

## **APPENDIX 7.1      SITE INVESTIGATION REPORT**

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**S.I. Ltd Contract No: 5699**

Client: Castlethorn Construction  
Engineer: Waterman Moylan  
Contractor: Site Investigations Ltd

**Residential Developments**  
**Dunshaughlin, Co. Meath**  
**Site Investigation Report**

Prepared by:

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Stephen Letch

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Revision	1

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  6. Survey Data
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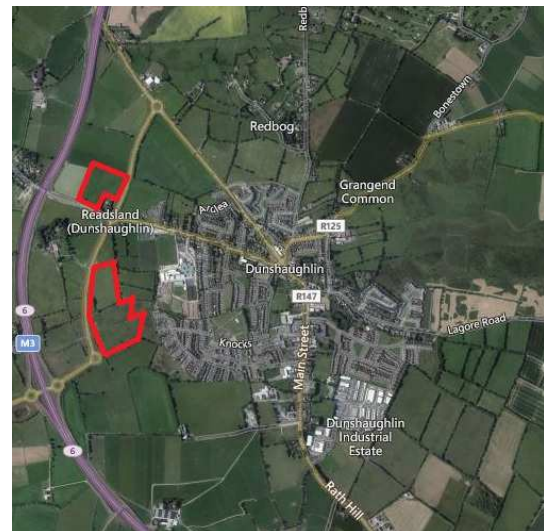
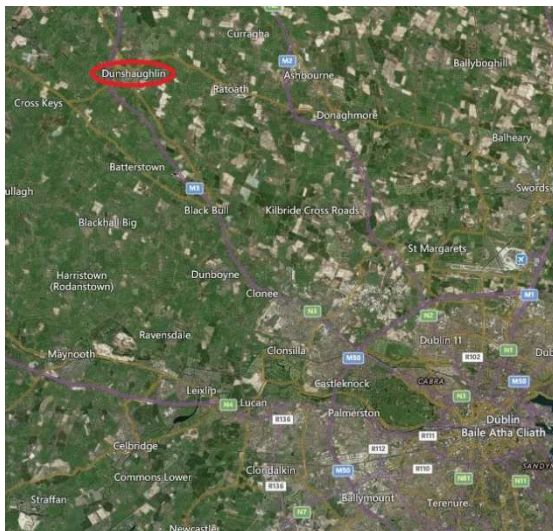
## **1. Introduction**

On the instructions of Waterman Moylan, Site Investigations Ltd (SIL) was appointed to complete a ground investigation at Dunshaughlin, Co. Meath. The investigation was for a residential development of two sites and was completed on behalf of the Client, Castlethorn Construction. The investigation was completed in February 2020.

This report presents the factual geotechnical data obtained from the field and laboratory testing with interpretation of the ground conditions discussed.

## **2. Site Location**

The sites are located to the west of Dunshaughlin, Co. Meath. The northern site is located off the Roestown road and the southern site is located to the east of the R125 linking Dunshaughlin and the M3 motorway. The first map below shows the location of Dunshaughlin to the north west of the capital, Dublin, and the second map shows the location of the two sites in the town.



## **3. Fieldwork**

The fieldworks comprised a programme of cable percussive boreholes, trial pits, soakaway tests and California Bearing Ratio tests. All fieldwork was carried out in accordance with BS 5930:2015, Engineers Ireland GI Specification and Related Document 2<sup>nd</sup> Edition 2016 and Eurocode 7: Geotechnical Design. Laboratory testing has been performed on representative soil samples recovered from the trial pits and these were completed in accordance of BS1377: 1990. The fieldworks comprised of the following:

- 9 No. cable percussive boreholes
- 7 No. trial pits

- 4 No. soakaway tests
- 16 No. California Bearing Ratio tests

### **3.1. Cable Percussive Borehole**

Cable percussion boring was undertaken at 9 No. locations, with four locations at the northern site and five at the southern site. The boreholes were completed using a Dando 150 rig and constructed 200mm diameter holes. The boreholes at the northern site terminated at depths ranging from 1.50mbgl to 3.20mbgl and from 4.20mbgl to 6.30mbgl at the southern site. It was not possible to collect undisturbed samples due to the high gravel content in the soils encountered so bulk disturbed samples were recovered at regular intervals.

To test the strength of the stratum, Standard Penetration Tests (SPT's) were performed at 1.00m intervals in accordance with BS 1377 (1990). In soils with high gravel and cobble content it is appropriate to use a solid cone (60°) (CPT) instead of the split spoon and this was used throughout the testing. The test is completed over 450mm and the cone is driven 150mm into the stratum to ensure that the test is conducted over an undisturbed zone. The cone is then driven the remaining 300mm and the blows recorded to report the N-Value. The report shows the N-Value with the 75mm incremental blows listed in brackets (e.g. BH01 at 1.00mbgl where N=12-(1,1/2,3,3,4)). Where refusal of 50 blows across the test zone was encountered was achieved during testing, the penetration depth is also reported (e.g. BH01 at 3.00mbgl where N=50-(6,10/50 for 100mm)).

At three locations, BH01, BH05 and BH08, a groundwater monitoring standpipe was installed and included a slotted pipe surrounded by a gravel response zone with bentonite seals to prevent downward migration of water from the surface.

The logs are presented in Appendix 1.

### **3.2. Trial Pits**

7 No. trial pits were excavated using a wheeled excavator with three pits completed at the northern site and four in the southern site. The pits were logged and photographed by SIL geotechnical engineer and representative disturbed bulk samples were recovered as the pits were excavated, which were returned to the laboratory for geotechnical testing.

The trial pit logs and photographs are presented in Appendix 2.

### **3.3 Soakaway Tests**

At 4 No. locations, two at each site, soakaway tests were completed and logged by SIL geotechnical engineer. The tests are used to identify possible areas for storm water drainage. The pits were filled with water and the level of the groundwater was recorded over time. As

stipulated by BRE Special Digest 365, the pit should be filled three times and that the final cycle is used to provide the infiltration rate. The time taken for the water level to fall from 75% volume to 25% volume is required to calculate the rate of infiltration. However, if the water level does not fall at a steady rate then the test is deemed to have failed and the area is unsuitable for storm water drainage.

The test results and photographs are provided in Appendix 3.

### **3.4. California Bearing Ratio tests**

At sixteen individual locations, six to the north and 10 in the southern site, undisturbed cylindrical mould samples were taken to complete California Bearing Ratio tests in the laboratory. The results facilitate the designing of the access roads and associated areas. These tests were completed to BS1377: 1990: Part 4, Clause 7 'Determination of California Bearing Ratio'. The results are presented as part of Appendix 4 with the geotechnical laboratory test data.

### **3.5. Surveying**

Following completion of all the fieldworks, a survey of the exploratory hole locations was completed using a GeoMax GPS Rover. The data is supplied on each individual log and along with a site plan in Appendix 6.

## **4. Laboratory Testing**

Geotechnical laboratory testing was completed on representative soil samples in accordance with BS 1377 (1990). Testing included:

- 2 No. Moisture contents
- 2 No. Atterberg limits
- 2 No. Particle size gradings
- 3 No. pH, sulphate and chloride content

Environmental testing was completed by ALS Environmental Ltd. and consists of the following:

- 4 No. Suite I analysis
- 3 No. loss on ignition tests

The geotechnical laboratory test results are presented in Appendix 4 with the environmental tests reported in Appendix 5.

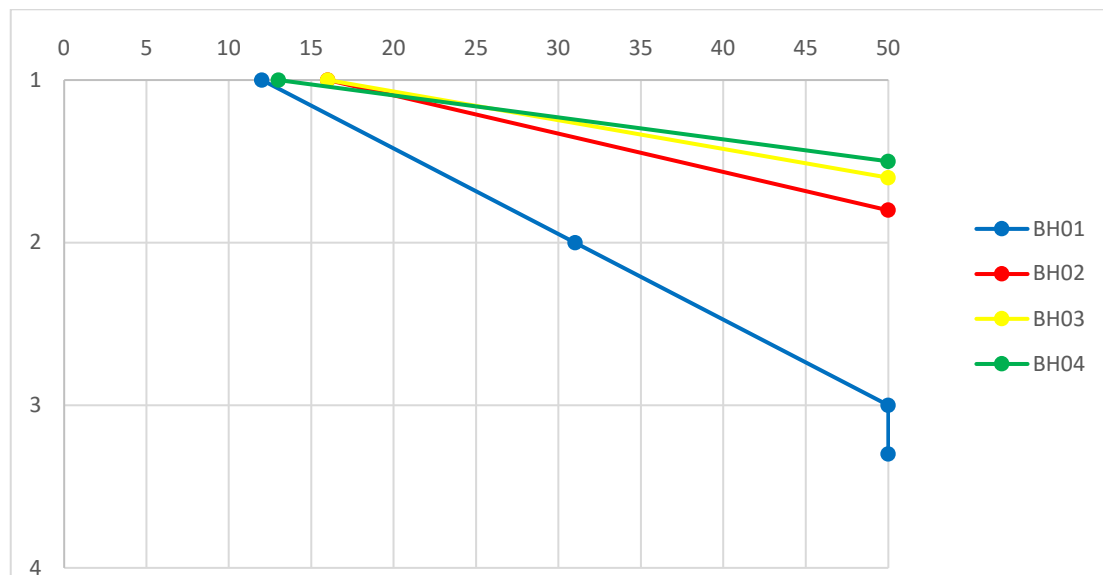
## 5. Ground Conditions

### 5.1. Northern Site

#### 5.1.1. Overburden

The natural ground conditions are dominated by cohesive CLAY soils and the boreholes terminated at depths ranging from 1.50mbgl to 3.20mbgl with the trial pits terminating due to boulder obstructions between 1.00mbgl and 2.40mbgl. It is unknown if the obstructions forcing termination are large boulders or weathered bedrock and rotary core drilling would be required to confirm this.

The SPT N-values are consistent with values of 12 to 16 recorded at 1.00mbgl. BH01 increased to 31 at 2.00mbgl whilst the remaining boreholes terminated above this depth. The graph below shows the SPT N-value vs depth.



The laboratory tests of the soil tested confirm that CLAY soils with low plasticity index of 14% recorded. The particle size distribution curve shows poorly sorted straight-line curves with 20% fines content in the soil from this site.

#### 5.1.2. Groundwater

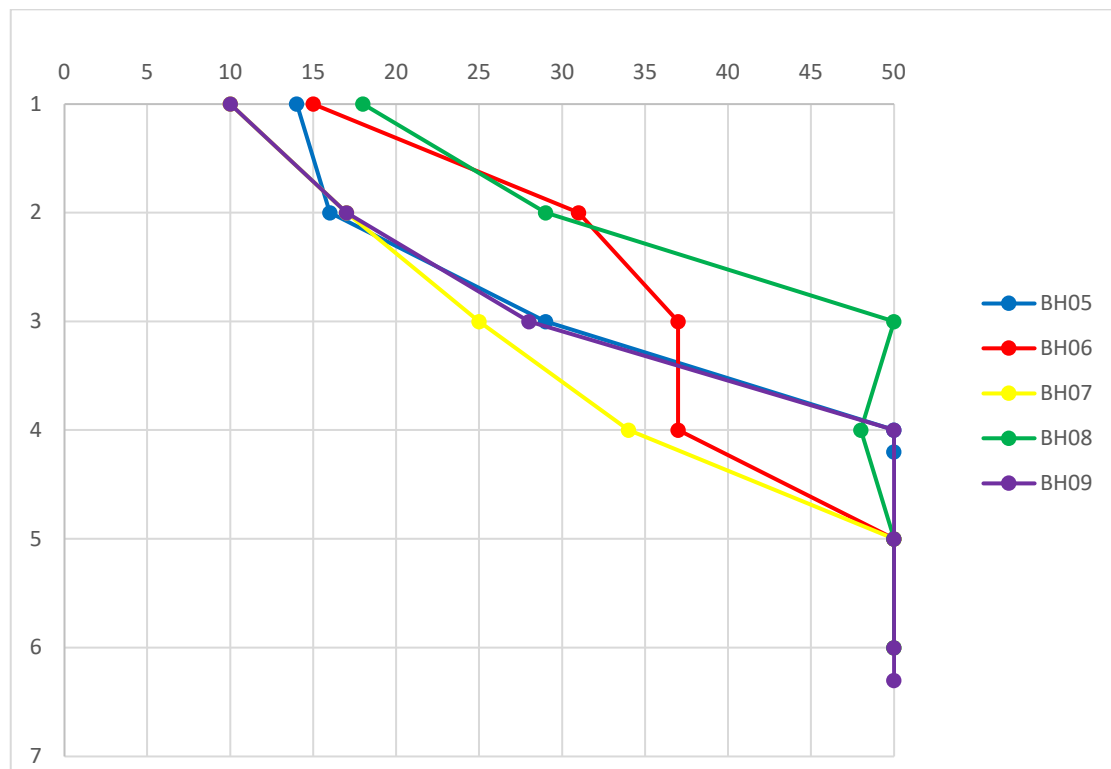
Groundwater details in the boreholes and trial pits during the fieldworks are noted on the logs in Appendices 1 and 2. Groundwater ingresses were not recorded in the boreholes or trial pits during the fieldworks on this site.

## 5.2. Southern Site

### 5.2.1. Overburden

The shallow ground conditions are dominated by cohesive CLAY soils although the boreholes, BH07, BH08 and BH09, did record granular GRAVEL soils from at 3.70mbgl, 3.00mbgl and 2.90mbgl respectively.

The SPT N-values are consistent with values of 10 to 18 recorded at 1.00mbgl. BH05, BH07 and BH09 increased to 16 and 17 at 2.00mbgl whereas BH06 and BH08 increased to 31 and 29 respectively. The graph below shows the SPT N-value vs depth.



The laboratory tests of the soil tested confirm that CLAY soils with low plasticity index of 9% recorded. The particle size distribution curve shows poorly sorted straight-line curves with 36% fines content in the soil from this site.

### 5.1.2. Groundwater

Groundwater details in the boreholes and trial pits during the fieldworks are noted on the logs in Appendices 1 and 2. Groundwater ingresses were recorded in all the boreholes with ingresses recorded between 2.10mbgl (BH06) and 4.00mbgl (BH05). The water level was recorded between 0.30mbgl (BH09) and 1.90mbgl (BH05) at the end of the drilling process. Groundwater was recorded in TP06 and TP07 at 0.45mbgl and 1.10mbgl respectively with seepage and rapid ingresses observed.



## **6. Recommendations and Conclusions**

Please note the following caveats:

*The recommendations given, and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between the exploratory hole locations or below the final level of excavation, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for adjacent unexpected conditions that have not been revealed by the exploratory holes. It is further recommended that all bearing surfaces when excavated should be inspected by a suitably qualified Engineer to verify the information given in this report.*

*Excavated surfaces in clay strata should be kept dry to avoid softening prior to foundation placement. Foundations should always be taken to a minimum depth of 0.50mBGL to avoid the effects of frost action and possible seasonal shrinkage/swelling.*

*If it is intended that on-site materials are to be used as fill, then the necessary laboratory testing should be specified by the Client to confirm the suitability. Also, relevant lab testing should be specified where stability of side slopes to excavations is a concern, or where contamination may be an issue.*

### **6.1. Shallow Foundations**

Due to the unknown depth of foundation and no longer-term groundwater information, this analysis assumes the groundwater will not influence the construction or performance of these foundations.

#### **6.1.1. Northern Site**

At 1.00mbgl, the boreholes encountered brown slightly sandy slightly gravelly silty CLAY with SPT N-values between 12 and 16 and for the purpose of this report, the lower value of 12 has been chosen for analysis in accordance with Eurocode 7.

Using a correlation proposed by Stroud and Butler between SPT N-values and plasticity indices, the SPT N-value can be used to calculate the undrained shear strength. With the low to intermediate plasticity indexes recorded in the laboratory for the soils encountered on site, this correlation is  $C_u=6N$ . Therefore, using the lower value of 12, this indicates that the undrained shear strength of the CLAY is 72kN/m<sup>2</sup>. This can be used to calculate the ultimate bearing capacity, and this has been calculated to be 385kN/m<sup>2</sup>. Finally, a factor of safety is applied and with a factor of 3, an allowable bearing capacity of 128kN/m<sup>2</sup> would be anticipated using the lower SPT values.

The trial pits indicate that excavations in the cohesive soils should be stable for a short time. Regular inspection of temporary excavations should be completed during construction to

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ensure that all slopes are stable. Temporary support should be used on any excavation that will be left open for an extended period.

### **6.1.2. Southern Site**

At 1.00mbgl, the boreholes encountered brown and grey brown slightly sandy slightly gravelly silty CLAY with SPT N-values between 10 and 18 and for the purpose of this report, the lower value of 10 has been chosen for analysis in accordance with Eurocode 7.

Using a correlation proposed by Stroud and Butler between SPT N-values and plasticity indices, the SPT N-value can be used to calculate the undrained shear strength. With the low to intermediate plasticity indexes recorded in the laboratory for the soils encountered on site, this correlation is  $C_u=6N$ . Therefore, using the lower value of 10, this indicates that the undrained shear strength of the CLAY is 60kN/m<sup>2</sup>. This can be used to calculate the ultimate bearing capacity, and this has been calculated to be 324kN/m<sup>2</sup>. Finally, a factor of safety is applied and with a factor of 3, an allowable bearing capacity of 108kN/m<sup>2</sup> would be anticipated using the lower SPT values.

The trial pits indicate that excavations in the cohesive soils should be stable for a short time. However, TP04 did record some instability and therefore, regular inspection of temporary excavations should be completed during construction to ensure that all slopes are stable. Temporary support should be used on any excavation that will be left open for an extended period.

### **6.2. Groundwater**

The caveats below relating to interpretation of groundwater levels should be noted:

*There is always considerable uncertainty as to the likely rates of water ingress into excavations in clayey soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water.*

*Furthermore, water levels noted on the borehole and trial pit logs do not generally give an accurate indication of the actual groundwater conditions as the borehole or trial pit is rarely left open for sufficient time for the water level to reach equilibrium.*

*Also, during boring procedures, a permeable stratum may have been sealed off by the borehole casing, or water may have been added to aid drilling. Therefore, an extended period of groundwater monitoring using any constructed standpipes is required to provide more accurate information regarding groundwater conditions. Finally, groundwater levels vary with time of year, rainfall, nearby construction and tides.*

*Pumping tests would be required to determine likely seepage rates and persistence into excavations taken below the groundwater level. Deep trial pits also aid estimation of seepage rates.*

As discussed previously, groundwater was encountered not recorded in the boreholes or trial pits on the northern site but was recorded in the boreholes on the southern site between 2.10mbgl and 4.00mbgl and in the two southern most pits, TP08 and TP09 at 0.45mbgl and 1.10mbgl.

There is always considerable uncertainty as to the likely rates of water ingress into excavations in cohesive soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water. However, based on this information at the exploratory hole locations to date, it is considered likely that any shallow ingress into excavations of the CLAY will be slow.

If groundwater is encountered during excavations then mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

### **6.3. Soakaway tests**

All of the infiltration tests recorded no infiltration and therefore, failed the specification. The BRE Digest stipulates that the pit should half empty within 24hrs, and extrapolation indicates this condition would not be satisfied. The test was terminated at the end of the first (of a possible three) fill/empty cycle since further testing would give even slower fall rates due to increased soil saturation. The unsuitability of the soils for soakaways is further suggested by the soil descriptions of the materials in this area of the site where the soakaway was completed, i.e. well compacted clay/silt soils.

### **6.4. Pavement Design**

The CBR test results in Appendix 4 indicate CBR values generally ranging from 4.1% to 5.2% although one sample, CBR14, did record a value of 7.3%.

The CBR samples were recovered from 0.50mbgl and inspection of the formation strata should be completed prior to construction of the pavement. Once the exact formation levels are finalised then additional in-situ testing could be completed to assist with the detailed pavement design.

### **6.5. Contamination**

Environmental testing was carried out on four samples from the investigation and the results are shown in Appendix 5. For material to be removed from site, Suite I testing was carried out

to determine if the material is hazardous or non-hazardous and then the leachate results were compared with the published waste acceptance limits of BS EN 12457-2 to determine whether the material on the site could be accepted as 'inert material' by an Irish landfill.

The Waste Classification report created using HazWasteOnline™ software shows that the material tested can be classified as non-hazardous material. The toluene test did exceed the limits of detection but the values are low and therefore the HP3 explosive risk can be discounted due to the low levels and it is not free draining.

Following this analysis of the solid test results, the leachate disposal suite results indicate that the soils tested would generally be able to be treated as Inert Waste.

Four samples were tested for analysis but it cannot be discounted that any localised contamination may have been missed. Any MADE GROUND excavated on site should be stockpiled separately to natural soils to avoid any potential cross contamination of the soils. Additional testing of these soils may be requested by the individual landfill before acceptance and a testing regime designed by an environmental engineer would be recommended to satisfy the landfill.

#### **6.6. Aggressive Ground Conditions**

The chemical test results in Appendix 4 indicate a general pH value between 7.43 and 7.81, which is close to neutral and below the level of 9, therefore no special precautions are required.

The maximum value obtained for water soluble sulphate was 128mg/l as SO<sub>3</sub>. The BRE Special Digest 1:2005 – *'Concrete in Aggressive Ground'* guidelines require SO<sub>4</sub> values and after conversion (SO<sub>4</sub> = SO<sub>3</sub> x 1.2), the maximum value of 154mg/l shows Class 1 conditions and no special precautions are required.

**Appendix 1**  
**Cable Percussive Borehole Logs**

Contract No: 5699	<b>Cable Percussion Borehole Log</b>				Borehole No: <b>BH01</b>
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Contract:	Residential Development	Easting:	695779.910	Date Started:	19/02/2020
Location:	Dunshaughlin, Co. Meath	Northing:	753048.871	Date Completed:	19/02/2020
Client:	Castlethorn Construction	Elevation:	105.07	Drilled By:	J. O'Toole
Engineer:	Waterman Moylan	Borehole Diameter:	200mm	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill
Scale	Depth			Scale	Depth	Depth	Type	Result		
	0.20	TOPSOIL.		105.0						
	0.5	Firm brown sandy slightly gravelly silty CLAY with low cobble content.		104.87						
	1.10	Stiff brown slightly sandy slightly gravelly silty CLAY with low cobble content.		104.5						
				104.0	1.00	B	JOT03			
				103.97	1.00	C	N=12 (1,1/2,3,3,4)			
				103.5						
				103.0	2.00	B	JOT04			
				103.0	2.00	C	N=31 (2,4/7,7,9,8)			
				102.5						
	2.90	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble content.		102.17						
	3.20	Obstruction - possible boulders. End of Borehole at 3.20m		102.0	3.00	B	JOT05			
				101.87	3.00	C	50 (6,10/50 for 100mm)			
					3.30	C	50 (25 for 5mm/50 for 0mm)			
				101.5						
				101.0						
				100.5						
				100.0						
				99.5						
				99.0						
				98.5						
				98.0						
				97.5						
				97.0						
				96.5						
				96.0						
				95.5						

	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:	Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:		
	3.20	3.20	01:00				19/02	3.20	Dry	0.00	1.10	Solid Slotted	0.00	0.80	Bentonite Gravel		

Contract No: 5699		<b>Cable Percussion Borehole Log</b>							Borehole No: <b>BH02</b>									
Contract:		Residential Development			Easting:		695848.290		Date Started:		19/02/2020							
Location:		Dunshaughlin, Co. Meath			Northing:		752983.063		Date Completed:		19/02/2020							
Client:		Castlethorn Construction			Elevation:		106.90		Drilled By:		J. O'Toole							
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth					Scale	Depth	Depth	Type	Result								
	0.20	TOPSOIL.					106.70											
0.5		Firm brown sandy slightly gravelly silty CLAY with low cobble content.				106.5												
1.0	1.20	Stiff brown slightly sandy slightly gravelly silty CLAY with low cobble content.				106.0		1.00	B	JOT02 N=16 (1,1/2,4,5,5)								
1.5				105.70			1.00	C										
1.80	1.80	Obstruction - possible boulders.				105.5												
2.0	1.90	End of Borehole at 1.90m			105.0	105.10	1.80	C	50 (25 for 5mm/50 for 0mm)									
						105.00												
						104.5												
						104.0												
						103.5												
						103.0												
						102.5												
						102.0												
						101.5												
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						98.5												
						98.0												
						97.5												
						97.0												
		Chiselling:		Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	-	
		1.80	1.90	01:00				19/02	1.90	Dry				0.00	1.90	Arisings		

Contract No: 5699		<b>Cable Percussion Borehole Log</b>							Borehole No: <b>BH03</b>									
Contract:		Residential Development			Easting:		695671.980		Date Started:		20/02/2020							
Location:		Dunshaughlin, Co. Meath			Northing:		752975.012		Date Completed:		20/02/2020							
Client:		Castlethorn Construction			Elevation:		103.73		Drilled By:		J. O'Toole							
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth					Scale	Depth	Depth	Type	Result								
0.20		TOPSOIL.				103.5	103.53											
0.5		Firm brown sandy slightly gravelly silty CLAY with low cobble content.				103.0												
1.10		Stiff brown slightly sandy slightly gravelly silty CLAY with low cobble content.				102.5	102.63	1.00	B	JOT06								
1.50		Obstruction - possible boulders.				102.23		1.00	C	N=16 (1,2/3,4,4,5)								
1.60		End of Borehole at 1.60m				102.0	102.13	1.60	C	50 (25 for 5mm/50 for 0mm)								
2.0						101.5												
2.5						101.0												
3.0						100.5												
3.5						100.0												
4.0						99.5												
4.5						99.0												
5.0						98.5												
5.5						98.0												
6.0						97.5												
6.5						97.0												
7.0						96.5												
7.5						96.0												
8.0						95.5												
8.5						95.0												
9.0						94.5												
9.5						94.0												
		Chiselling:		Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	-	
		1.50	1.60	01:00				20/02	1.60	Dry				0.00	1.60	Arisings		



Contract No: 5699		Cable Percussion Borehole Log							Borehole No: BH04									
Contract:		Residential Development			Easting:		695769.590		Date Started:		18/02/2020							
Location:		Dunshaughlin, Co. Meath			Northing:		752933.251		Date Completed:		18/02/2020							
Client:		Castlethorn Construction			Elevation:		104.04		Drilled By:		J. O'Toole							
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL							
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill						
Scale	Depth					Scale	Depth	Depth	Type	Result								
0.20		TOPSOIL.				103.84												
0.5		Firm brown slightly sandy slightly gravelly silty CLAY with low cobble content.				103.5												
1.0						103.0		1.00	B	JOT01								
								1.00	C	N=13 (2,1/3,3,4,3)								
1.50		Obstruction - possible boulders.				102.54		1.50	C	50 (25 for 5mm/50 for 0mm)								
1.50		End of Borehole at 1.50m				102.54												
2.0						102.0												
2.5						101.5												
3.0						101.0												
3.5						100.5												
4.0						100.0												
4.5						99.5												
5.0						99.0												
5.5						98.5												
6.0						98.0												
6.5						97.5												
7.0						97.0												
7.5						96.5												
8.0						96.0												
8.5						95.5												
9.0						95.0												
9.5						94.5												
		Chiselling:		Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
		From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	-	
		1.50	1.50	01:00				18/02	1.50	Dry				0.00	1.50	Arisings		

Contract No: 5699	<b>Cable Percussion Borehole Log</b>				Borehole No: <b>BH05</b>
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Contract:	Residential Development	Easting:	695720.420	Date Started:	20/02/2020
Location:	Dunshaughlin, Co. Meath	Northing:	752475.726	Date Completed:	20/02/2020
Client:	Castlethorn Construction	Elevation:	96.16	Drilled By:	J. O'Toole
Engineer:	Waterman Moylan	Borehole Diameter:	200mm	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill
Scale	Depth			Scale	Depth	Depth	Type	Result		
	0.20	TOPSOIL.		96.0	95.96					
	0.5	Brown sandy slightly gravelly silty CLAY with low cobble content.		95.5	95.36					
	0.80	Stiff grey brown slightly sandy slightly gravelly silty CLAY with low cobble content.		95.0		1.00	B	JOT07		
	1.0			95.0		1.00	C	N=14 (1,2/2,3,4,5)		
	1.5			94.5						
	2.0			94.0		2.00	B	JOT08		
	2.5			94.0		2.00	C	N=16 (2,2/3,4,4,5)		
	2.50	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble content.		93.5	93.66					
	3.0			93.0		3.00	B	JOT09		
	3.5			93.0		3.00	C	N=29 (2,4/7,7,7,8)		
	4.00	Obstruction - possible boulders.		92.5						
	4.20	End of Borehole at 4.20m		92.0	92.16	4.00	B	JOT10		
	4.5			92.0	91.96	4.00	C	50 (25 for 50mm/50 for 25mm)		
	5.0			92.0		4.20	C	50 (25 for 5mm/50 for 0mm)		
	5.5			91.5						
	6.0			91.0						
	6.5			90.5						
	7.0			90.0						
	7.5			89.5						
	8.0			89.0						
	8.5			88.5						
	9.0			88.0						
	9.5			87.5						
				87.0						
				86.5						

	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:	Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:		
	4.00	4.20	01:00	4.00	3.80	NS	20/02	4.20	1.90	0.00	1.30	Solid Slotted	0.00	1.00	Bentonite Gravel		

Contract No: 5699	<b>Cable Percussion Borehole Log</b>				Borehole No: <b>BH06</b>
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Contract:	Residential Development	Easting:	695799.100	Date Started:	25/02/2020
Location:	Dunshaughlin, Co. Meath	Northing:	752355.443	Date Completed:	25/02/2020
Client:	Castlethorn Construction	Elevation:	95.24	Drilled By:	J. O'Toole
Engineer:	Waterman Moylan	Borehole Diameter:	200mm	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill
Scale	Depth			Scale	Depth	Depth	Type	Result		
	0.20	TOPSOIL.		95.0	95.04					
	0.5	Dark brown sandy slightly gravelly silty CLAY.		94.5						
	0.90	Stiff grey brown slightly sandy slightly gravelly silty CLAY with low cobble content.		94.0	94.34	1.00	B	JOT29		
	1.5			93.5		1.00	C	N=15 (2,2/3,4,4,4)		
	2.0			93.0		2.00	B	JOT30		
	2.5			92.5	92.64	2.00	C	N=31 (3,4/7,7,9,8)		
	3.0	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble content.		92.0		3.00	B	JOT31		
	3.5			91.5		3.00	C	N=37 (4,5/7,9,10,11)		
	4.0			91.0		4.00	B	JOT32		
	4.5			90.5		4.00	C	N=37 (3,6/7,7,11,12)		
	5.0	Obstruction - possible boulders.		90.0	90.24	5.00	B	JOT33		
	5.10	End of Borehole at 5.10m		89.5	90.14	5.00	C	50 (25 for 5mm/50 for 0mm)		
	5.5			89.0						
	6.0			88.5						
	6.5			88.0						
	7.0			87.5						
	7.5			87.0						
	8.0			86.5						
	8.5			86.0						
	9.0			85.5						

	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:	Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:		
	4.60	4.70	00:45	2.10	1.90	NS	25/02	5.10	0.80				0.00	5.10	Arisings		

Contract No: 5699	<b>Cable Percussion Borehole Log</b>				Borehole No: <b>BH07</b>
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Contract:	Residential Development	Easting:	695869.490	Date Started:	25/02/2020
Location:	Dunshaughlin, Co. Meath	Northing:	752302.818	Date Completed:	25/02/2020
Client:	Castlethorn Construction	Elevation:	95.49	Drilled By:	J. O'Toole
Engineer:	Waterman Moylan	Borehole Diameter:	200mm	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill
Scale	Depth			Scale	Depth	Depth	Type	Result		
	0.20	TOPSOIL.			95.29					
	0.5	Dark brown sandy slightly gravelly silty CLAY.			95.0					
	0.70	Firm brown sandy slightly gravelly silty CLAY with low cobble content.			94.79					
	1.0				94.5	1.00	B	JOT23 N=10 (1,1/2,2,3,3)		
	1.60				94.0	1.00	C			
	1.5	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble content.			93.89					
	2.0				93.5	2.00	B	JOT24 N=17 (1,2/4,4,4,5)		
	2.5				93.0	2.00	C			
	3.0				92.5	3.00	B	JOT25 N=25 (2,4/5,6,7,7)		
	3.5				92.0	3.00	C			
	3.70	Dense grey brown silty sandy GRAVEL with medium cobble content.			91.79					
	4.0				91.5	4.00	B	JOT26 N=34 (3,4/7,9,8,10)		
	4.5				91.0	4.00	C			
	5.0				90.5	5.00	B	JOT27 N=50 (6,9/50 for 255mm)		
	5.5				90.0	5.00	C			
	6.0	Obstruction - possible boulders.			89.5	6.00	B	JOT28 50 (25 for 95mm/50 for 5mm)		
	6.10	End of Borehole at 6.10m			89.39	6.00	C			
	6.5				89.0					
	7.0				88.5					
	7.5				88.0					
	8.0				87.5					
	8.5				87.0					
	9.0				86.5					
	9.5				86.0					

	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:	Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:		
	3.70	3.80	00:45	3.70	3.10	NS	25/02	6.10	0.50				0.00	6.10	Arisings		

Contract No: 5699	<b>Cable Percussion Borehole Log</b>				Borehole No: <b>BH08</b>
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Contract:	Residential Development	Easting:	695790.860	Date Started:	21/02/2020
Location:	Dunshaughlin, Co. Meath	Northing:	752158.452	Date Completed:	21/02/2020
Client:	Castlethorn Construction	Elevation:	93.92	Drilled By:	J. O'Toole
Engineer:	Waterman Moylan	Borehole Diameter:	200mm	Status:	FINAL

Depth (m)		Stratum Description	Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill
Scale	Depth			Scale	Depth	Depth	Type	Result		
	0.20	TOPSOIL.			93.72					
	0.5	MADE GROUND: dark brown silty organic gravel.			93.5					
	0.60				93.32					
	0.80	MADE GROUND: brown grey fine gravel.			93.12					
	1.0	Stiff grey brown slightly sandy slightly gravelly silty CLAY with low cobble content.			93.0	1.00	B	JOT11		
	1.5				92.5	1.00	C	N=18 (2,3/3,4,5,6)		
	1.80				92.0					
	2.0	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble content.			92.0	2.00	B	JOT12		
	2.5				91.5	2.00	C	N=29 (2,4/7,7,7,8)		
	2.50	Grey brown gravelly SAND with high cobble content.			91.5					
	3.0				91.0					
	3.00	Dense grey brown silty sandy GRAVEL with medium cobble content.			90.92	3.00	B	JOT13		
	3.5				90.5	3.00	C	50 (4,7/50 for 200mm)		
	4.0				90.0					
	4.5				89.5	4.00	B	JOT14		
	5.0				89.0	4.00	C	N=48 (4,7/11,12,11,14)		
	5.5				88.5					
	5.80				88.0	5.00	B	JOT15		
	6.0	Obstruction - possible boulders.			88.0	5.00	C	N=50 (5,10/12,12,13,13)		
	6.00	End of Borehole at 6.00m			87.92	6.00	B	JOT16		
	6.5				87.5	6.00	C	50 (25 for 5mm/50 for 0mm)		
	7.0				87.0					
	7.5				86.5					
	8.0				86.0					
	8.5				85.5					
	9.0				85.0					
	9.5				84.5					
					84.0					

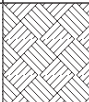
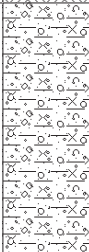
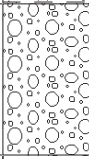

	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:	Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:		
	3.40	3.50	00:45	3.00	2.60	NS	21/02	6.00	0.50	0.00	1.50	Solid	0.00	1.00	Bentonite		
5.80	6.00	01:00							1.50	6.00	Slotted	1.00	6.00	Gravel			

Contract No: 5699		Cable Percussion Borehole Log							Borehole No: BH09				
Contract:		Residential Development			Easting:		695926.770		Date Started:		24/02/2020		
Location:		Dunshaughlin, Co. Meath			Northing:		752232.427		Date Completed:		24/02/2020		
Client:		Castlethorn Construction			Elevation:		95.29		Drilled By:		J. O'Toole		
Engineer:		Waterman Moylan			Borehole Diameter:		200mm		Status:		FINAL		
Depth (m)		Stratum Description			Legend	Level (mOD)		Samples and Insitu Tests				Water Strike	Backfill
Scale	Depth					Scale	Depth	Depth	Type	Result			
0.20	0.20	TOPSOIL.				95.09	95.09						
0.5	0.5	Dark brown sandy slightly gravelly organic SILT.				94.69	94.69						
1.0	0.60	Firm grey sandy slightly gravelly silty CLAY with low cobble content.				94.5	94.5	1.00	B	JOT17			
1.5	1.0					94.0	94.0	1.00	C	N=10 (1,2/2,3,3,2)			
2.0	1.80	Stiff black slightly sandy slightly gravelly silty CLAY with low cobble content.				93.5	93.49	2.00	B	JOT18			
2.5	2.0					93.0	93.0	2.00	C	N=17 (2,4/4,5,4,4)			
3.0	2.90	Medium dense becoming dense grey brown silty sandy GRAVEL with medium cobble content.				92.5	92.39	3.00	B	JOT19			
3.5	3.0					92.0	92.0	3.00	C	N=28 (2,4/5,7,7,9)			
4.0	4.0					91.5	91.5	4.00	B	JOT20			
4.5	4.5					91.0	91.0	4.00	C	50 (9,11/50 for 105mm)			
5.0	5.0					90.5	90.5	5.00	B	JOT21			
5.5	5.5					90.0	90.0	5.00	C	N=50 (6,11/50 for 250mm)			
6.0	6.0					89.5	89.5	6.00	B	JOT22			
6.5	6.20	Obstruction - possible boulders.				89.0	89.09	6.00	C	50 (7,14/50 for 50mm)			
7.0	6.30	End of Borehole at 6.30m				88.5	88.99	6.30	C	50 (25 for 5mm/50 for 0mm)			
7.5	7.5					88.0	88.0						
8.0	8.0					87.5	87.5						
8.5	8.5					87.0	87.0						
9.0	9.0					86.5	86.5						
9.5	9.5					86.0	86.0						
						85.5	85.5						

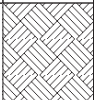
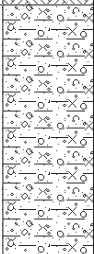
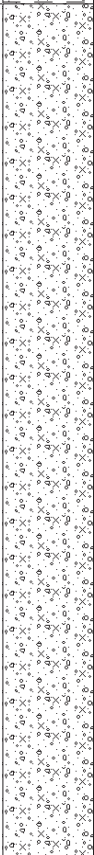

  

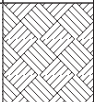
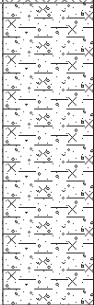
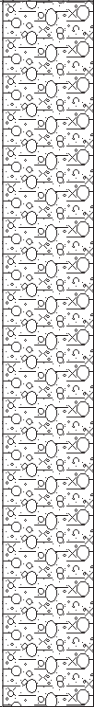

	Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:		Legend: B: Bulk D: Disturbed U: Undisturbed ES: Environmental W: Water C: Cone SPT S: Split spoon SPT
	From:	To:	Time:	Strike:	Rose:	Depth Sealed:	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	-		
	1.60	1.70	00:45	2.90	2.50	NS	24/02	6.30	0.30				0.00	6.30	Arisings			

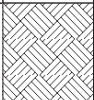
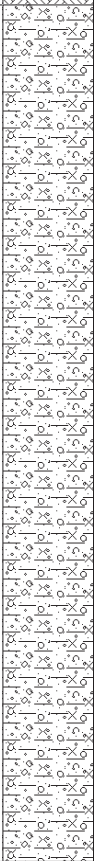
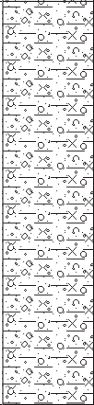

**Appendix 2**  
**Trial Pit Logs and Photographs**

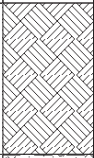
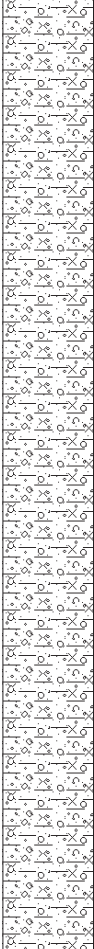
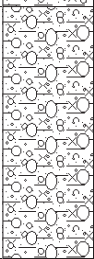

Contract No: 5699		<b>Trial Pit Log</b>				Trial Pit No: <b>TP01</b>			
Contract:	Residential Development	Easting:	695759.260	Date:	14/02/2020				
Location:	Dunshaughlin, Co. Meath	Northing:	752895.191	Excavator:	4T Tracked Excavator				
Client:	Castlethorn Construction	Elevation:	103.64	Logged By:	M. Kaliski				
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	1.80 x 0.60 x 1.00	Status:	FINAL				
Level (mbgl)	Stratum Description		Legend	Level (mOD)		Samples / Field Tests		Water Strike	
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.		103.5					
0.20		Firm brown slightly sandy gravelly silty CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.		103.44					
0.5						0.50	ES	MK01	
0.70		Dark grey silty sandy gravelly angular COBBLES and BOULDERS of limestone. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone.		103.0		0.60	B	MK02	
1.00		Pit terminated at 1.00m		102.94					
				102.64					
				102.5					
				102.0					
				101.5					
				101.0					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders.	Pit walls stable.	Dry	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

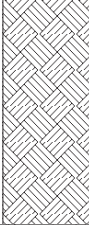
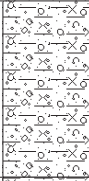
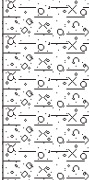
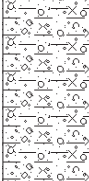
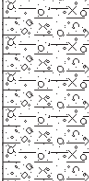
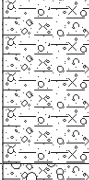
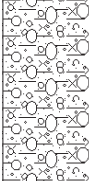

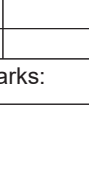



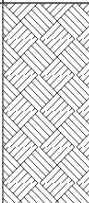

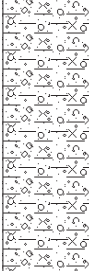


Contract No: 5699		<b>Trial Pit Log</b>				Trial Pit No: <b>TP02</b>			
Contract:		Residential Development	Easting:	695735.616	Date:	14/02/2020			
Location:		Dunshaughlin, Co. Meath	Northing:	753023.483	Excavator:	4T Tracked Excavator			
Client:		Castlethorn Construction	Elevation:	104.54	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	2.10 x 0.60 x 2.40	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.		104.5					
0.20		Soft becoming firm brown slightly sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.		104.34					
0.5				104.0	0.50	ES	MK03		
0.70		Grey brown silty sandy fine to coarse, angular to subangular GRAVEL of limestone with high cobble content interbedded with sandy gravelly clay. Sand is fine to coarse. Cobbles are angular to subangular of limestone.		103.84					
1.0				103.5	1.00	B	MK04		
1.5				103.0					
2.0				102.5	2.00	B	MK05		
2.40		Pit terminated at 2.40m		102.14					
2.5				102.0					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders.	Pit walls stable.	Dry	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 5699		<b>Trial Pit Log</b>				Trial Pit No: <b>TP03</b>					
Contract:		Residential Development		Easting:	695871.684	Date:	14/02/2020				
Location:		Dunshaughlin, Co. Meath		Northing:	753033.093	Excavator:	4T Tracked Excavator				
Client:		Castlethorn Construction		Elevation:	106.90	Logged By:	M. Kaliski				
Engineer:		Waterman Moylan		Dimensions (LxWxD) (m):	2.10 x 0.60 x 2.20	Status:	FINAL				
Level (mbgl)		Stratum Description			Legend	Level (mOD)		Samples / Field Tests		Water Strike	
Scale:	Depth					Scale:	Depth:	Depth	Type	Result	
	0.20	TOPSOIL.					106.70				
	0.5	Soft becoming firm brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone.					106.5				
	0.80	Firm becoming stiff grey brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular and tabular of limestone (up to 400mm diameter).					106.10				
	1.0						106.0	1.00	B	MK06	
	1.5						105.5				
	2.0						105.0	2.00	B	MK07	
	2.20	Pit terminated at 2.20m					104.70				
	2.5						104.5				
							104.0				
	Termination:		Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:				
	Obstruction - possible boulders.		Pit walls stable.	Dry	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental				

Contract No: 5699		<b>Trial Pit Log</b>				Trial Pit No: <b>TP04</b>			
Contract:	Residential Development	Easting:	695836.347	Date:	14/02/2020				
Location:	Dunshaughlin, Co. Meath	Northing:	752481.578	Excavator:	4T Tracked Excavator				
Client:	Castlethorn Construction	Elevation:	95.72	Logged By:	M. Kaliski				
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	2.90 x 0.80 x 2.70	Status:	FINAL				
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.							
0.20		Firm becoming stiff dark grey brown mottled slightly sandy slightly gravelly silty CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.		95.5	95.52				
0.5						0.50	ES	MK08	
1.0						1.00	B	MK09	
1.5									
1.90		Stiff dark grey slightly sandy gravelly silty CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.							
2.0						2.00	B	MK10	
2.5									
2.70		Pit terminated at 2.70m							
	Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:			Key:		
	Obstruction - possible boulders.	Minor pit wall instability.	Dry	-			B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 5699		<b>Trial Pit Log</b>				Trial Pit No: <b>TP05</b>			
Contract:		Residential Development		Easting:	695703.699	Date:	14/02/2020		
Location:		Dunshaughlin, Co. Meath		Northing:	752366.249	Excavator:	4T Tracked Excavator		
Client:		Castlethorn Construction		Elevation:	95.07	Logged By:	M. Kaliski		
Engineer:		Waterman Moylan		Dimensions (LxWxD) (m):	2.80 x 0.80 x 2.70	Status:	FINAL		
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.		95.0					
0.30		Firm becoming stiff grey brown mottled slightly sandy gravelly silty CLAY with medium cobble content and occasional sand and gravel laminas. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.		94.77					
0.5				94.5					
1.0				94.0	1.00	B	MK11		
1.5				93.5					
2.0				93.0	2.00	B	MK12		
2.20		Stiff dark grey slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 400mm diameter).		92.87					
2.5				92.5	2.50	B	MK13		
2.70		Pit terminated at 2.70m		92.37					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders.	Pit walls stable.	Dry	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 5699		<b>Trial Pit Log</b>				Trial Pit No: <b>TP06</b>			
Contract:		Residential Development	Easting:	695856.180	Date:	14/02/2020			
Location:		Dunshaughlin, Co. Meath	Northing:	752324.360	Excavator:	4T Tracked Excavator			
Client:		Castlethorn Construction	Elevation:	95.07	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	2.60 x 0.70 x 2.70	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.		95.0					
0.45		Firm light grey brown mottled slightly sandy gravelly silty CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.		94.62					
0.80		Firm becoming stiff grey brown slightly sandy gravelly silty CLAY with high cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.		94.27					
1.50				94.0					
2.20		Stiff dark grey slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 400mm diameter).		93.5		1.50	B	MK15	
2.50				93.0					
2.70		Pit terminated at 2.70m		92.87					
				92.5		2.50	B	MK16	
				92.37					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders.	Pit walls stable.	0.45 Seepage	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Contract No: 5699		<b>Trial Pit Log</b>				Trial Pit No: <b>TP07</b>			
Contract:		Residential Development	Easting:	695870.674	Date:	14/02/2020			
Location:		Dunshaughlin, Co. Meath	Northing:	752168.821	Excavator:	4T Tracked Excavator			
Client:		Castlethorn Construction	Elevation:	95.08	Logged By:	M. Kaliski			
Engineer:		Waterman Moylan	Dimensions (LxWxD) (m):	2.10 x 0.80 x 1.20	Status:	FINAL			
Level (mbgl)		Stratum Description	Legend	Level (mOD)		Samples / Field Tests			Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type	Result	
		TOPSOIL.		95.0					
0.40		Soft light grey beige slightly sandy slightly gravelly clayey SILT. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone.		94.68					
0.50		Firm grey slightly sandy gravelly silty CLAY with low cobble content and frequent silty sand laminas. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles are angular to subangular of limestone.		94.58	0.50	ES	MK17		
				94.5					
1.10		Dark grey silty sandy gravelly angular COBBLES and BOULDERS of limestone. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone.		94.0	1.00	B	MK18		▼
1.20		Pit terminated at 1.20m		93.98					
				93.88					
				93.5					
				93.0					
				92.5					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - possible boulders.	Pit walls stable.	1.10 Rapid	-		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

**TP01 Sidewall**



**TP01 Spoil**



**TP02 Sidewall**



**TP02 Spoil**





**TP03 Sidewall**



**TP03 Spoil**



**TP04 Sidewall**



**TP04 Spoil**



**TP05 Sidewall**



**TP05 Spoil**



**TP06 Sidewall**



**TP06 Spoil**



**TP07 Sidewall**



**TP07 Spoil**



**Appendix 3**  
**Soakaway Test Results and Photographs**

# SOAKAWAY TEST



<b>Project Reference:</b>	5699
<b>Contract name:</b>	Residential Development
<b>Location:</b>	Dunshaughlin, Co. Meath
<b>Test No:</b>	SA01
<b>Date:</b>	14/02/2020

**Ground Conditions**

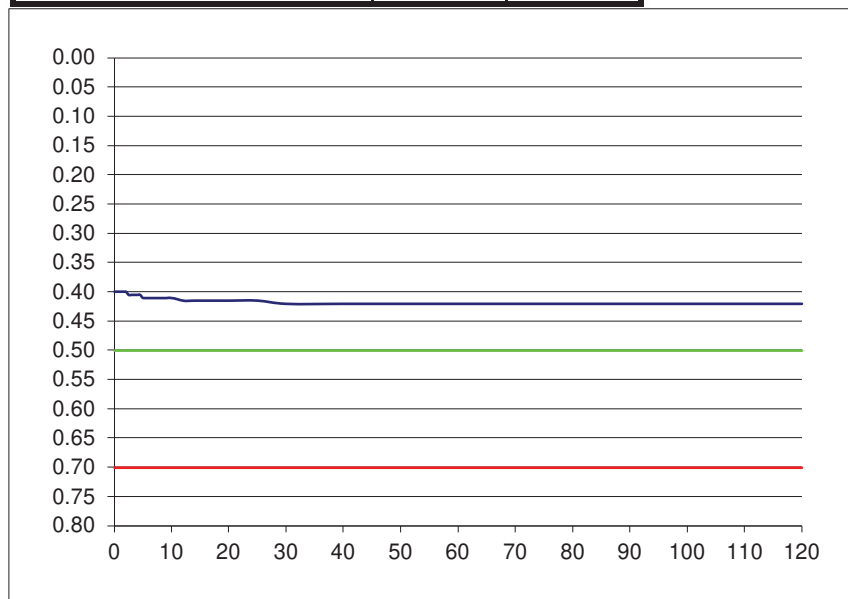
From	To	
0.00	0.10	TOPSOIL.
0.10	0.30	Firm light brown slightly silty slightly gravelly sandy CLAY.
0.30	0.70	Firm brown sandy slightly gravelly CLAY with high cobble content.
0.70	0.80	Dark grey silty sandy gravelly COBBLES and BOULDERS.

**Remarks:**

Obstruction encountered at 0.80mbgl - pit terminated and test completed.

Elapsed Time (mins)	Fall of Water (m)	<b>Pit Dimensions (m)</b>		
0	0.40	Length (m)	1.90	m
0.5	0.40	Width (m)	0.60	m
1	0.40	Depth	0.80	m
1.5	0.40	<b>Water</b>		
2	0.40	Start Depth of Water	0.40	m
2.5	0.41	Depth of Water	0.40	m
3	0.41	75% Full	0.50	m
3.5	0.41	25% Full	0.70	m
4	0.41	75%-25%	0.20	m
4.5	0.41	Volume of water (75%-25%)	<b>0.23</b>	m <sup>3</sup>
5	0.41	Area of Drainage	<b>4.00</b>	m <sup>2</sup>
6	0.41	Area of Drainage (75%-25%)	<b>2.14</b>	m <sup>2</sup>
7	0.41	Time		
8	0.41	75% Full	N/A	min
9	0.41	25% Full	N/A	min
10	0.41	Time 75% to 25%	N/A	min
12	0.42	Time 75% to 25% (sec)	N/A	sec

14	0.42
16	0.42
18	0.42
20	0.42
25	0.42
30	0.42
40	0.42
50	0.42
60	0.42
75	0.42
90	0.42
120	0.42



**f = Fail or**

**Fail**  
**m/min** or **m/s**

# SOAKAWAY TEST



<b>Project Reference:</b>	5699
<b>Contract name:</b>	Residential Development
<b>Location:</b>	Dunshaughlin, Co. Meath
<b>Test No:</b>	SA02
<b>Date:</b>	14/02/2020

### Ground Conditions

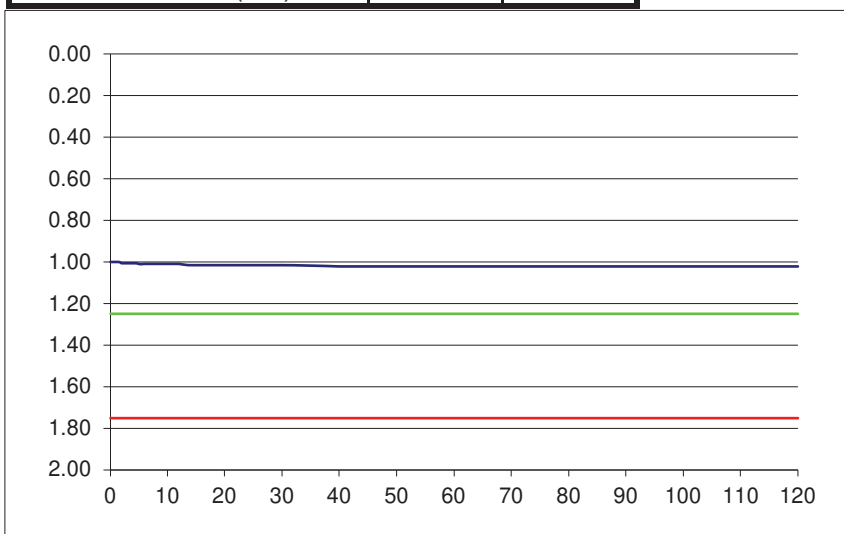
From	To	
0.00	0.10	TOPSOIL.
0.10	1.20	Soft becoming firm light brown slightly silty slightly gravelly sandy CLAY with low cobble content.
1.20	1.80	Firm light brown slightly sandy gravelly silty CLAY with high cobble content.
1.80	2.00	Stiff light brown slightly sandy gravelly silty CLAY with high cobble and low boulder content.

### Remarks:

-

Elapsed Time (mins)	Fall of Water (m)
0	1.00
0.5	1.00
1	1.00
1.5	1.00
2	1.01
2.5	1.01
3	1.01
3.5	1.01
4	1.01
4.5	1.01
5	1.01
6	1.01
7	1.01
8	1.01
9	1.01
10	1.01
12	1.01
14	1.02
16	1.02
18	1.02
20	1.02
25	1.02
30	1.02
40	1.02
50	1.02
60	1.02
75	1.02
90	1.02
120	1.02

Pit Dimensions (m)	
Length (m)	1.80 m
Width (m)	0.60 m
Depth	2.00 m
Water	
Start Depth of Water	1.00 m
Depth of Water	1.00 m
75% Full	1.25 m
25% Full	1.75 m
75%-25%	0.50 m
Volume of water (75%-25%)	<b>0.54</b> m <sup>3</sup>
Area of Drainage	<b>9.60</b> m <sup>2</sup>
Area of Drainage (75%-25%)	<b>3.48</b> m <sup>2</sup>
Time	
75% Full	N/A min
25% Full	N/A min
Time 75% to 25%	<b>N/A</b> min
Time 75% to 25% (sec)	<b>N/A</b> sec



**f =** Fail or  
m/min

Fail  
m/s



# SOAKAWAY TEST



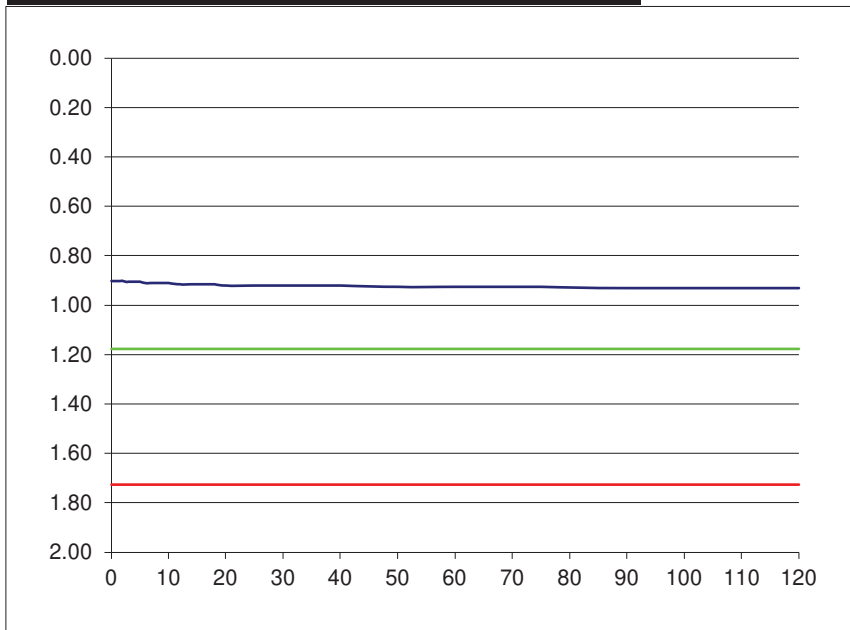
<b>Project Reference:</b>	5699
<b>Contract name:</b>	Residential Development
<b>Location:</b>	Dunshaughlin, Co. Meath
<b>Test No:</b>	SA03
<b>Date:</b>	14/02/2020

<b>Ground Conditions</b>		
From	To	
0.00	0.30	TOPSOIL.
0.30	0.60	Soft becoming firm slightly sandy gravelly silty CLAY with high cobble
0.60	2.00	Firm becoming stiff slightly sandy gravelly silty CLAY with high cobble

**Remarks:**  
-

Elapsed Time (mins)	Fall of Water (m)
0	0.90
0.5	0.90
1	0.90
1.5	0.90
2	0.90
2.5	0.91
3	0.91
3.5	0.91
4	0.91
4.5	0.91
5	0.91
6	0.91
7	0.91
8	0.91
9	0.91
10	0.91
12	0.92
14	0.92
16	0.92
18	0.92
20	0.92
25	0.92
30	0.92
40	0.92
50	0.93
60	0.93
75	0.93
90	0.93
120	0.93

<b>Pit Dimensions (m)</b>	
Length (m)	1.60 m
Width (m)	0.60 m
Depth	2.00 m
<b>Water</b>	
Start Depth of Water	0.90 m
Depth of Water	1.10 m
75% Full	1.18 m
25% Full	1.73 m
75%-25%	0.55 m
Volume of water (75%-25%)	<b>0.53</b> m <sup>3</sup>
Area of Drainage	<b>8.80</b> m <sup>2</sup>
Area of Drainage (75%-25%)	<b>3.38</b> m <sup>2</sup>
<b>Time</b>	
75% Full	N/A min
25% Full	N/A min
Time 75% to 25%	<b>N/A</b> min
Time 75% to 25% (sec)	<b>N/A</b> sec



**f = Fail or Fail**  
**m/min m/s**

# SOAKAWAY TEST



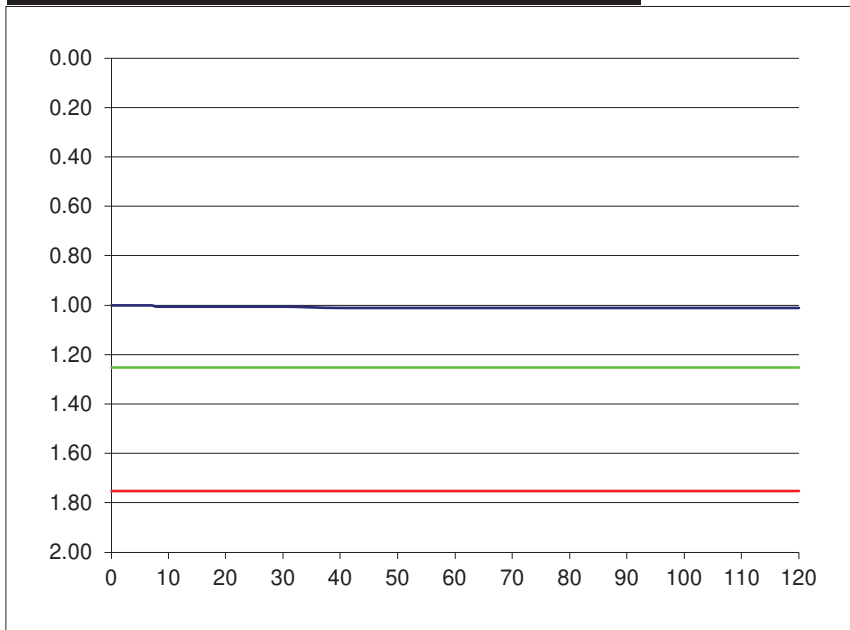
<b>Project Reference:</b>	5699
<b>Contract name:</b>	Residential Development
<b>Location:</b>	Dunshaughlin, Co. Meath
<b>Test No:</b>	SA04
<b>Date:</b>	14/02/2020

<b>Ground Conditions</b>		
From	To	
0.00	0.30	TOPSOIL.
0.40	0.60	Dark brown PEAT.
0.60	2.00	Firm grey slightly sandy gravelly silty CLAY with high cobble content.

**Remarks:**  
-

Elapsed Time (mins)	Fall of Water (m)
0	1.00
0.5	1.00
1	1.00
1.5	1.00
2	1.00
2.5	1.00
3	1.00
3.5	1.00
4	1.00
4.5	1.00
5	1.00
6	1.00
7	1.00
8	1.01
9	1.01
10	1.01
12	1.01
14	1.01
16	1.01
18	1.01
20	1.01
25	1.01
30	1.01
40	1.01
50	1.01
60	1.01
75	1.01
90	1.01
120	1.01

<b>Pit Dimensions (m)</b>	
Length (m)	1.60 m
Width (m)	0.60 m
Depth	2.00 m
<b>Water</b>	
Start Depth of Water	1.00 m
Depth of Water	1.00 m
75% Full	1.25 m
25% Full	1.75 m
75%-25%	0.50 m
Volume of water (75%-25%)	<b>0.48</b> m <sup>3</sup>
Area of Drainage	<b>8.80</b> m <sup>2</sup>
Area of Drainage (75%-25%)	<b>3.16</b> m <sup>2</sup>
<b>Time</b>	
75% Full	N/A min
25% Full	N/A min
Time 75% to 25%	<b>N/A</b> min
Time 75% to 25% (sec)	<b>N/A</b> sec



**f = Fail or Fail**  
**m/min**
**m/s**

**ST01 Sidewall**



**ST01 Spoil**



**ST02 Sidewall**



**ST02 Spoil**



**ST03 Sidewall**



**ST03 Spoil**



**ST04 Sidewall**



**ST04 Spoil**



**Appendix 4**  
**Geotechnical Laboratory Test Results**

### Classification Tests in accordance with BS1377: Part 4

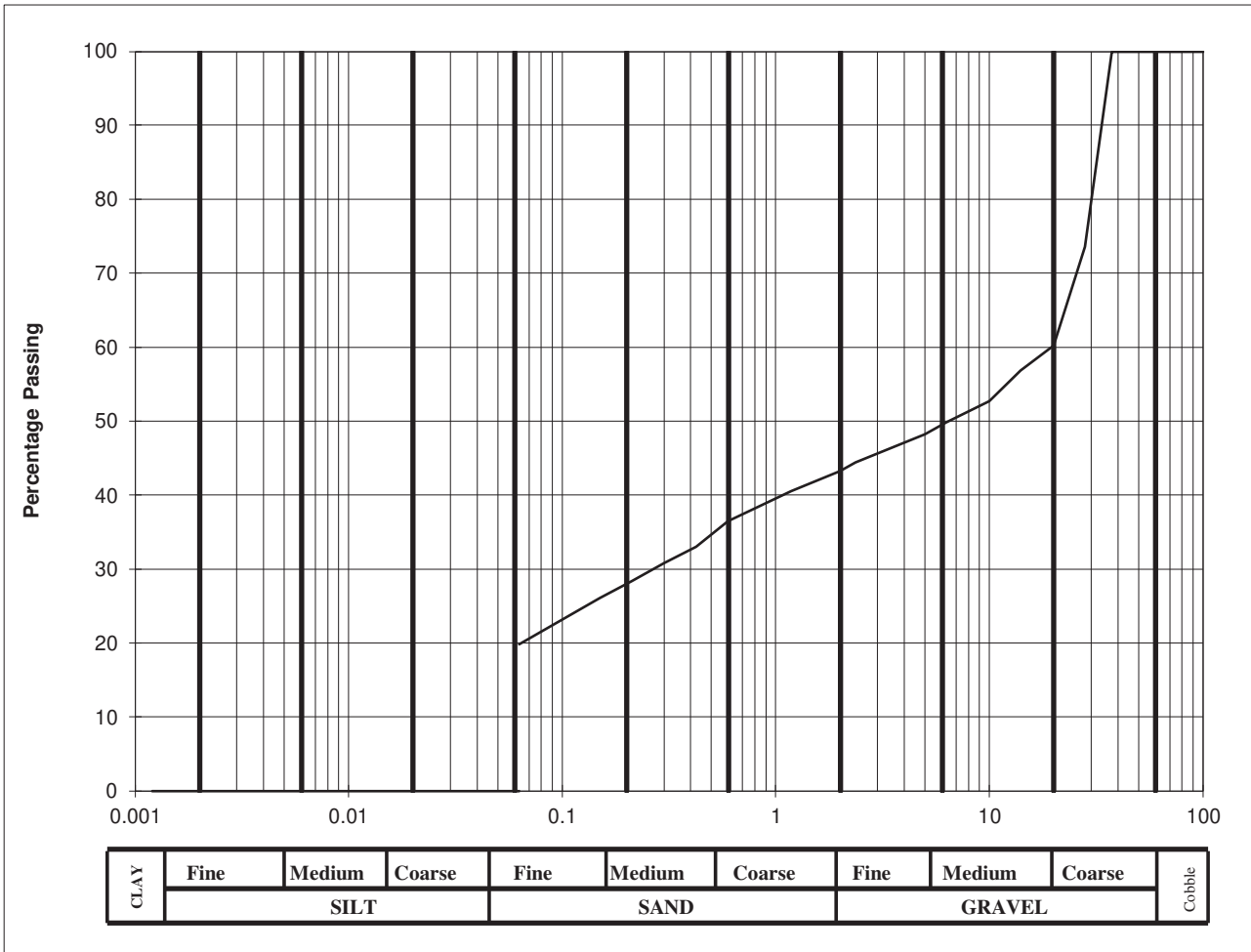
Client	Castlethorn Construction Ltd.
Site	Residential Development, Dunshaughlin
S.I. File No	5699 / 20
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	27th February 2020

Hole ID	Depth	Sample No	Lab Ref No.	Sample Type	Natural Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index %	Min. Dry Density Mg/m <sup>3</sup>	Particle Density Mg/m <sup>3</sup>	% passing 425um	Comments	Remarks C=Clay; M=Silt Plasticity: L=Low; I=Intermediate; H=High; V=Very High; E=Extremely High
TP03	1.00	1	20/384	B	14.4	34	20	14			33.0		CL
TP04	2.00	2	20/385	B	10.8	30	21	9			51.5		CL



BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	73.6		
20	60.2		
14	56.8		
10	52.7		
6.3	49.8		
5.0	48.2		
2.36	44.4		
2.00	43.2		
1.18	40.5		
0.600	36.5		
0.425	33		
0.300	30.8		
0.212	28.4		
0.150	26.1		
0.063	20		

Cobbles, %	0
Gravel, %	57
Sand, %	23
Clay / Silt, %	20



Client :	Castlethorn Construction
Project :	Residential Development, Dunshaughlin

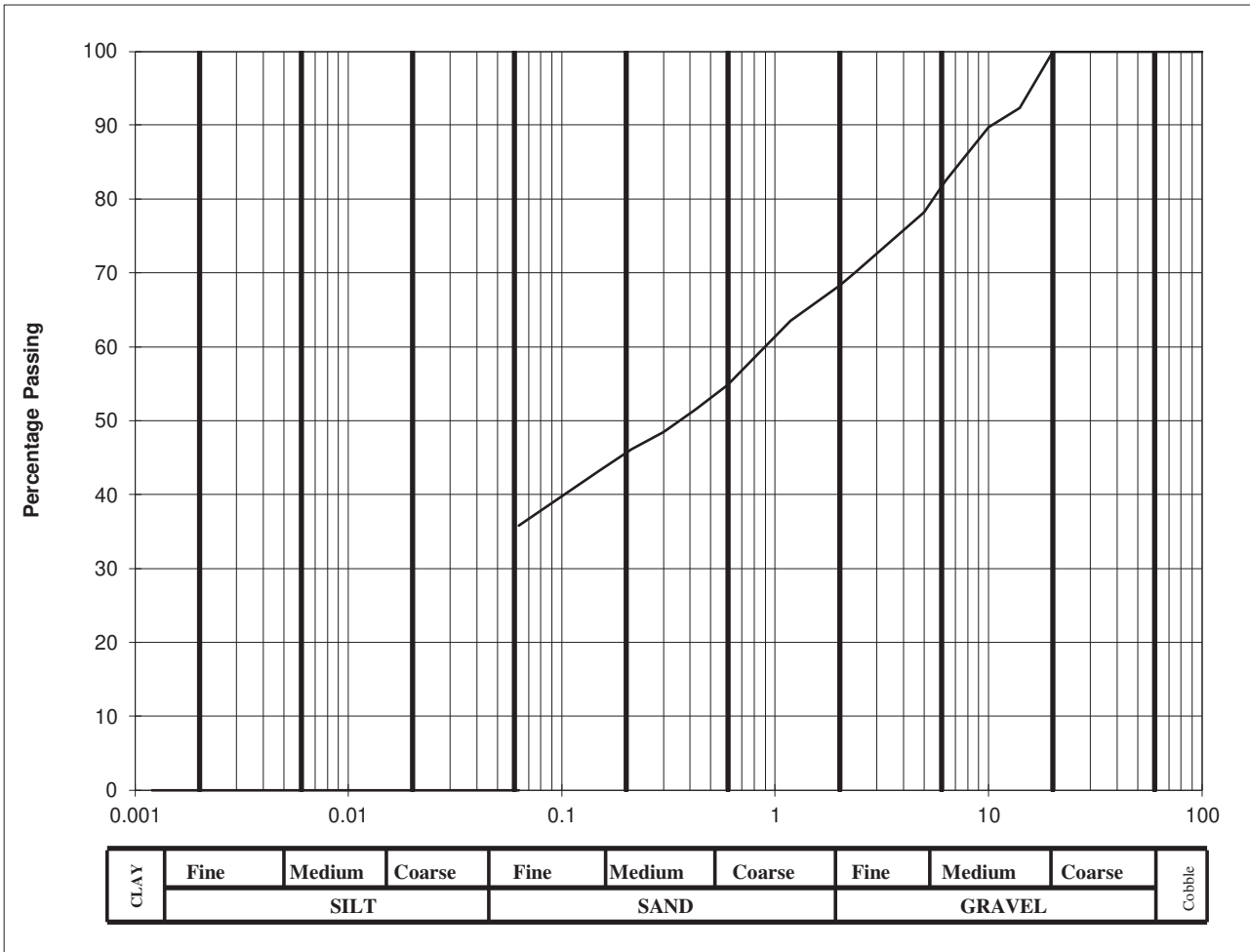
Lab. No :	20/2384
Sample No :	1

Hole ID :	TP 03
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	0.0630	
90	100	0.0200	
75	100	0.0060	
63	100	0.0020	
50	100		
37.5	100		
28	100		
20	100		
14	92.3		
10	89.7		
6.3	82.4		
5.0	78.2		
2.36	70		
2.00	68.2		
1.18	63.5		
0.600	54.8		
0.425	51.5		
0.300	48.5		
0.212	46.1		
0.150	43.2		
0.063	36		

Cobbles, %	0
Gravel, %	32
Sand, %	32
Clay / Silt, %	36



Client :	Castlethorn Construction
Project :	Residential Development, Dunshaughlin

Lab. No :	20/2385
Sample No :	2

Hole ID :	TP 04
Depth, m :	1.00

Material description :	slightly sandy slightly gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

**California Bearing Ratio (CBR) In accordance with BS1377: Part 4: Method 7**

Client	Castlethorn Construction Ltd.
Site	Residential Development, Dunshaughlin
S.I. File No	5699 / 20
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	27th February 2020

CBR No	Depth (mBGL)	Sample No	Sample Type	Lab Ref	Moisture Content (%)	CBR Value (%)	Location / Remarks
CBR01	0.50	MK10	CBR	20/387	33.5	5.2	
CBR02	0.50	MK11	CBR	20/388	43.4	4.2	
CBR03	0.50	MK12	CBR	20/389	41.6	4.3	
CBR04	0.50	MK13	CBR	20/390	38.6	4.8	
CBR05	0.50	MK14	CBR	20/391	30.0	4.6	
CBR06	0.50	MK15	CBR	20/392	35.3	4.8	
CBR07	0.50	MK16	CBR	20/393	33.3	4.6	
CBR08	0.50	MK17	CBR	20/394	23.0	4.1	
CBR09	0.50	MK18	CBR	20/395	19.0	4.6	
CBR10	0.50	MK19	CBR	20/396	20.1	4.7	
CBR11	0.50	MK20	CBR	20/397	14.6	5.0	
CBR12	0.50	MK21	CBR	20/398	15.1	4.6	
CBR13	0.50	MK22	CBR	20/399	15.5	4.5	
CBR14	0.50	MK23	CBR	20/400	14.6	7.3	
CBR15	0.50	MK24	CBR	20/401	38.8	4.5	
CBR16	0.50	MK25	CBR	20/402	22.0	5.0	

**Chemical Testing**  
**In accordance with BS 1377: Part 3**

Client	Castlethorn Construction Ltd.
Site	Residential Development, Dunshaughlin
S.I. File No	5699 / 20
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	27th February 2020

Hole Id	Depth (mBGL)	Sample No	Lab Ref	pH Value	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO <sub>3</sub> ) g/L	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO <sub>3</sub> ) %	Loss on Ignition (Organic Content) %	Chloride ion Content (water:soil ratio 2:1) %	% passing 2mm	Remarks
TP03	1.00	1	20/384	7.62	0.126	0.054		0.24	43.2	
TP04	2.00	2	20/385	7.81	0.125	0.086		0.28	68.2	
TP06	1.00	1	20/386	7.43	0.128	0.074		0.31	57.5	

**Appendix 5**  
**Environmental Laboratory Test Results**



Unit 7-8 Hawarden Business Park  
Manor Road (off Manor Lane)  
Hawarden  
Deeside  
CH5 3US

Tel: (01244) 528700  
Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com  
Website: www.alsenvironmental.co.uk

Site Investigations Ltd  
The Grange  
Carhugar  
12th Lock Road  
Lucan  
Co. Dublin

**Attention:** Site Investigations

## CERTIFICATE OF ANALYSIS

<b>Date of report Generation:</b>	06 March 2020
<b>Customer:</b>	Site Investigations Ltd
<b>Sample Delivery Group (SDG):</b>	200226-101
<b>Your Reference:</b>	5699
<b>Location:</b>	Dunshaughlin
<b>Report No:</b>	544564

We received 7 samples on Wednesday February 26, 2020 and 7 of these samples were scheduled for analysis which was completed on Friday March 06, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

**Sonia McWhan**

Operations Manager





# CERTIFICATE OF ANALYSIS

Validated

SDG: 200226-101  
Location: Dunshaughlin

Client Reference: 5699  
Order Number: 29/A/20

Report Number: 544564  
Superseded Report:

## Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21766745	TP1		0.50 - 0.50	24/02/2020
21766746	TP2		0.50 - 0.50	24/02/2020
21766750	TP03		1.00 - 1.00	24/02/2020
21766751	TP04		1.00 - 1.00	24/02/2020
21766747	TP4		0.50 - 0.50	24/02/2020
21766753	TP06		0.70 - 0.70	24/02/2020
21766748	TP7		0.50 - 0.50	24/02/2020

### Maximum Sample/Coolbox Temperature (°C) :

#### ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

### 7.7

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

**Only received samples which have had analysis scheduled will be shown on the following pages.**



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 200226-101	<b>Client Reference:</b> 5699	<b>Report Number:</b> 544564
<b>Location:</b> Dunshaughlin	<b>Order Number:</b> 29/A/20	<b>Superseded Report:</b>

**Results Legend**

- X Test
- N No Determination Possible

**Sample Types -**

- S - Soil/Solid
- UNS - Unspecified Solid
- GW - Ground Water
- SW - Surface Water
- LE - Land Leachate
- PL - Prepared Leachate
- PR - Process Water
- SA - Saline Water
- TE - Trade Effluent
- TS - Treated Sewage
- US - Untreated Sewage
- RE - Recreational Water
- DW - Drinking Water Non-regulatory
- UNL - Unspecified Liquid
- SL - Sludge
- G - Gas
- OTH - Other

	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type												
							21766745	21766746	21766750	21766751	21766747	21766753	21766748	TP1	TP2	TP03	TP04	TP4
Anions by Kone (w)	All	NDPs: 0 Tests: 4	X	X	X	X												
CEN Readings	All	NDPs: 0 Tests: 4	X	X	X	X												
Chromium III	All	NDPs: 0 Tests: 4		X	X	X												
Coronene	All	NDPs: 0 Tests: 4		X	X	X												
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4	X	X	X	X												
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 4	X	X	X	X												
EPH CWG GC (S)	All	NDPs: 0 Tests: 4		X	X	X												
Fluoride	All	NDPs: 0 Tests: 4	X	X	X	X												
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4		X	X	X												
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4		X	X	X												
Loss on Ignition in soils	All	NDPs: 0 Tests: 7		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Mercury Dissolved	All	NDPs: 0 Tests: 4	X	X	X	X												
Metals in solid samples by OES	All	NDPs: 0 Tests: 4		X	X	X												
Mineral Oil	All	NDPs: 0 Tests: 4		X	X	X												
PAH by GCMS	All	NDPs: 0 Tests: 4		X	X	X												





# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 200226-101	<b>Client Reference:</b> 5699	<b>Report Number:</b> 544564
<b>Location:</b> Dunshaughlin	<b>Order Number:</b> 29/A/20	<b>Superseded Report:</b>

Results Legend	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
	<b>X</b> Test <b>N</b> No Determination Possible  Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	21766745	TP1		0.50 - 0.50	60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE280)
	21766746	TP2		0.50 - 0.50	60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE280)	S
	21766750	TP03		1.00 - 1.00	250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE280)	S
	21766751	TP04		1.00 - 1.00	250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE280)	S
	21766747	TP4		0.50 - 0.50	60g VOC (ALE215) 250g Amber Jar (ALE210)	S
	21766753	TP06		0.70 - 0.70	250g Amber Jar (ALE210) 1kg TUB with Handle (ALE280)	S
	21766748	TP7		0.50 - 0.50	60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE280)	S

Parameter	All	NDPs: 0	Tests: 4	Tests: 4	Tests: 4	Tests: 4	Tests: 4	Tests: 4	Tests: 4
PCBs by GCMS	All	NDPs: 0	Tests: 4	X	X	X	X		
Phenols by HPLC (W)	All	NDPs: 0	Tests: 4	X	X	X	X		
Sample description	All	NDPs: 0	Tests: 7	X	X	X	X	X	X
Total Dissolved Solids on Leachates	All	NDPs: 0	Tests: 4	X	X	X	X		
Total Organic Carbon	All	NDPs: 0	Tests: 4	X	X	X	X		
TPH CWG GC (S)	All	NDPs: 0	Tests: 4	X	X	X	X		
VOC MS (S)	All	NDPs: 0	Tests: 4	X	X	X	X		



# CERTIFICATE OF ANALYSIS

Validated

SDG: 200226-101  
Location: Dunshaughlin

Client Reference: 5699  
Order Number: 29/A/20

Report Number: 544564  
Superseded Report:

## Sample Descriptions

### Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
-----------	----------	------	-----------------	--------	-------------	--------	------------	-------------	-------

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
21766745	TP1	0.50 - 0.50	Dark Brown	Silt Loam	Stones	Vegetation
21766746	TP2	0.50 - 0.50	Dark Brown	Silt Loam	Stones	Vegetation
21766750	TP03	1.00 - 1.00	Dark Brown	Silty Clay Loam	Stones	Vegetation
21766747	TP4	0.50 - 0.50	Dark Brown	Clay Loam	Stones	Vegetation
21766751	TP04	1.00 - 1.00	Dark Brown	Clay	Stones	None
21766753	TP06	0.70 - 0.70	Dark Brown	Silty Clay Loam	Stones	Vegetation
21766748	TP7	0.50 - 0.50	Dark Brown	Silt Loam	Stones	Vegetation

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 200226-101  
**Location:** Dunshaughlin

**Client Reference:** 5699  
**Order Number:** 29/A/20

**Report Number:** 544564  
**Superseded Report:**

Results Legend		Customer Sample Ref.	TP1	TP2	TP03	TP04	TP4	TP06
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.filt	Dissolved / filtered sample.							
tot.unfilt	Total / unfiltered sample.							
*	Subcontracted - refer to subcontractor report for accreditation status.							
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery							
(F)	Trigger breach confirmed							
1-3*§@	Sample deviation (see appendix)							
		Depth (m)	0.50 - 0.50	0.50 - 0.50	1.00 - 1.00	1.00 - 1.00	0.50 - 0.50	0.70 - 0.70
		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
		Date Sampled	24/02/2020	24/02/2020	24/02/2020	24/02/2020	24/02/2020	24/02/2020
		Sample Time						
		Date Received	26/02/2020	26/02/2020	26/02/2020	26/02/2020	26/02/2020	26/02/2020
		SDG Ref	200226-101	200226-101	200226-101	200226-101	200226-101	200226-101
		Lab Sample No.(s)	21766745	21766746	21766750	21766751	21766747	21766753
		AGS Reference						
Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	21	14	15	9.3	12	15
Loss on ignition	<0.7 %	TM018	5.65	2.6	2.67	1.67	2.83	2.69
			M	M	M	M	M	M
Mineral oil >C10-C40	<1 mg/kg	TM061	<1	<1			<1	
Organic Carbon, Total	<0.2 %	TM132	1.29	0.688			0.4	
			M	M			M	
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<0.6			<0.6	
			#	#			#	
PCB congener 28	<3 µg/kg	TM168	<3	<3			<3	
			M	M			M	
PCB congener 52	<3 µg/kg	TM168	<3	<3			<3	
			M	M			M	
PCB congener 101	<3 µg/kg	TM168	<3	<3			<3	
			M	M			M	
PCB congener 118	<3 µg/kg	TM168	<3	<3			<3	
			M	M			M	
PCB congener 138	<3 µg/kg	TM168	<3	<3			<3	
			M	M			M	
PCB congener 153	<3 µg/kg	TM168	<3	<3			<3	
			M	M			M	
PCB congener 180	<3 µg/kg	TM168	<3	<3			<3	
			M	M			M	
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21	<21			<21	
Chromium, Trivalent	<0.9 mg/kg	TM181	21.9	8.98			19.1	
Antimony	<0.6 mg/kg	TM181	3.46	2.01			10.3	
			#	#			#	
Arsenic	<0.6 mg/kg	TM181	20	12.2			8.21	
			M	M			M	
Barium	<0.6 mg/kg	TM181	65.5	39.3			112	
			#	#			#	
Cadmium	<0.02 mg/kg	TM181	2.66	1.85			3.57	
			M	M			M	
Chromium	<0.9 mg/kg	TM181	21.9	8.98			19.1	
			M	M			M	
Copper	<1.4 mg/kg	TM181	36.4	23			26.3	
			M	M			M	
Lead	<0.7 mg/kg	TM181	49.7	19.2			31.7	
			M	M			M	
Mercury	<0.14 mg/kg	TM181	<0.14	<0.14			<0.14	
			M	M			M	
Molybdenum	<0.1 mg/kg	TM181	5.74	4.23			2.05	
			#	#			#	
Nickel	<0.2 mg/kg	TM181	66.7	36.7			37.2	
			M	M			M	
Selenium	<1 mg/kg	TM181	1.65	<1			<1	
			#	#			#	
Zinc	<1.9 mg/kg	TM181	120	81.7			173	
			M	M			M	
Coronene	<200 µg/kg	TM410	<200	<200			<200	



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 200226-101  
**Location:** Dunshaughlin

**Client Reference:** 5699  
**Order Number:** 29/A/20

**Report Number:** 544564  
**Superseded Report:**

Results Legend		Customer Sample Ref.	TP7				
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
dis.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	Subcontracted - refer to subcontractor report for accreditation status.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery						
(F)	Trigger breach confirmed						
1-3*§@	Sample deviation (see appendix)						
		Depth (m)	0.50 - 0.50				
		Sample Type	Soil/Solid (S)				
		Date Sampled	24/02/2020				
		Sample Time	00:00:00				
		Date Received	26/02/2020				
		SDG Ref	200226-101				
		Lab Sample No.(s)	21766748				
		AGS Reference					
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	12				
Loss on ignition	<0.7 %	TM018	1.19				
				M			
Mineral oil >C10-C40	<1 mg/kg	TM061	<1				
Organic Carbon, Total	<0.2 %	TM132	0.497				
				M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6				
				#			
PCB congener 28	<3 µg/kg	TM168	<3				
				M			
PCB congener 52	<3 µg/kg	TM168	<3				
				M			
PCB congener 101	<3 µg/kg	TM168	<3				
				M			
PCB congener 118	<3 µg/kg	TM168	<3				
				M			
PCB congener 138	<3 µg/kg	TM168	<3				
				M			
PCB congener 153	<3 µg/kg	TM168	<3				
				M			
PCB congener 180	<3 µg/kg	TM168	<3				
				M			
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21				
Chromium, Trivalent	<0.9 mg/kg	TM181	13.8				
Antimony	<0.6 mg/kg	TM181	<0.6				
				#			
Arsenic	<0.6 mg/kg	TM181	2.23				
				M			
Barium	<0.6 mg/kg	TM181	25.8				
				#			
Cadmium	<0.02 mg/kg	TM181	1.14				
				M			
Chromium	<0.9 mg/kg	TM181	13.8				
				M			
Copper	<1.4 mg/kg	TM181	13.2				
				M			
Lead	<0.7 mg/kg	TM181	9.18				
				M			
Mercury	<0.14 mg/kg	TM181	<0.14				
				M			
Molybdenum	<0.1 mg/kg	TM181	0.465				
				#			
Nickel	<0.2 mg/kg	TM181	21.5				
				M			
Selenium	<1 mg/kg	TM181	14.9				
				#			
Zinc	<1.9 mg/kg	TM181	62.8				
				M			
Coronene	<200 µg/kg	TM410	<200				



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 200226-101  
**Location:** Dunshaughlin

**Client Reference:** 5699  
**Order Number:** 29/A/20

**Report Number:** 544564  
**Superseded Report:**

**PAH by GCMS**

Results Legend			Customer Sample Ref.	TP1	TP2	TP4	TP7		
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-3*§@	Sample deviation (see appendix)								
Component	LOD/Units	Method	AGS Reference						
Naphthalene	<9 µg/kg	TM218		<9	<9	<9	<9		
				M	M	M	M		
Acenaphthylene	<12 µg/kg	TM218		<12	<12	<12	<12		
				M	M	M	M		
Acenaphthene	<8 µg/kg	TM218		<8	<8	<8	<8		
				M	M	M	M		
Fluorene	<10 µg/kg	TM218		<10	<10	<10	<10		
				M	M	M	M		
Phenanthrene	<15 µg/kg	TM218		<15	<15	<15	<15		
				M	M	M	M		
Anthracene	<16 µg/kg	TM218		<16	<16	<16	<16		
				M	M	M	M		
Fluoranthene	<17 µg/kg	TM218		<17	<17	<17	<17		
				M	M	M	M		
Pyrene	<15 µg/kg	TM218		<15	<15	<15	<15		
				M	M	M	M		
Benz(a)anthracene	<14 µg/kg	TM218		<14	<14	<14	<14		
				M	M	M	M		
Chrysene	<10 µg/kg	TM218		<10	<10	<10	<10		
				M	M	M	M		
Benzo(b)fluoranthene	<15 µg/kg	TM218		<15	<15	<15	<15		
				M	M	M	M		
Benzo(k)fluoranthene	<14 µg/kg	TM218		<14	<14	<14	<14		
				M	M	M	M		
Benzo(a)pyrene	<15 µg/kg	TM218		<15	<15	<15	<15		
				M	M	M	M		
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		<18	<18	<18	<18		
				M	M	M	M		
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23	<23	<23	<23		
				M	M	M	M		
Benzo(g,h,i)perylene	<24 µg/kg	TM218		<24	<24	<24	<24		
				M	M	M	M		
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		<118	<118	<118	<118		



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 200226-101  
**Location:** Dunshaughlin

**Client Reference:** 5699  
**Order Number:** 29/A/20

**Report Number:** 544564  
**Superseded Report:**

**TPH CWG (S)**

Results Legend			Customer Sample Ref.	TP1	TP2	TP4	TP7		
#	ISO17025 accredited.								
M	mCERTS accredited.								
sq	Aqueous / settled sample.								
dis.filt	Dissolved / filtered sample.								
tot.unfilt	Total / unfiltered sample.								
*	Subcontracted - refer to subcontractor report for accreditation status.								
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery								
(F)	Trigger breach confirmed								
1-3*§@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m)	TP1	TP2	TP4	TP7		
GRO Surrogate % recovery**	%	TM089	0.50 - 0.50	79	85	91	81		
Aliphatics >C5-C6	<10 µg/kg	TM089	Soil/Solid (S)	<10	<10	<10	<10		
Aliphatics >C6-C8	<10 µg/kg	TM089	Soil/Solid (S)	<10	<10	<10	<10		
Aliphatics >C8-C10	<10 µg/kg	TM089	Soil/Solid (S)	<10	<10	<10	<10		
Aliphatics >C10-C12	<1000 µg/kg	TM414	Soil/Solid (S)	<1000	<1000	<1000	<1000		
Aliphatics >C12-C16	<1000 µg/kg	TM414	Soil/Solid (S)	<1000	<1000	<1000	<1000		
Aliphatics >C16-C21	<1000 µg/kg	TM414	Soil/Solid (S)	<1000	<1000	<1000	<1000		
Aliphatics >C21-C35	<1000 µg/kg	TM414	Soil/Solid (S)	3600	1710	1270	<1000		
Aliphatics >C35-C44	<1000 µg/kg	TM414	Soil/Solid (S)	<1000	<1000	<1000	<1000		
Total Aliphatics >C10-C44	<5000 µg/kg	TM414	Soil/Solid (S)	<5000	<5000	<5000	<5000		
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414	Soil/Solid (S)	<10000	<10000	<10000	<10000		
Aromatics >EC5-EC7	<10 µg/kg	TM089	Soil/Solid (S)	<10	<10	<10	<10		
Aromatics >EC7-EC8	<10 µg/kg	TM089	Soil/Solid (S)	<10	<10	<10	<10		
Aromatics >EC8-EC10	<10 µg/kg	TM089	Soil/Solid (S)	<10	<10	<10	<10		
Aromatics > EC10-EC12	<1000 µg/kg	TM414	Soil/Solid (S)	<1000	<1000	<1000	<1000		
Aromatics > EC12-EC16	<1000 µg/kg	TM414	Soil/Solid (S)	<1000	<1000	<1000	<1000		
Aromatics > EC16-EC21	<1000 µg/kg	TM414	Soil/Solid (S)	<1000	<1000	<1000	<1000		
Aromatics > EC21-EC35	<1000 µg/kg	TM414	Soil/Solid (S)	2620	<1000	2990	<1000		
Aromatics >EC35-EC44	<1000 µg/kg	TM414	Soil/Solid (S)	<1000	<1000	<1000	<1000		
Aromatics > EC40-EC44	<1000 µg/kg	TM414	Soil/Solid (S)	<1000	<1000	<1000	<1000		
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414	Soil/Solid (S)	<5000	<5000	<5000	<5000		
Total Aliphatics & Aromatics >C5-C44	<10000 µg/kg	TM414	Soil/Solid (S)	<10000	<10000	<10000	<10000		
GRO >C5-C6	<20 µg/kg	TM089	Soil/Solid (S)	<20	<20	<20	<20		
GRO >C6-C7	<20 µg/kg	TM089	Soil/Solid (S)	<20	<20	<20	<20		
GRO >C7-C8	<20 µg/kg	TM089	Soil/Solid (S)	<20	<20	<20	<20		
GRO >C8-C10	<20 µg/kg	TM089	Soil/Solid (S)	<20	<20	<20	<20		
GRO >C10-C12	<20 µg/kg	TM089	Soil/Solid (S)	<20	<20	<20	<20		
Total Aliphatics >C5-C10	<50 µg/kg	TM089	Soil/Solid (S)	<50	<50	<50	<50		
Total Aromatics >EC5-EC10	<50 µg/kg	TM089	Soil/Solid (S)	<50	<50	<50	<50		
GRO >C5-C10	<20 µg/kg	TM089	Soil/Solid (S)	<20	<20	<20	<20		





# CERTIFICATE OF ANALYSIS

Validated

SDG: 200226-101  
Location: Dunshaughlin

Client Reference: 5699  
Order Number: 29/A/20

Report Number: 544564  
Superseded Report:

## CEN 10:1 SINGLE STAGE LEACHATE TEST

### WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

<b>Client Reference</b>	
<b>Mass Sample taken (kg)</b>	0.119
<b>Mass of dry sample (kg)</b>	0.090
<b>Particle Size &lt;4mm</b>	>95%

<b>Site Location</b>	Dunshaughlin
<b>Natural Moisture Content (%)</b>	31.5
<b>Dry Matter Content (%)</b>	76

<b>Case</b>	
<b>SDG</b>	200226-101
<b>Lab Sample Number(s)</b>	21766745
<b>Sampled Date</b>	24-Feb-2020
<b>Customer Sample Ref.</b>	TP1
<b>Depth (m)</b>	0.50 - 0.50

#### Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	1.29
Loss on Ignition (%)	5.65
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<1
PAH Sum of 17 (mg/kg)	-
pH (pH Units)	-
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 10:1 eluate (mg/l)		A <sub>2</sub> 10:1 conc <sup>n</sup> leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	0.000595	<0.0005	0.00595	<0.005	0.5	2	25
Barium	0.00425	<0.0002	0.0425	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00176	<0.0003	0.0176	<0.003	2	50	100
Mercury Dissolved (CVAf)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00275	<0.0004	0.0275	<0.004	0.4	10	40
Lead	0.000818	<0.0002	0.00818	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00764	<0.001	0.0764	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	49.1	<10	491	<100	4000	60000	100000
Total Monohydric Phenols (W)	0.02	<0.016	0.2	<0.16	1	-	-
Dissolved Organic Carbon	5.05	<3	50.5	<30	500	800	1000

### Leach Test Information

Date Prepared	28-Feb-2020
pH (pH Units)	7.63
Conductivity (µS/cm)	39.10
Temperature (°C)	19.20
Volume Leachant (Litres)	0.872

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable  
 Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation  
 Mcerts Certification does not apply to leachates  
 06/03/2020 15:07:44





# CERTIFICATE OF ANALYSIS

Validated

SDG: 200226-101	Client Reference: 5699	Report Number: 544564
Location: Dunshaughlin	Order Number: 29/A/20	Superseded Report:

## CEN 10:1 SINGLE STAGE LEACHATE TEST

### WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference	Site Location	Dunshaughlin
Mass Sample taken (kg)	Natural Moisture Content (%)	21.1
Mass of dry sample (kg)	Dry Matter Content (%)	82.5
Particle Size <4mm		>95%

<b>Case</b>	
SDG	200226-101
Lab Sample Number(s)	21766746
Sampled Date	24-Feb-2020
Customer Sample Ref.	TP2
Depth (m)	0.50 - 0.50

### Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.688
Loss on Ignition (%)	2.6
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<1
PAH Sum of 17 (mg/kg)	-
pH (pH Units)	-
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 10:1 eluate (mg/l)		A <sub>2</sub> 10:1 conc <sup>n</sup> leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.0049	<0.0002	0.049	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.002	<0.0003	0.02	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00397	<0.003	0.0397	<0.03	0.5	10	30
Nickel	0.00102	<0.0004	0.0102	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00228	<0.001	0.0228	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	94.1	<10	941	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.49	<3	34.9	<30	500	800	1000

### Leach Test Information

Date Prepared	28-Feb-2020
pH (pH Units)	8.57
Conductivity (µS/cm)	115.00
Temperature (°C)	19.10
Volume Leachant (Litres)	0.882

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable  
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 Mcerts Certification does not apply to leachates  
 06/03/2020 15:07:44



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 200226-101	<b>Client Reference:</b> 5699	<b>Report Number:</b> 544564
<b>Location:</b> Dunshaughlin	<b>Order Number:</b> 29/A/20	<b>Superseded Report:</b>

## CEN 10:1 SINGLE STAGE LEACHATE TEST

### WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

<b>Client Reference</b>	Dunshaughlin	<b>Site Location</b>	Dunshaughlin
<b>Mass Sample taken (kg)</b>	0.105	<b>Natural Moisture Content (%)</b>	18.2
<b>Mass of dry sample (kg)</b>	0.090	<b>Dry Matter Content (%)</b>	84.6
<b>Particle Size &lt;4mm</b>	>95%		

<b>Case</b>	
<b>SDG</b>	200226-101
<b>Lab Sample Number(s)</b>	21766747
<b>Sampled Date</b>	24-Feb-2020
<b>Customer Sample Ref.</b>	TP4
<b>Depth (m)</b>	0.50 - 0.50

#### Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.4
Loss on Ignition (%)	2.83
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<1
PAH Sum of 17 (mg/kg)	-
pH (pH Units)	-
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 10:1 eluate (mg/l)		A <sub>2</sub> 10:1 conc <sup>n</sup> leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection	Inert	Stable	Hazardous
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00893	<0.0002	0.0893	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00325	<0.0003	0.0325	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00442	<0.003	0.0442	<0.03	0.5	10	30
Nickel	0.000665	<0.0004	0.00665	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.701	<0.5	7.01	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	69.6	<10	696	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.46	<3	44.6	<30	500	800	1000

### Leach Test Information

Date Prepared	28-Feb-2020
pH (pH Units)	8.70
Conductivity (µS/cm)	90.60
Temperature (°C)	18.80
Volume Leachant (Litres)	0.884

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable  
 Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation  
 Mcerts Certification does not apply to leachates  
 06/03/2020 15:07:44



# CERTIFICATE OF ANALYSIS

Validated

<b>SDG:</b> 200226-101	<b>Client Reference:</b> 5699	<b>Report Number:</b> 544564
<b>Location:</b> Dunshaughlin	<b>Order Number:</b> 29/A/20	<b>Superseded Report:</b>

## CEN 10:1 SINGLE STAGE LEACHATE TEST

### WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

<b>Client Reference</b>	<b>Site Location</b> Dunshaughlin
<b>Mass Sample taken (kg)</b> 0.104	<b>Natural Moisture Content (%)</b> 16.9
<b>Mass of dry sample (kg)</b> 0.090	<b>Dry Matter Content (%)</b> 85.5
<b>Particle Size &lt;4mm</b> >95%	

<b>Case</b>	
<b>SDG</b>	200226-101
<b>Lab Sample Number(s)</b>	21766748
<b>Sampled Date</b>	24-Feb-2020
<b>Customer Sample Ref.</b>	TP7
<b>Depth (m)</b>	0.50 - 0.50

#### Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
3	5	6
-	-	10
-	-	-
1	-	-
500	-	-
-	-	-
-	-	-
-	-	-
-	-	-

Solid Waste Analysis	Result
Total Organic Carbon (%)	0.497
Loss on Ignition (%)	1.19
Sum of BTEX (mg/kg)	-
Sum of 7 PCBs (mg/kg)	<0.021
Mineral Oil (mg/kg)	<1
PAH Sum of 17 (mg/kg)	-
pH (pH Units)	-
ANC to pH 6 (mol/kg)	-
ANC to pH 4 (mol/kg)	-

Eluate Analysis	C <sub>2</sub> Conc <sup>n</sup> in 10:1 eluate (mg/l)		A <sub>2</sub> 10:1 conc <sup>n</sup> leached (mg/kg)		Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
	Result	Limit of Detection	Result	Limit of Detection	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Arsenic	0.00162	<0.0005	0.0162	<0.005	0.5	2	25
Barium	0.00325	<0.0002	0.0325	<0.002	20	100	300
Cadmium	0.0000828	<0.00008	0.000828	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00717	<0.0003	0.0717	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0105	<0.003	0.105	<0.03	0.5	10	30
Nickel	0.00343	<0.0004	0.0343	<0.004	0.4	10	40
Lead	0.000456	<0.0002	0.00456	<0.002	0.5	10	50
Antimony	0.0012	<0.001	0.012	<0.01	0.06	0.7	5
Selenium	0.00898	<0.001	0.0898	<0.01	0.1	0.5	7
Zinc	0.00287	<0.001	0.0287	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	54.7	<10	547	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	6.38	<3	63.8	<30	500	800	1000

### Leach Test Information

Date Prepared	28-Feb-2020
pH (pH Units)	9.06
Conductivity (µS/cm)	67.90
Temperature (°C)	19.30
Volume Leachant (Litres)	0.885

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable  
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 06/03/2020 15:07:44



## CERTIFICATE OF ANALYSIS

SDG: 200226-101  
Location: DunshaughlinClient Reference: 5699  
Order Number: 29/A/20Report Number: 544564  
Superseded Report:

## Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



# CERTIFICATE OF ANALYSIS

Validated

**SDG:** 200226-101  
**Location:** Dunshaughlin

**Client Reference:** 5699  
**Order Number:** 29/A/20

**Report Number:** 544564  
**Superseded Report:**

## Test Completion Dates

Lab Sample No(s)	21766745	21766746	21766750	21766747	21766751	21766753	21766748
Customer Sample Ref.	TP1	TP2	TP03	TP4	TP04	TP06	TP7
AGS Ref.							
Depth	0.50 - 0.50	0.50 - 0.50	1.00 - 1.00	0.50 - 0.50	1.00 - 1.00	0.70 - 0.70	0.50 - 0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (w)	05-Mar-2020	05-Mar-2020		05-Mar-2020			05-Mar-2020
CEN 10:1 Leachate (1 Stage)	28-Feb-2020	28-Feb-2020		28-Feb-2020			28-Feb-2020
CEN Readings	01-Mar-2020	01-Mar-2020		01-Mar-2020			01-Mar-2020
Chromium III	05-Mar-2020	05-Mar-2020		05-Mar-2020			05-Mar-2020
Coronene	04-Mar-2020	04-Mar-2020		04-Mar-2020			04-Mar-2020
Dissolved Metals by ICP-MS	06-Mar-2020	05-Mar-2020		05-Mar-2020			05-Mar-2020
Dissolved Organic/Inorganic Carbon	06-Mar-2020	05-Mar-2020		06-Mar-2020			06-Mar-2020
EPH CWG GC (S)	04-Mar-2020	05-Mar-2020		05-Mar-2020			05-Mar-2020
Fluoride	02-Mar-2020	02-Mar-2020		02-Mar-2020			02-Mar-2020
GRO by GC-FID (S)	04-Mar-2020	04-Mar-2020		04-Mar-2020			04-Mar-2020
Hexavalent Chromium (s)	04-Mar-2020	04-Mar-2020		04-Mar-2020			04-Mar-2020
Loss on Ignition in soils	04-Mar-2020	04-Mar-2020	04-Mar-2020	04-Mar-2020	04-Mar-2020	04-Mar-2020	04-Mar-2020
Mercury Dissolved	02-Mar-2020	03-Mar-2020		02-Mar-2020			02-Mar-2020
Metals in solid samples by OES	05-Mar-2020	05-Mar-2020		05-Mar-2020			05-Mar-2020
Mineral Oil	04-Mar-2020	04-Mar-2020		04-Mar-2020			04-Mar-2020
Moisture at 105C	28-Feb-2020	28-Feb-2020		28-Feb-2020			28-Feb-2020
PAH by GCMS	04-Mar-2020	04-Mar-2020		04-Mar-2020			04-Mar-2020
PCBs by GCMS	04-Mar-2020	04-Mar-2020		04-Mar-2020			04-Mar-2020
Phenols by HPLC (W)	03-Mar-2020	03-Mar-2020		03-Mar-2020			03-Mar-2020
Sample description	27-Feb-2020	27-Feb-2020	27-Feb-2020	27-Feb-2020	27-Feb-2020	27-Feb-2020	27-Feb-2020
Total Dissolved Solids on Leachates	05-Mar-2020	04-Mar-2020		05-Mar-2020			04-Mar-2020
Total Organic Carbon	04-Mar-2020	04-Mar-2020		04-Mar-2020			04-Mar-2020
TPH CWG GC (S)	04-Mar-2020	05-Mar-2020		05-Mar-2020			05-Mar-2020
VOC MS (S)	05-Mar-2020	05-Mar-2020		05-Mar-2020			05-Mar-2020



# CERTIFICATE OF ANALYSIS

<b>SDG:</b> 200226-101	<b>Client Reference:</b> 5699	<b>Report Number:</b> 544564
<b>Location:</b> Dunshaughlin	<b>Order Number:</b> 29/A/20	<b>Superseded Report:</b>

## Appendix

## General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

### 18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

### 19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

#### Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107)*.

**Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.**

**The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.**



# Waste Classification Report



K6XGX-EUUN2-QL7UK

## Job name

5699

## Description/Comments

Client: Castlethorn Construction  
Engineer: Waterman Moylan

## Project

Residential Development

## Site

Dunshaughlin, Co. Meath

## Related Documents

#	Name	Description
1	200226-101.hwol	.hwol file used to create the Job

## Waste Stream Template

Rilta Suite NEW

## Classified by

Name:	Company:	HazWasteOnline™ Training Record:	
<b>Stephen Letch</b>	<b>Site Investigations Ltd</b>	<b>Course</b>	<b>Date</b>
Date:	<b>Carhugar, The Grange</b>	Hazardous Waste Classification	09 Apr 2019
<b>10 Mar 2020 10:22 GMT</b>	<b>12th Lock Road, Lucan</b>	Advanced Hazardous Waste Classification	09 Oct 2019
Telephone:	<b>Dublin</b>		
<b>353 1 6108 768</b>			

## Report

Created by: Stephen Letch  
Created date: 10 Mar 2020 10:22 GMT

## Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP1-240220-0.50-0.50	0.50	Non Hazardous		2
2	TP2-240220-0.50-0.50	0.50	Non Hazardous		5
3	TP4-240220-0.50-0.50	0.50	Non Hazardous		8
4	TP7-240220-0.50-0.50	0.50	Non Hazardous		11

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	14
Appendix B: Rationale for selection of metal species	16
Appendix C: Version	16



Classification of sample: TP1-240220-0.50-0.50

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

Sample details

Sample Name:	LoW Code:	
<b>TP1-240220-0.50-0.50</b>	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>0.50 m</b>		
Moisture content:		
<b>21%</b>		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>					
3	antimony { antimony trioxide }				3.46 mg/kg	1.197	3.272 mg/kg	0.000327 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				20 mg/kg	1.534	24.235 mg/kg	0.00242 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				65.5 mg/kg	1.233	63.827 mg/kg	0.00638 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				2.66 mg/kg	1.855	3.897 mg/kg	0.00039 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				36.4 mg/kg	1.126	32.376 mg/kg	0.00324 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	49.7 mg/kg		39.263 mg/kg	0.00393 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.14 mg/kg	1.353	<0.189 mg/kg	<0.0000189 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				5.74 mg/kg	1.5	6.803 mg/kg	0.00068 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				66.7 mg/kg	2.637	138.935 mg/kg	0.0139 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				1.65 mg/kg	2.554	3.329 mg/kg	0.000333 %	✓	
	034-002-00-8									
13	zinc { zinc sulphate }				120 mg/kg	2.469	234.089 mg/kg	0.0234 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							



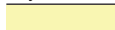





#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
14	chromium in chromium(III) compounds { chromium(III) oxide }				21.9	mg/kg	1.462	25.286	mg/kg	0.00253 %	✓	
		215-160-9	1308-38-9									
15	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
16	naphthalene				<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
17	acenaphthylene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
		205-917-1	208-96-8									
18	acenaphthene				<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
		201-469-6	83-32-9									
19	fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		201-695-5	86-73-7									
20	phenanthrene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
		201-581-5	85-01-8									
21	anthracene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
		204-371-1	120-12-7									
22	fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
		205-912-4	206-44-0									
23	pyrene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
		204-927-3	129-00-0									
24	benzo[a]anthracene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
	601-033-00-9	200-280-6	56-55-3									
25	chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-048-00-0	205-923-4	218-01-9									
26	benzo[b]fluoranthene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
	601-034-00-4	205-911-9	205-99-2									
27	benzo[k]fluoranthene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
	601-036-00-5	205-916-6	207-08-9									
28	benzo[a]pyrene; benzo[def]chrysene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
	601-032-00-3	200-028-5	50-32-8									
29	indeno[123-cd]pyrene				<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
		205-893-2	193-39-5									
30	dibenz[a,h]anthracene				<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
	601-041-00-2	200-181-8	53-70-3									
31	benzo[ghi]perylene				<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
		205-883-8	191-24-2									
32	polychlorobiphenyls; PCB				<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
	602-039-00-4	215-648-1	1336-36-3									
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
34	benzene				<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
35	toluene				<0.007	mg/kg		<0.007	mg/kg	<0.0000007 %		<LOD
	601-021-00-3	203-625-9	108-88-3									
36	ethylbenzene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
	601-023-00-4	202-849-4	100-41-4									
37	coronene				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
		205-881-7	191-07-1									
38	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
Total:										0.0587 %		



Key

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	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<b>&lt;LOD</b>	Below limit of detection
<b>ND</b>	Not detected
CLP: Note 1	Only the metal concentration has been used for classification



**Classification of sample: TP2-240220-0.50-0.50**

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

**Sample details**

Sample Name:	LoW Code:	
<b>TP2-240220-0.50-0.50</b>	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>0.50 m</b>		
Moisture content:		
<b>14%</b>		
(wet weight correction)		

**Hazard properties**

None identified

**Determinands**

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

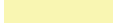
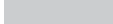


#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>					
3	antimony { antimony trioxide }				2.01 mg/kg	1.197	2.069 mg/kg	0.000207 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				12.2 mg/kg	1.534	16.093 mg/kg	0.00161 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				39.3 mg/kg	1.233	41.69 mg/kg	0.00417 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				1.85 mg/kg	1.855	2.951 mg/kg	0.000295 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				23 mg/kg	1.126	22.27 mg/kg	0.00223 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	19.2 mg/kg		16.512 mg/kg	0.00165 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.14 mg/kg	1.353	<0.189 mg/kg	<0.0000189 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				4.23 mg/kg	1.5	5.457 mg/kg	0.000546 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				36.7 mg/kg	2.637	83.219 mg/kg	0.00832 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	034-002-00-8									
13	zinc { zinc sulphate }				81.7 mg/kg	2.469	173.498 mg/kg	0.0173 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							





Key

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	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<b>&lt;LOD</b>	Below limit of detection
<b>ND</b>	Not detected
CLP: Note 1	Only the metal concentration has been used for classification



**Classification of sample: TP4-240220-0.50-0.50**

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

**Sample details**

Sample Name:	LoW Code:	
<b>TP4-240220-0.50-0.50</b>	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>0.50 m</b>		
Moisture content:		
<b>12%</b>		
(wet weight correction)		

**Hazard properties**

None identified

**Determinands**

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>					
3	antimony { antimony trioxide }				10.3 mg/kg	1.197	10.851 mg/kg	0.00109 %	✓	
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				8.21 mg/kg	1.534	11.082 mg/kg	0.00111 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				112 mg/kg	1.233	121.573 mg/kg	0.0122 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				3.57 mg/kg	1.855	5.826 mg/kg	0.000583 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				26.3 mg/kg	1.126	26.058 mg/kg	0.00261 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	31.7 mg/kg		27.896 mg/kg	0.00279 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.14 mg/kg	1.353	<0.189 mg/kg	<0.0000189 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				2.05 mg/kg	1.5	2.706 mg/kg	0.000271 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				37.2 mg/kg	2.637	86.315 mg/kg	0.00863 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
	034-002-00-8									
13	zinc { zinc sulphate }				173 mg/kg	2.469	375.926 mg/kg	0.0376 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							

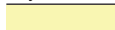





#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
14	chromium in chromium(III) compounds { chromium(III) oxide }				19.1	mg/kg	1.462	24.566	mg/kg	0.00246 %	✓	
		215-160-9	1308-38-9									
15	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
16	naphthalene				<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
	601-052-00-2	202-049-5	91-20-3									
17	acenaphthylene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
		205-917-1	208-96-8									
18	acenaphthene				<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
		201-469-6	83-32-9									
19	fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		201-695-5	86-73-7									
20	phenanthrene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
		201-581-5	85-01-8									
21	anthracene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
		204-371-1	120-12-7									
22	fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
		205-912-4	206-44-0									
23	pyrene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
		204-927-3	129-00-0									
24	benzo[a]anthracene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
	601-033-00-9	200-280-6	56-55-3									
25	chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	601-048-00-0	205-923-4	218-01-9									
26	benzo[b]fluoranthene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
	601-034-00-4	205-911-9	205-99-2									
27	benzo[k]fluoranthene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
	601-036-00-5	205-916-6	207-08-9									
28	benzo[a]pyrene; benzo[def]chrysene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
	601-032-00-3	200-028-5	50-32-8									
29	indeno[123-cd]pyrene				<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
		205-893-2	193-39-5									
30	dibenz[a,h]anthracene				<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
	601-041-00-2	200-181-8	53-70-3									
31	benzo[ghi]perylene				<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
		205-883-8	191-24-2									
32	polychlorobiphenyls; PCB				<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
	602-039-00-4	215-648-1	1336-36-3									
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									
34	benzene				<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
	601-020-00-8	200-753-7	71-43-2									
35	toluene				<0.007	mg/kg		<0.007	mg/kg	<0.0000007 %		<LOD
	601-021-00-3	203-625-9	108-88-3									
36	ethylbenzene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
	601-023-00-4	202-849-4	100-41-4									
37	coronene				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
		205-881-7	191-07-1									
38	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
Total:										0.0707 %		



Key

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	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<b>&lt;LOD</b>	Below limit of detection
<b>ND</b>	Not detected
CLP: Note 1	Only the metal concentration has been used for classification





**Classification of sample: TP7-240220-0.50-0.50**

✔ **Non Hazardous Waste**  
Classified as **17 05 04**  
in the List of Waste

**Sample details**

Sample Name:	LoW Code:
<b>TP7-240220-0.50-0.50</b>	Chapter:
Sample Depth:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
<b>0.50 m</b>	Entry:
Moisture content:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
<b>12%</b>	
(wet weight correction)	

**Hazard properties**

None identified

**Determinands**

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
2	confirm TPH has NOT arisen from diesel or petrol				<input checked="" type="checkbox"/>					
3	antimony { antimony trioxide }				<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
	051-005-00-X	215-175-0	1309-64-4							
4	arsenic { arsenic pentoxide }				2.23 mg/kg	1.534	3.01 mg/kg	0.000301 %	✓	
	033-004-00-6	215-116-9	1303-28-2							
5	barium { barium sulphide }				25.8 mg/kg	1.233	28.005 mg/kg	0.0028 %	✓	
	016-002-00-X	244-214-4	21109-95-5							
6	cadmium { cadmium sulfate }				1.14 mg/kg	1.855	1.861 mg/kg	0.000186 %	✓	
	048-009-00-9	233-331-6	10124-36-4							
7	copper { dicopper oxide; copper (I) oxide }				13.2 mg/kg	1.126	13.078 mg/kg	0.00131 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	9.18 mg/kg		8.078 mg/kg	0.000808 %	✓	
	082-001-00-6									
9	mercury { mercury dichloride }				<0.14 mg/kg	1.353	<0.189 mg/kg	<0.0000189 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
10	molybdenum { molybdenum(VI) oxide }				0.465 mg/kg	1.5	0.614 mg/kg	0.0000614 %	✓	
	042-001-00-9	215-204-7	1313-27-5							
11	nickel { nickel sulfate }				21.5 mg/kg	2.637	49.886 mg/kg	0.00499 %	✓	
	028-009-00-5	232-104-9	7786-81-4							
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				14.9 mg/kg	2.554	33.483 mg/kg	0.00335 %	✓	
	034-002-00-8									
13	zinc { zinc sulphate }				62.8 mg/kg	2.469	136.463 mg/kg	0.0136 %	✓	
	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]							



#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
14	chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		13.8	mg/kg	1.462	17.749	mg/kg	0.00177 %	✓	
15	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0	<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16	naphthalene	601-052-00-2	202-049-5	91-20-3	<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
17	acenaphthylene		205-917-1	208-96-8	<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
18	acenaphthene		201-469-6	83-32-9	<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
19	fluorene		201-695-5	86-73-7	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
20	phenanthrene		201-581-5	85-01-8	<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
21	anthracene		204-371-1	120-12-7	<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
22	fluoranthene		205-912-4	206-44-0	<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
23	pyrene		204-927-3	129-00-0	<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
24	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25	chrysene	601-048-00-0	205-923-4	218-01-9	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
29	indeno[123-cd]pyrene		205-893-2	193-39-5	<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
30	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
31	benzo[ghi]perylene		205-883-8	191-24-2	<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
32	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3	<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
33	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4	<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34	benzene	601-020-00-8	200-753-7	71-43-2	<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
35	toluene	601-021-00-3	203-625-9	108-88-3	0.0111	mg/kg		0.0097	mg/kg	0.000000977 %	✓	
36	ethylbenzene	601-023-00-4	202-849-4	100-41-4	<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
37	coronene		205-881-7	191-07-1	<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38	o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]	<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
Total:										0.0305 %		



Key

---

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected

CLP: Note 1 Only the metal concentration has been used for classification

---

### Supplementary Hazardous Property Information

**HP 3(i): Flammable** "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because HP 3 can be discounted as this is a solid waste without a free draining liquid phase.

Hazard Statements hit:

---

**Flam. Liq. 2; H225** "Highly flammable liquid and vapour."

Because of determinand:

---

toluene: (conc.: 9.77e-07%)



## Appendix A: Classifier defined and non CLP determinands

### • TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

### • confirm TPH has NOT arisen from diesel or petrol

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

### • barium sulphide (EC Number: 244-214-4, CAS Number: 21109-95-5)

CLP index number: 016-002-00-X

Description/Comments:

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): EUH031 >= 0.8 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH031 >= 0.8 % hazard statement sourced from: WM3, Table C12.2

### • lead compounds with the exception of those specified elsewhere in this Annex (worst case)

CLP index number: 082-001-00-6

Description/Comments: Worst Case: IARC considers lead compounds Group 1; Carcinogenic to humans; Lead REACH Consortium considers some lead compounds Carcinogenic category 1A

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium [www.reach-lead.eu/substanceinformation.html](http://www.reach-lead.eu/substanceinformation.html) (worst case lead compounds). Review date 29/09/2015

### • chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

### • acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

### • acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

### • fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400



• **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

• **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

• **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

• **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

• **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

• **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

• **polychlorobiphenyls; PCB** (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4

Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)

Additional Hazard Statement(s): Carc. 1A H350

Reason for additional Hazards Statement(s):

29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

• **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

• **coronene** (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases;

SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.

Data source:

<http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en>

Data source date: 16 Jun 2014

Hazard Statements: STOT SE 2 H371



## Appendix B: Rationale for selection of metal species

### antimony {antimony trioxide}

Worst case scenario.

### arsenic {arsenic pentoxide}

Arsenic pentoxide used as most hazardous species.

### barium {barium sulphide}

Chromium VII at limits of detection. Barium sulphide used as the next most hazardous species. No chromate present.

### cadmium {cadmium sulfate}

Cadmium sulphate used as the most hazardous species.

### copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

### lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Chromium VII at limits of detection. Lead compounds used as the next most hazardous species. No chromate present.

### mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

### molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight.

### nickel {nickel sulfate}

Chromium VII at limits of detection. Nickel sulphate used as the next most hazardous species. No chromate present.

### selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil.

### zinc {zinc sulphate}

Chromium VII at limits of detection. Zinc sulphate used as the next most hazardous species. No chromate present.

### chromium in chromium(III) compounds {chromium(III) oxide}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass

### chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments.

## Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018

HazWasteOnline Classification Engine Version: 2020.52.4178.8324 (21 Feb 2020)

HazWasteOnline Database: 2020.52.4178.8324 (21 Feb 2020)



This classification utilises the following guidance and legislation:

**WM3 v1.1 - Waste Classification** - 1st Edition v1.1 - May 2018  
**CLP Regulation** - Regulation 1272/2008/EC of 16 December 2008  
**1st ATP** - Regulation 790/2009/EC of 10 August 2009  
**2nd ATP** - Regulation 286/2011/EC of 10 March 2011  
**3rd ATP** - Regulation 618/2012/EU of 10 July 2012  
**4th ATP** - Regulation 487/2013/EU of 8 May 2013  
**Correction to 1st ATP** - Regulation 758/2013/EU of 7 August 2013  
**5th ATP** - Regulation 944/2013/EU of 2 October 2013  
**6th ATP** - Regulation 605/2014/EU of 5 June 2014  
**WFD Annex III replacement** - Regulation 1357/2014/EU of 18 December 2014  
**Revised List of Wastes 2014** - Decision 2014/955/EU of 18 December 2014  
**7th ATP** - Regulation 2015/1221/EU of 24 July 2015  
**8th ATP** - Regulation (EU) 2016/918 of 19 May 2016  
**9th ATP** - Regulation (EU) 2016/1179 of 19 July 2016  
**10th ATP** - Regulation (EU) 2017/776 of 4 May 2017  
**HP14 amendment** - Regulation (EU) 2017/997 of 8 June 2017  
**13th ATP** - Regulation (EU) 2018/1480 of 4 October 2018  
**POPs Regulation 2004** - Regulation 850/2004/EC of 29 April 2004  
**1st ATP to POPs Regulation** - Regulation 756/2010/EU of 24 August 2010  
**2nd ATP to POPs Regulation** - Regulation 757/2010/EU of 24 August 2010

**Appendix 6**  
**Survey Data**



## Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
<b>Northern Site</b>					
<b>Boreholes</b>					
BH01	695779.910	753048.871	105.07	295849.826	253026.569
BH02	695848.293	752983.063	106.90	295918.224	252960.747
BH03	695671.978	752975.012	103.73	295741.871	252952.694
BH04	695769.585	752933.251	104.04	295839.500	252910.924
<b>Trial Pits</b>					
TP01	695759.260	752895.191	103.64	295829.173	252872.856
TP02	695735.616	753023.483	104.54	295805.523	253001.176
TP03	695871.684	753033.093	106.90	295941.620	253010.788
<b>Soakaway Tests</b>					
ST01	695687.527	752898.292	102.72	295757.424	252875.957
ST02	695728.109	752951.217	103.58	295798.015	252928.894
<b>California Bearing Ratio Tests</b>					
CBR01	695750.770	752879.557	103.28	295820.681	252857.218
CBR02	695666.644	752907.087	102.75	295736.537	252884.754
CBR03	695798.245	752919.412	104.05	295868.166	252897.082
CBR04	695880.961	753032.222	106.97	295950.899	253009.917
CBR05	695812.302	753056.179	105.06	295882.225	253033.879
CBR06	695720.777	753090.716	106.27	295790.680	253068.423
<b>Southern Site</b>					
<b>Boreholes</b>					
BH05	695720.420	752475.726	96.16	295790.328	252453.300
BH06	695799.102	752355.443	95.24	295869.028	252332.991
BH07	695869.490	752302.818	95.49	295939.431	252280.355
BH08	695790.859	752158.452	93.92	295860.785	252135.958
BH09	695926.768	752232.427	95.29	295996.722	252209.949
<b>Trial Pits</b>					
TP04	695836.347	752481.578	95.72	295906.280	252459.154
TP05	695703.699	752366.249	95.07	295773.604	252343.799
TP06	695856.180	752324.360	95.07	295926.118	252301.902
TP07	695870.674	752168.821	95.08	295940.617	252146.329
<b>Soakaway Tests</b>					
ST03	695806.251	752320.070	95.26	295876.179	252297.611
ST04	695791.761	752202.146	93.31	295861.687	252179.661
<b>California Bearing Ratio Tests</b>					
CBR07	695717.530	752450.071	96.66	295787.438	252427.639
CBR08	695791.573	752411.990	95.70	295861.497	252389.550
CBR09	695858.607	752405.028	95.19	295928.545	252382.587
CBR10	695707.294	752298.482	92.83	295777.201	252276.017
CBR11	695754.782	752181.316	92.75	295824.700	252158.826
CBR12	695813.031	752154.022	94.51	295882.962	252131.527
CBR13	695877.581	752129.271	95.58	295947.526	252106.771
CBR14	695906.248	752230.553	95.02	295976.198	252208.075
CBR15	695978.176	752285.274	95.39	296048.141	252262.808
CBR16	695854.046	752313.249	95.43	295923.984	252290.788

Legend Key

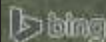
- ⊕ Locations By Type - CP
- Locations By Type - ICBR
- ⊠ Locations By Type - IP
- ⊞ Locations By Type - TP



Contract No:	5699
Contract Name:	Residential Development
Location:	Dunshaughlin, Co. Meath
Client:	Castlethorn Construction
Engineer:	Waterman Moylan
Title:	Site Plan
Scale:	1:1500
Drawn By:	SL







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Legend Key

-  Locations By Type - CP
-  Locations By Type - ICBR
-  Locations By Type - IP
-  Locations By Type - TP



Contract No:	5699
Contract Name:	Residential Development
Location:	Dunshaughlin, Co. Meath
Client:	Castlethorn Construction
Engineer:	Waterman Moylan
Title:	Site Plan
Scale:	1:2250
Drawn By:	SL



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