg/l	0.10	< 0.10
Chloromethane	N	1760	µg/l	0.10	< 0.10
Vinyl Chloride	N	1760	µg/l	0.10	< 0.10
Bromomethane	N	1760	µg/l	2.0	< 2.0
Chloroethane	N	1760	µg/l	0.20	< 0.20
Trichlorofluoromethane	N	1760	µg/l	0.10	< 0.10
1,1-Dichloroethene	N	1760	µg/l	0.10	< 0.10
Dichloromethane	N	1760	µg/l	100	< 100
1,1-Dichloroethane	N	1760	µg/l	0.10	< 0.10
cis 1,2-Dichloroethene	N	1760	µg/l	0.10	< 0.10
Bromochloromethane	N	1760	µg/l	0.50	< 0.50
Trichloromethane	N	1760	µg/l	0.10	< 0.10
1,1,1-Trichloroethane	N	1760	µg/l	0.10	< 0.10
Tetrachloromethane	N	1760	µg/l	0.10	< 0.10
1,1-Dichloropropene	N	1760	µg/l	0.10	< 0.10
Benzene	N	1760	µg/l	0.10	< 0.10
1,2-Dichloroethane	N	1760	µg/l	0.20	< 0.20
Trichloroethene	N	1760	µg/l	0.10	< 0.10
1,2-Dichloropropane	N	1760	µg/l	0.10	< 0.10
Dibromomethane	N	1760	µg/l	0.10	< 0.10
Bromodichloromethane	N	1760	µg/l	0.50	< 0.50
cis-1,3-Dichloropropene	N	1760	µg/l	1.0	< 1.0
Toluene	N	1760	µg/l	0.10	< 0.10
Trans-1,3-Dichloropropene	N	1760	µg/l	1.0	< 1.0
1,1,2-Trichloroethane	N	1760	µg/l	1.0	< 1.0
Tetrachloroethene	N	1760	µg/l	0.10	< 0.10
1,3-Dichloropropane	N	1760	µg/l	0.20	< 0.20
Dibromochloromethane	N	1760	µg/l	1.0	< 1.0
1,2-Dibromoethane	N	1760	µg/l	0.50	< 0.50
Chlorobenzene	N	1760	µg/l	0.10	< 0.10
1,1,1,2-Tetrachloroethane	N	1760	µg/l	0.20	< 0.20
Ethylbenzene	N	1760	µg/l	0.10	< 0.10
m & p-Xylene	N	1760	µg/l	0.10	< 0.10
o-Xylene	N	1760	µg/l	0.10	< 0.10
Styrene	N	1760	µg/l	0.10	< 0.10

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Results - Leachate

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36777
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729625
Order No.:			Client Sample Ref.:		ES
			Sample Location:		BH05
			Sample Type:		SOIL
			Top Depth (m):		1.00
			Date Sampled:		19-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Tribromomethane	N	1760	µg/l	1.0	< 1.0
Isopropylbenzene	N	1760	µg/l	0.10	< 0.10
Bromobenzene	N	1760	µg/l	0.10	< 0.10
1,2,3-Trichloropropane	N	1760	µg/l	5.0	< 5.0
N-Propylbenzene	N	1760	µg/l	0.10	< 0.10
2-Chlorotoluene	N	1760	µg/l	0.10	< 0.10
1,3,5-Trimethylbenzene	N	1760	µg/l	0.10	< 0.10
4-Chlorotoluene	N	1760	µg/l	0.10	< 0.10
Tert-Butylbenzene	N	1760	µg/l	0.10	< 0.10
1,2,4-Trimethylbenzene	N	1760	µg/l	0.10	< 0.10
Sec-Butylbenzene	N	1760	µg/l	0.10	< 0.10
1,3-Dichlorobenzene	N	1760	µg/l	0.10	< 0.10
4-Isopropyltoluene	N	1760	µg/l	0.10	< 0.10
1,4-Dichlorobenzene	N	1760	µg/l	0.10	< 0.10
N-Butylbenzene	N	1760	µg/l	0.10	< 0.10
1,2-Dichlorobenzene	N	1760	µg/l	0.10	< 0.10
1,2-Dibromo-3-Chloropropane	N	1760	µg/l	5.0	< 5.0
1,2,4-Trichlorobenzene	N	1760	µg/l	0.10	< 0.10
Hexachlorobutadiene	N	1760	µg/l	0.10	< 0.10
1,2,3-Trichlorobenzene	N	1760	µg/l	0.20	< 0.20
Naphthalene	N	1760	µg/l	0.10	< 0.10
Phenol	N	1790	µg/l	0.050	< 0.050
2-Chlorophenol	N	1790	µg/l	0.050	< 0.050
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.050	< 0.050
1,3-Dichlorobenzene	N	1790	µg/l	0.050	< 0.050
1,4-Dichlorobenzene	N	1790	µg/l	0.050	< 0.050
1,2-Dichlorobenzene	N	1790	µg/l	0.050	< 0.050
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.050	< 0.050
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.050	< 0.050
Hexachloroethane	N	1790	µg/l	0.050	< 0.050
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.050	< 0.050
4-Methylphenol	N	1790	µg/l	0.050	< 0.050
Nitrobenzene	N	1790	µg/l	0.050	< 0.050
Isophorone	N	1790	µg/l	0.050	< 0.050
2-Nitrophenol	N	1790	µg/l	0.050	< 0.050
2,4-Dimethylphenol	N	1790	µg/l	0.050	< 0.050
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.050	< 0.050
2,4-Dichlorophenol	N	1790	µg/l	0.050	< 0.050
1,2,4-Trichlorobenzene	N	1790	µg/l	0.050	< 0.050

Chemtest
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Results - Leachate

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36777
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729625
Order No.:			Client Sample Ref.:		ES
			Sample Location:		BH05
			Sample Type:		SOIL
			Top Depth (m):		1.00
			Date Sampled:		19-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Naphthalene	N	1790	µg/l	0.050	< 0.050
4-Chloroaniline	N	1790	µg/l	0.050	< 0.050
Hexachlorobutadiene	N	1790	µg/l	0.050	< 0.050
4-Chloro-3-Methylphenol	N	1790	µg/l	0.050	< 0.050
2-Methylnaphthalene	N	1790	µg/l	0.050	< 0.050
Hexachlorocyclopentadiene	N	1790	µg/l	0.050	< 0.050
2,4,6-Trichlorophenol	N	1790	µg/l	0.050	< 0.050
2,4,5-Trichlorophenol	N	1790	µg/l	0.050	< 0.050
2-Chloronaphthalene	N	1790	µg/l	0.050	< 0.050
2-Nitroaniline	N	1790	µg/l	0.050	< 0.050
Acenaphthylene	N	1790	µg/l	0.050	< 0.050
Dimethylphthalate	N	1790	µg/l	0.050	< 0.050
2,6-Dinitrotoluene	N	1790	µg/l	0.050	< 0.050
Acenaphthene	N	1790	µg/l	0.050	< 0.050
3-Nitroaniline	N	1790	µg/l	0.050	< 0.050
Dibenzofuran	N	1790	µg/l	0.050	< 0.050
4-Chlorophenylphenylether	N	1790	µg/l	0.050	< 0.050
2,4-Dinitrotoluene	N	1790	µg/l	0.050	< 0.050
Fluorene	N	1790	µg/l	0.050	< 0.050
Diethyl Phthalate	N	1790	µg/l	0.050	< 0.050
4-Nitroaniline	N	1790	µg/l	0.050	< 0.050
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.050	< 0.050
Azobenzene	N	1790	µg/l	0.050	< 0.050
4-Bromophenylphenyl Ether	N	1790	µg/l	0.050	< 0.050
Hexachlorobenzene	N	1790	µg/l	0.050	< 0.050
Pentachlorophenol	N	1790	µg/l	0.050	< 0.050
Phenanthrene	N	1790	µg/l	0.050	< 0.050
Anthracene	N	1790	µg/l	0.050	< 0.050
Carbazole	N	1790	µg/l	0.050	< 0.050
Di-N-Butyl Phthalate	N	1790	µg/l	0.050	< 0.050
Fluoranthene	N	1790	µg/l	0.050	< 0.050
Pyrene	N	1790	µg/l	0.050	< 0.050
Butylbenzyl Phthalate	N	1790	µg/l	0.050	< 0.050
Benzo[a]anthracene	N	1790	µg/l	0.050	< 0.050
Chrysene	N	1790	µg/l	0.050	< 0.050
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.050	< 0.050
Di-N-Octyl Phthalate	N	1790	µg/l	0.050	< 0.050
Benzo[b]fluoranthene	N	1790	µg/l	0.050	< 0.050
Benzo[k]fluoranthene	N	1790	µg/l	0.050	< 0.050

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Results - Leachate

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36777
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729625
Order No.:			Client Sample Ref.:		ES
			Sample Location:		BH05
			Sample Type:		SOIL
			Top Depth (m):		1.00
			Date Sampled:		19-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
Benzo[a]pyrene	N	1790	µg/l	0.050	< 0.050
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.050	< 0.050
Dibenz(a,h)Anthracene	N	1790	µg/l	0.050	< 0.050
Benzo[g,h,i]perylene	N	1790	µg/l	0.050	< 0.050
Naphthalene	N	1800	µg/l	0.010	< 0.010
Acenaphthylene	N	1800	µg/l	0.010	0.010
Acenaphthene	N	1800	µg/l	0.010	< 0.010
Fluorene	N	1800	µg/l	0.010	< 0.010
Phenanthrene	N	1800	µg/l	0.010	< 0.010
Anthracene	N	1800	µg/l	0.010	0.020
Fluoranthene	N	1800	µg/l	0.010	< 0.010
Pyrene	N	1800	µg/l	0.010	< 0.010
Benzo[a]anthracene	N	1800	µg/l	0.010	0.030
Chrysene	N	1800	µg/l	0.010	0.030
Benzo[b]fluoranthene	N	1800	µg/l	0.010	0.030
Benzo[k]fluoranthene	N	1800	µg/l	0.010	0.040
Benzo[a]pyrene	N	1800	µg/l	0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	1800	µg/l	0.010	< 0.010
Dibenz(a,h)Anthracene	N	1800	µg/l	0.010	0.020
Benzo[g,h,i]perylene	N	1800	µg/l	0.010	< 0.010
PCB 28	N	1815	µg/l	0.010	< 0.010
PCB 52	N	1815	µg/l	0.010	< 0.010
PCB 90+101	N	1815	µg/l	0.010	< 0.010
PCB 118	N	1815	µg/l	0.010	< 0.010
PCB 153	N	1815	µg/l	0.010	< 0.010
PCB 138	N	1815	µg/l	0.010	< 0.010
PCB 180	N	1815	µg/l	0.010	< 0.010
Total PCBs (7 congeners)	N	1815	µg/l	0.010	< 0.010
Phenol	N	1900	µg/l	0.20	< 0.20
2-Chlorophenol	N	1900	µg/l	0.20	< 0.20
2-Methylphenol (o-Cresol)	N	1900	µg/l	0.20	< 0.20
3-Methylphenol	N	1900	µg/l	0.20	< 0.20
4-Methylphenol	N	1900	µg/l	0.20	< 0.20
2-Nitrophenol	N	1900	µg/l	0.20	< 0.20
2,4-Dimethylphenol	N	1900	µg/l	0.20	< 0.20
2,4-Dichlorophenol	N	1900	µg/l	0.20	< 0.20
2,6-Dichlorophenol	N	1900	µg/l	0.20	< 0.20
4-Chloro-3-Methylphenol	N	1900	µg/l	0.20	< 0.20
2,3,4-Trichlorophenol	N	1900	µg/l	0.20	< 0.20

Results - Leachate

Project: 18-1287 Dublin Port Company Berth 47a

Client: Causeway Geotech Ltd				**Chemtest Job No.:**	18-36777
Quotation No.: Q18-15154				**Chemtest Sample ID.:**	729625
Order No.:				Client Sample Ref.:	ES
				Sample Location:	BH05
				Sample Type:	SOIL
				Top Depth (m):	1.00
				Date Sampled:	19-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**	
2,3,5-Trichlorophenol	N	1900	µg/l	0.20	< 0.20
2,3,6-Trichlorophenol	N	1900	µg/l	0.20	< 0.20
2,4,6-Trichlorophenol	N	1900	µg/l	0.20	< 0.20
2,4,5-Trichlorophenol	N	1900	µg/l	0.20	< 0.20
4-Nitrophenol	N	1900	µg/l	0.20	< 0.20
2,3,4,5-Tetrachlorophenol	N	1900	µg/l	0.20	< 0.20
2,3,4,6-Tetrachlorophenol	N	1900	µg/l	0.20	< 0.20
2,3,5,6-Tetrachlorophenol	N	1900	µg/l	0.20	< 0.20
3,4,5-Trichlorophenol	N	1900	µg/l	0.20	< 0.20
2-Methyl-4,6-Dinitrophenol	N	1900	µg/l	0.20	< 0.20
Pentachlorophenol	N	1900	µg/l	0.20	< 0.20
2-Sec-Butyl-4,6-Dinitrophenol	N	1900	µg/l	0.20	< 0.20
Total Phenols	N	1900	µg/l	5.00	< 5.0

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Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest
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Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.: 18-36936-1

Initial Date of Issue: 03-Dec-2018

Client Causeway Geotech Ltd

Client Address: 8 Drumahiskey Road
Balnamore
Ballymoney
County Antrim
BT53 7QL

Contact(s): Carin Cornwall
Colm Hurley
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Gabriella Horan
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Neil Haggan
Paul Dunlop
Paul McNamara
Sean Ross
Stephen Franey
Stephen Watson
Stuart Abraham

Project 18-1287 Dublin Port Berth 47a

Quotation No.: Q18-15154 **Date Received:** 22-Nov-2018

Order No.: **Date Instructed:** 23-Nov-2018

No. of Samples: 7

Turnaround (Wkdays): 5 **Results Due:** 29-Nov-2018

Date Approved: 03-Dec-2018

Approved By:

Details: Robert Monk, Technical Manager

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
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Results - Leachate

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd				**Chemtest Job No.:**	18-36936	18-36936	18-36936	18-36936	18-36936	18-36936	18-36936
Quotation No.: Q18-15154				**Chemtest Sample ID.:**	729505	729509	729512	729519	729522	729528	729529
				Sample Location:	TP01	TP02	TP03	TP05	TP06	TP07	TP08
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	2.0	1.0	1.0	1.0	1.0	3.0	0.5
				Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
pH	U	1010		N/A	8.6	9.0	9.1	9.3	9.1	8.9	11.0
Ammonia (Free)	U	1220	mg/l	0.050	< 0.050	< 0.050	< 0.050	0.091	0.058	0.085	0.12
Nitrite as N	U	1220	mg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Nitrate as N	U	1220	mg/l	0.20	1.0	0.36	0.88	0.33	4.7	0.85	1.7
Phosphate as P	U	1220	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Aluminium (Dissolved)	N	1450	µg/l	10	100	74	41	88	120	55	640
Arsenic (Dissolved)	U	1450	µg/l	1.0	1.1	3.2	3.2	2.0	1.9	3.8	< 1.0
Boron (Dissolved)	U	1450	µg/l	20	120	33	< 20	< 20	< 20	< 20	38
Barium (Dissolved)	U	1450	µg/l	5.0	11	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	6.7
Beryllium (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium (Dissolved)	U	1450	µg/l	0.080	0.081	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0	4.8	3.6	< 1.0	< 1.0	< 1.0	< 1.0	5.3
Copper (Dissolved)	U	1450	µg/l	1.0	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.9
Manganese (Dissolved)	U	1450	µg/l	1.0	21	2.1	2.1	1.0	5.6	12	< 1.0
Nickel (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Lead (Dissolved)	U	1450	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0	5.8	1.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (Dissolved)	U	1450	µg/l	1.0	1.7	5.5	7.1	2.9	3.0	7.2	16
Zinc (Dissolved)	U	1450	µg/l	1.0	2.5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Mercury Low Level	U	1460	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Iron (Dissolved)	N	1450	µg/l	20	53	32	34	< 20	< 20	31	100
Chromium (Hexavalent)	U	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Aliphatic TPH >C5-C6	N	1675	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C6-C8	N	1675	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C7-C8	N	1675	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Chemtest
The right chemistry to deliver results

Results - Leachate

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd			Chemtest Job No.:		18-36936	18-36936	18-36936	18-36936	18-36936	18-36936	18-36936
Quotation No.: Q18-15154			Chemtest Sample ID.:		729505	729509	729512	729519	729522	729528	729529
			Sample Location:		TP01	TP02	TP03	TP05	TP06	TP07	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		2.0	1.0	1.0	1.0	1.0	3.0	0.5
			Date Sampled:		20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
Total Aromatic Hydrocarbons	N	1675	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons	N	1675	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Of 16 PAH's	N	1700	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Dichlorodifluoromethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chloromethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Vinyl Chloride	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Bromomethane	N	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroethane	N	1760	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Trichlorofluoromethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1-Dichloroethene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dichloromethane	N	1760	µg/l	100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
1,1-Dichloroethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
cis 1,2-Dichloroethene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Bromochloromethane	N	1760	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trichloromethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1,1-Trichloroethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Tetrachloromethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1-Dichloropropene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-Dichloroethane	N	1760	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Trichloroethene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-Dichloropropane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibromomethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Bromodichloromethane	N	1760	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,3-Dichloropropene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trans-1,3-Dichloropropene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,3-Dichloropropane	N	1760	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Dibromochloromethane	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	N	1760	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chlorobenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1,1,2-Tetrachloroethane	N	1760	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Ethylbenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
m & p-Xylene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
o-Xylene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Styrene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Tribromomethane	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Chemtest
The right chemistry to deliver results

Results - Leachate

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd			**Chemtest Job No.:**		18-36936	18-36936	18-36936	18-36936	18-36936	18-36936	18-36936
Quotation No.: Q18-15154			**Chemtest Sample ID.:**		729505	729509	729512	729519	729522	729528	729529
			Sample Location:		TP01	TP02	TP03	TP05	TP06	TP07	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		2.0	1.0	1.0	1.0	1.0	3.0	0.5
			Date Sampled:		20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
Bromobenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2,3-Trichloropropane	N	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
N-Propylbenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2-Chlorotoluene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,3,5-Trimethylbenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
4-Chlorotoluene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Tert-Butylbenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2,4-Trimethylbenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Sec-Butylbenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,3-Dichlorobenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
4-Isopropyltoluene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,4-Dichlorobenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
N-Butylbenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-Dichlorobenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-Dibromo-3-Chloropropane	N	1760	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trichlorobenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Hexachlorobutadiene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2,3-Trichlorobenzene	N	1760	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Naphthalene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Chlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,3-Dichlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,4-Dichlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2-Dichlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Hexachloroethane	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Methylphenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Nitrobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Isophorone	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Nitrophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4-Dimethylphenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4-Dichlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2,4-Trichlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Naphthalene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Chloroaniline	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Hexachlorobutadiene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050

Chemtest
The right chemistry to deliver results

Results - Leachate

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd			Chemtest Job No.:		18-36936	18-36936	18-36936	18-36936	18-36936	18-36936	18-36936
Quotation No.: Q18-15154			Chemtest Sample ID.:		729505	729509	729512	729519	729522	729528	729529
			Sample Location:		TP01	TP02	TP03	TP05	TP06	TP07	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		2.0	1.0	1.0	1.0	1.0	3.0	0.5
			Date Sampled:		20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
4-Chloro-3-Methylphenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Methylnaphthalene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Hexachlorocyclopentadiene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4,6-Trichlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4,5-Trichlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Chloronaphthalene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Nitroaniline	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Acenaphthylene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dimethylphthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,6-Dinitrotoluene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Acenaphthene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
3-Nitroaniline	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dibenzofuran	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Chlorophenylphenylether	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4-Dinitrotoluene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Fluorene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Diethyl Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Nitroaniline	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Azobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Bromophenylphenyl Ether	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Hexachlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Pentachlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Phenanthrene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Anthracene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Carbazole	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Di-N-Butyl Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Fluoranthene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Pyrene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Butylbenzyl Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[a]anthracene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Chrysene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Di-N-Octyl Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[b]fluoranthene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[k]fluoranthene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[a]pyrene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dibenz(a,h)Anthracene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[g,h,i]perylene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050

Chemtest
The right chemistry to deliver results

Results - Leachate

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					Chemtest Job No.:	18-36936	18-36936	18-36936	18-36936	18-36936	18-36936	18-36936
Quotation No.: Q18-15154					Chemtest Sample ID.:	729505	729509	729512	729519	729522	729528	729529
					Sample Location:	TP01	TP02	TP03	TP05	TP06	TP07	TP08
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	2.0	1.0	1.0	1.0	1.0	3.0	0.5
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Naphthalene	N	1800	µg/l	0.010		0.040	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthylene	N	1800	µg/l	0.010		< 0.010	0.040	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthene	N	1800	µg/l	0.010		< 0.010	< 0.010	0.040	< 0.010	< 0.010	0.010	< 0.010
Fluorene	N	1800	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Phenanthrene	N	1800	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Anthracene	N	1800	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.040
Fluoranthene	N	1800	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Pyrene	N	1800	µg/l	0.010		< 0.010	0.010	< 0.010	0.010	< 0.010	< 0.010	< 0.010
Benzo[a]anthracene	N	1800	µg/l	0.010		0.030	0.020	0.010	0.010	< 0.010	< 0.010	< 0.010
Chrysene	N	1800	µg/l	0.010		0.020	< 0.010	0.040	< 0.010	0.040	< 0.010	0.070
Benzo[b]fluoranthene	N	1800	µg/l	0.010		< 0.010	< 0.010	0.010	< 0.010	< 0.010	0.020	< 0.010
Benzo[k]fluoranthene	N	1800	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	0.030	< 0.010	0.070
Benzo[a]pyrene	N	1800	µg/l	0.010		< 0.010	< 0.010	< 0.010	0.030	0.040	0.040	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	1800	µg/l	0.010		< 0.010	0.010	< 0.010	< 0.010	< 0.010	0.030	< 0.010
Dibenz(a,h)Anthracene	N	1800	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	0.040	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	1800	µg/l	0.010		< 0.010	0.020	0.020	0.010	0.020	< 0.010	< 0.010
PCB 28	N	1815	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 52	N	1815	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 90+101	N	1815	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 118	N	1815	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 153	N	1815	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 138	N	1815	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
PCB 180	N	1815	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 congeners)	N	1815	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Phenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Chlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Methylphenol (o-Cresol)	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
3-Methylphenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
4-Methylphenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Nitrophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,4-Dimethylphenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,4-Dichlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,6-Dichlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
4-Chloro-3-Methylphenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,4-Trichlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,5-Trichlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,6-Trichlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,4,6-Trichlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,4,5-Trichlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
4-Nitrophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20

Chemtest
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Results - Leachate

Project: 18-1287 Dublin Port Berth 47a

Client: Causeway Geotech Ltd					**Chemtest Job No.:**	18-36936	18-36936	18-36936	18-36936	18-36936	18-36936	18-36936
Quotation No.: Q18-15154					**Chemtest Sample ID.:**	729505	729509	729512	729519	729522	729528	729529
					Sample Location:	TP01	TP02	TP03	TP05	TP06	TP07	TP08
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	2.0	1.0	1.0	1.0	1.0	3.0	0.5
					Date Sampled:	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018	20-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
2,3,4,5-Tetrachlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,4,6-Tetrachlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,5,6-Tetrachlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
3,4,5-Trichlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Methyl-4,6-Dinitrophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Pentachlorophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Sec-Butyl-4,6-Dinitrophenol	N	1900	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Total Phenols	N	1900	µg/l	5.00		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Chemtest
The right chemistry to deliver results

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	18-36943-1
Initial Date of Issue:	05-Dec-2018
Client	Causeway Geotech Ltd
Client Address:	8 Drumahiskey Road Balnamore Ballymoney County Antrim BT53 7QL
Contact(s):	Carin Cornwall Colm Hurley Darren O'Mahony Gabriella Horan John Cameron Lucy Newland Lucy Peaker Matthew Gilbert Neil Haggan Paul Dunlop Paul McNamara Sean Ross Stephen Franey Stephen Watson Stuart Abraham
Project	18-1287 Dublin Port Berth 47a

Quotation No.:	Q18-15154	**Date Received:**	22-Nov-2018
Order No.:		**Date Instructed:**	23-Nov-2018
No. of Samples:	3		
Turnaround (Wkdays):	7	**Results Due:**	03-Dec-2018
Date Approved:	05-Dec-2018		

Approved By:

Details: Glynn Harvey, Laboratory Manager

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Results - 2 Stage WAC

Project: 18-1287 Dublin Port Berth 47a

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	18-36943								
Chemtest Sample ID:	729503								
Sample Ref:									
Sample ID:									
Sample Location:	TP01								
Top Depth(m):	0.5								
Bottom Depth(m):									
Sampling Date:	20-Nov-2018								
Determinand	**SOP**	**Accred.**	**Units**				**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%			2.5	3	5	6
Loss On Ignition	2610	U	%			3.8	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg			1300	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			5.6	100	--	--
pH	2010	U				10.1	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.20	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0013	< 0.0010	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.0081	0.0076	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0039	< 0.0010	< 0.050	< 0.050	2	50	100
Mercury	1450	U	0.0021	< 0.00050	0.0042	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0053	0.010	< 0.050	0.092	0.5	10	30
Nickel	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0019	< 0.0010	< 0.010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	0.0020	< 0.010	0.017	0.1	0.5	7
Zinc	1450	U	< 0.0010	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	8.7	5.6	17	61	800	15000	25000
Fluoride	1220	U	0.36	0.25	< 1.0	2.7	10	150	500
Sulphate	1220	U	45	13	90	180	1000	20000	50000
Total Dissolved Solids	1020	N	130	65	260	760	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	17	11	< 50	120	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	5.8

Leachate Test Information	
Leachant volume 1st extract/l	0.339
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.293

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: 18-1287 Dublin Port Berth 47a

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	18-36943								
Chemtest Sample ID:	729514								
Sample Ref:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	TP04								
Top Depth(m):	0.5								
Bottom Depth(m):									
Sampling Date:	20-Nov-2018								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	U	%			2.5	3	5	6
Loss On Ignition	2610	U	%			3.6	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg			58	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			5.6	100	--	--
pH	2010	U				10.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.27	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.011	0.0051	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	0.0084	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.018	0.0077	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	0.0055	0.0011	< 0.050	< 0.050	0.5	10	30
Nickel	1450	U	0.0031	0.0014	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	0.0023	0.0012	< 0.010	0.014	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.012	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	15	3.9	30	57	800	15000	25000
Fluoride	1220	U	0.33	0.24	< 1.0	2.5	10	150	500
Sulphate	1220	U	84	22	170	320	1000	20000	50000
Total Dissolved Solids	1020	N	210	120	430	1300	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	24	13	< 50	150	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.3

Leachate Test Information	
Leachant volume 1st extract/l	0.334
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.288

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - 2 Stage WAC

Project: 18-1287 Dublin Port Berth 47a

							Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	18-36943								
Chemtest Sample ID:	729526								
Sample Ref:							**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Sample ID:									
Sample Location:	TP07								
Top Depth(m):	1.0								
Bottom Depth(m):									
Sampling Date:	20-Nov-2018								
Determinand	**SOP**	**Accred.**	**Units**						
Total Organic Carbon	2625	U	%			< 0.20	3	5	6
Loss On Ignition	2610	U	%			0.62	--	--	10
Total BTEX	2760	U	mg/kg			< 0.010	6	--	--
Total PCBs (7 Congeners)	2815	U	mg/kg			< 0.10	1	--	--
TPH Total WAC (Mineral Oil)	2670	U	mg/kg			56	500	--	--
Total (Of 17) PAH's	2700	N	mg/kg			< 2.0	100	--	--
pH	2010	U				9.3	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg			0.048	--	To evaluate	To evaluate
Eluate Analysis			**2:1 mg/l**	**8:1 mg/l**	**2:1 mg/kg**	**Cumulative mg/kg 10:1**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1450	U	0.0057	0.0028	< 0.050	< 0.050	0.5	2	25
Barium	1450	U	0.0023	0.0012	< 0.50	< 0.50	20	100	300
Cadmium	1450	U	< 0.00010	< 0.00010	< 0.010	< 0.010	0.04	1	5
Chromium	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	70
Copper	1450	U	0.0014	< 0.0010	< 0.050	< 0.050	2	50	100
Mercury	1450	U	< 0.00050	< 0.00050	< 0.0010	< 0.0050	0.01	0.2	2
Molybdenum	1450	U	< 0.0010	< 0.0010	< 0.050	< 0.050	0.5	10	30
Nickel	1450	U	0.0011	< 0.0010	< 0.050	< 0.050	0.4	10	40
Lead	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.5	10	50
Antimony	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.06	0.7	5
Selenium	1450	U	< 0.0010	< 0.0010	< 0.010	< 0.010	0.1	0.5	7
Zinc	1450	U	0.0038	< 0.0010	< 0.50	< 0.50	4	50	200
Chloride	1220	U	5.4	4.9	11	50	800	15000	25000
Fluoride	1220	U	0.13	0.10	< 1.0	1.0	10	150	500
Sulphate	1220	U	11	3.1	22	41	1000	20000	50000
Total Dissolved Solids	1020	N	78	37	160	420	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.030	< 0.30	< 0.50	1	-	-
Dissolved Organic Carbon	1610	U	7.9	7.3	< 50	74	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.175
Moisture (%)	8.7

Leachate Test Information	
Leachant volume 1st extract/l	0.333
Leachant volume 2nd extract/l	1.400
Eluant recovered from 1st extract/l	0.222

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Report Information

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<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	18-37699-1
Initial Date of Issue:	06-Dec-2018
Client	Causeway Geotech Ltd
Client Address:	8 Drumahiskey Road Balnamore Ballymoney County Antrim BT53 7QL
Contact(s):	Carin Cornwall Colm Hurley Darren O'Mahony Gabriella Horan John Cameron Lucy Peaker Matthew Gilbert Neil Haggan Paul Dunlop Paul McNamara Sean Ross Stephen Franey Stephen Watson Stuart Abraham
Project	18-1287 Dublin Port Compay Berth 47a

Quotation No.:	Q18-15154	**Date Received:**	30-Nov-2018
Order No.:		**Date Instructed:**	30-Nov-2018
No. of Samples:	7		
Turnaround (Wkdays):	3	**Results Due:**	04-Dec-2018
Date Approved:	05-Dec-2018	**Subcon Results Due:**	21-Dec-2018

Approved By:

Details: Glynn Harvey, Laboratory Manager

Chemtest Ltd.
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
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Results - Water

Project: 18-1287 Dublin Port Compay Berth 47a

Client: Causeway Geotech Ltd					**Chemtest Job No.:**	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699
Quotation No.: Q18-15154					**Chemtest Sample ID.:**	733826	733827	733828	733829	733830	733831	733832
					Sample Location:	BH01	BH02	BH03	BH04	BH05	SW1	SW2
					Sample Type:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
					Date Sampled:	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
pH	U	1010		N/A		7.8	8.2	8.5	8.0	8.0	8.0	8.0
Alkalinity (Total)	U	1220	mg/l	10		500	400	220	310	400	89	84
Chloride	U	1220	mg/l	1.0		9100	5200	1400	13000	9900	15000	16000
Ammonia (Free)	U	1220	mg/l	0.050		0.29	0.58	0.47	0.23	0.51	0.12	0.10
Ammonia (Free) as N	U	1220	mg/l	0.050		0.24	0.48	0.39	0.19	0.42	0.099	0.083
Nitrite	U	1220	mg/l	0.020		0.14	0.054	< 0.020	< 0.020	< 0.020	0.051	0.050
Nitrate	U	1220	mg/l	0.50		0.61	< 0.50	0.98	< 0.50	< 0.50	< 0.50	< 0.50
Phosphate	U	1220	mg/l	0.200		< 0.20	0.46	0.63	< 0.20	0.78	0.23	0.20
Sulphate	U	1220	mg/l	1.0		1300	670	310	1500	1400	2000	2100
Cyanide (Total)	U	1300	mg/l	0.050		< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium	U	1415	mg/l	5.0		250	180	170	330	190	250	290
Potassium	U	1415	mg/l	0.50		190	100	74	230	140	220	250
Magnesium	U	1415	mg/l	0.50		470	260	100	700	390	700	800
Sodium	U	1415	mg/l	0.50		4900	2300	560	6200	3600	7800	6600
Total Hardness as CaCO3	U	1270	mg/l	15		2600	1500	830	3700	2100	3500	4000
Aluminium (Dissolved)	N	1450	µg/l	10		25	110	88	170	< 10	< 10	< 10
Arsenic (Dissolved)	U	1450	µg/l	1.0		34	24	15	54	50	72	74
Boron (Dissolved)	U	1450	µg/l	20		1700	1000	330	1900	1900	2600	2800
Barium (Dissolved)	U	1450	µg/l	5.0		36	81	29	34	65	11	9.3
Beryllium (Dissolved)	U	1450	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium (Dissolved)	U	1450	µg/l	0.080		0.60	0.20	0.080	0.31	0.31	< 0.080	< 0.080
Chromium (Dissolved)	U	1450	µg/l	1.0		200	97	50	200	270	290	290
Copper (Dissolved)	U	1450	µg/l	1.0		190	190	16	660	610	960	780
Iron (Dissolved)	N	1450	µg/l	20		610	700	440	1200	840	1000	970
Mercury (Dissolved)	U	1450	µg/l	0.50		< 0.50	< 0.50	< 0.50	0.74	< 0.50	0.85	0.89
Manganese (Dissolved)	U	1450	µg/l	1.0		1300	210	140	1300	1700	69	12
Nickel (Dissolved)	U	1450	µg/l	1.0		9.7	4.4	2.5	9.6	11	5.6	6.2
Lead (Dissolved)	U	1450	µg/l	1.0		6.2	< 1.0	3.7	< 1.0	< 1.0	< 1.0	< 1.0
Selenium (Dissolved)	U	1450	µg/l	1.0		< 1.0	15	6.3	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (Dissolved)	U	1450	µg/l	1.0		48	31	16	62	63	86	90
Zinc (Dissolved)	U	1450	µg/l	1.0		68	29	24	57	65	63	62
Chromium (Hexavalent)	U	1490	µg/l	20		< 20	< 20	< 20	< 20	< 20	< 20	< 20
Aliphatic TPH >C5-C6	N	1675	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C6-C8	N	1675	µg/l	0.010		< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Results - Water

Project: 18-1287 Dublin Port Compay Berth 47a

Client: Causeway Geotech Ltd				**Chemtest Job No.:**	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699
Quotation No.: Q18-15154				**Chemtest Sample ID.:**	733826	733827	733828	733829	733830	733831	733832
				Sample Location:	BH01	BH02	BH03	BH04	BH05	SW1	SW2
				Sample Type:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
				Date Sampled:	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
Aromatic TPH >C5-C7	N	1675	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C7-C8	N	1675	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Petroleum Hydrocarbons	N	1675	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Naphthalene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthylene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Acenaphthene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Fluorene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Phenanthrene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Anthracene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Fluoranthene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Pyrene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[a]anthracene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chrysene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[b]fluoranthene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[k]fluoranthene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[a]pyrene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Indeno(1,2,3-c,d)Pyrene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Dibenz(a,h)Anthracene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Benzo[g,h,i]perylene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Coronene	N	1700	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Total Of 17 PAH's	N	1700	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Dibutyl Tin	N	1730	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Tributyl Tin	N	1730	µg/l	0.0500	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dichlorodifluoromethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chloromethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Vinyl Chloride	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Bromomethane	N	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Chloroethane	N	1760	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Trichlorofluoromethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1-Dichloroethene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trans 1,2-Dichloroethene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1-Dichloroethane	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
cis 1,2-Dichloroethene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Bromochloromethane	N	1760	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

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Results - Water

Project: 18-1287 Dublin Port Compay Berth 47a

Client: Causeway Geotech Ltd					**Chemtest Job No.:**	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699
Quotation No.: Q18-15154					**Chemtest Sample ID.:**	733826	733827	733828	733829	733830	733831	733832
					Sample Location:	BH01	BH02	BH03	BH04	BH05	SW1	SW2
					Sample Type:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
					Date Sampled:	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Trichloromethane	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1,1-Trichloroethane	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Tetrachloromethane	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1-Dichloropropene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-Dichloroethane	N	1760	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Trichloroethene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-Dichloropropane	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibromomethane	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Bromodichloromethane	N	1760	µg/l	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
cis-1,3-Dichloropropene	N	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trans-1,3-Dichloropropene	N	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	N	1760	µg/l	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Tetrachloroethene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,3-Dichloropropane	N	1760	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Dibromochloromethane	N	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	N	1760	µg/l	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chlorobenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,1,1,2-Tetrachloroethane	N	1760	µg/l	0.20		< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Ethylbenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
m & p-Xylene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
o-Xylene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Styrene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Tribromomethane	N	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Bromobenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2,3-Trichloropropane	N	1760	µg/l	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
N-Propylbenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
2-Chlorotoluene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,3,5-Trimethylbenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
4-Chlorotoluene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Tert-Butylbenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2,4-Trimethylbenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Sec-Butylbenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,3-Dichlorobenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
4-Isopropyltoluene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,4-Dichlorobenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
N-Butylbenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-Dichlorobenzene	N	1760	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2-Dibromo-3-Chloropropane	N	1760	µg/l	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Chemtest
The right chemistry to deliver results

Results - Water

Project: 18-1287 Dublin Port Compay Berth 47a

Client: Causeway Geotech Ltd				**Chemtest Job No.:**	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699
Quotation No.: Q18-15154				**Chemtest Sample ID.:**	733826	733827	733828	733829	733830	733831	733832
				Sample Location:	BH01	BH02	BH03	BH04	BH05	SW1	SW2
				Sample Type:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
				Date Sampled:	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
1,2,4-Trichlorobenzene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Hexachlorobutadiene	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
1,2,3-Trichlorobenzene	N	1760	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Methyl Tert-Butyl Ether	N	1760	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
N-Nitrosodimethylamine	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Phenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Chlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,3-Dichlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,4-Dichlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2-Dichlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Hexachloroethane	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Methylphenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Nitrobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Isophorone	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Nitrophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4-Dimethylphenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4-Dichlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
1,2,4-Trichlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Naphthalene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Chloroaniline	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Hexachlorobutadiene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Chloro-3-Methylphenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Methylnaphthalene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Hexachlorocyclopentadiene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4,6-Trichlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4,5-Trichlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Chloronaphthalene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Nitroaniline	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Acenaphthylene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dimethylphthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,6-Dinitrotoluene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Acenaphthene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
3-Nitroaniline	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dibenzofuran	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Chlorophenylphenylether	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2,4-Dinitrotoluene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050

Chemtest
The right chemistry to deliver results

Results - Water

Project: 18-1287 Dublin Port Compay Berth 47a

Client: Causeway Geotech Ltd		Chemtest Job No.:			18-37699	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699
Quotation No.: Q18-15154		Chemtest Sample ID.:			733826	733827	733828	733829	733830	733831	733832
				Sample Location:	BH01	BH02	BH03	BH04	BH05	SW1	SW2
				Sample Type:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
				Date Sampled:	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
Fluorene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Diethyl Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Nitroaniline	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Azobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Bromophenylphenyl Ether	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Hexachlorobenzene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Pentachlorophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Phenanthrene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Anthracene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Carbazole	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Di-N-Butyl Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Fluoranthene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Pyrene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Butylbenzyl Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[a]anthracene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Chrysene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Di-N-Octyl Phthalate	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[b]fluoranthene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[k]fluoranthene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[a]pyrene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Dibenz(a,h)Anthracene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Benzo[g,h,i]perylene	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
4-Nitrophenol	N	1790	µg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
PCB 28	N	1815	µg/l	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 52	N	1815	µg/l	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 90+101	N	1815	µg/l	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 118	N	1815	µg/l	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 153	N	1815	µg/l	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 138	N	1815	µg/l	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 180	N	1815	µg/l	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total PCBs (7 congeners)	N	1815	µg/l	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Phenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Chlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Methylphenol (o-Cresol)	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
3-Methylphenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
4-Methylphenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Nitrophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,4-Dimethylphenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20

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Results - Water

Project: 18-1287 Dublin Port Compay Berth 47a

Client: Causeway Geotech Ltd				**Chemtest Job No.:**	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699	18-37699
Quotation No.: Q18-15154				**Chemtest Sample ID.:**	733826	733827	733828	733829	733830	733831	733832
				Sample Location:	BH01	BH02	BH03	BH04	BH05	SW1	SW2
				Sample Type:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
				Date Sampled:	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018	28-Nov-2018
Determinand	**Accred.**	**SOP**	**Units**	**LOD**							
2,4-Dichlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,6-Dichlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
4-Chloro-3-Methylphenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,4-Trichlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,5-Trichlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,6-Trichlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,4,6-Trichlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,4,5-Trichlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
4-Nitrophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,4,5-Tetrachlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,4,6-Tetrachlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2,3,5,6-Tetrachlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
3,4,5-Trichlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Methyl-4,6-Dinitrophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Pentachlorophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Sec-Butyl-4,6-Dinitrophenol	N	1900	µg/l	0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Total Phenols	N	1900	µg/l	5.00	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1415	Cations in Waters by ICP-MS	Sodium; Potassium; Calcium; Magnesium	Direct determination by inductively coupled plasma - mass spectrometry (ICP-MS).
1450	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GC FID detection
1730	Organo-Leads	Organo-Leads	Solvent extraction / GCMS detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Waters by GC-MS	ICES7 PCB congeners	Solvent extraction / GCMS detection
1900	Phenols in Waters by GC-MS	Approximately 24 substituted Phenols, including Chlorophenols	Solvent extraction / GCMS detection

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com