

PHOTOGRAPHIC LOG

Consultants in Engineering
and Environmental Sciences

www.fehilytimoney.ie



Client Name:
Monaghan Co. Council

Site Location: Killycard

Project Number: P1655

Photo No.
9

Date:
12/06/18

Description:

Northern section of site, looking westwards



Photo No.
10

Date:
12/06/18

Description:

Waste material protruding from northern boundary adjacent to surface water ditch



PHOTOGRAPHIC LOG

Consultants in Engineering
and Environmental Sciences

www.fehilytimoney.ie



Client Name:
Monaghan Co. Council

Site Location: Killycard

Project Number: P1655

Photo No.
11

Date:
12/06/18

Description:

Exposed waste material at western boundary of Corrinshigo Lake



Photo No.
12

Date:
12/06/18

Description:

Exposed waste material at western boundary of Corrinshigo lake



PHOTOGRAPHIC LOG

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and Environmental Sciences

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Client Name:
Monaghan Co. Council

Site Location: Killycard

Project Number: P1655

Photo No.
13

Date:
12/06/18

Description:

Waste material protruding from soil surface



Photo No.
14

Date:
12/06/18

Description:

Waste material protruding from soil surface



Appendix II

Causeway Geotechnical Reports

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CAUSEWAY
— GEOTECH

Monaghan Landfills Killycard – Ground Investigation

Client: Monaghan County Council

Client's Representative: Fehily Timoney

Report No.: 18-0838A

Date: October 2018

Status: Final for Issue

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APPENDICES

Appendix A	Site and exploratory hole location plans
Appendix B	Borehole logs
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Appendix D	Trial pit photographs
Appendix E	Variable head permeability test results
Appendix F	Geotechnical laboratory test results
Appendix G	Environmental laboratory test results

Document Control Sheet

Report No.:		18-0838A			
Project Title:		Monaghan Landfills - Killycard			
Client:		Monaghan County Council			
Client's Representative:		Fehily Timoney			
Revision:	A00	Status:	Final for Issue	Issue Date:	16 October 2018
Prepared by:		Reviewed by:		Approved by:	
 Sean Ross BSc MSc		 Matthew Gilbert MEarthSci FGS		 Darren O'Mahony BSc MSc MIEI	

The works were conducted in accordance with:

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

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

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

Laboratory testing was conducted in accordance with:

British Standards Institute BS 1377:1990 parts 2, 4, 5, 7 and 9

METHODS OF DESCRIBING SOILS AND ROCKS

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

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

Monaghan Landfills - Killycard

1 AUTHORITY

On the instructions of Fehily Timoney Consulting Engineers, (“the Client’s Representative”), acting on the behalf of Monaghan County Council (“the Client”), a ground investigation was undertaken at the above location to provide geotechnical and environmental information to aid in the remediation of an old landfill site.

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

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

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

2 SCOPE

The extent of the investigation, as instructed by the Client’s Representative, included boreholes, trial pits, soil sampling, in-situ and laboratory testing, and the preparation of a factual report on the findings.

3 DESCRIPTION OF SITE

As shown on the site location plan in Appendix A, the works were conducted on the site of an old landfill north west of Castleblaney, just off the R183. The site is bordered to the east by industrial units, to the west by Malone’s Lake and to the north by agricultural lands.

The site slopes gently downwards in the direction of Malone’s Lake within the area of the old landfill.

4 SITE OPERATIONS

4.1 Summary of site works

Site operations, which were conducted between 20th September and 1st October 2018, comprised:

- three boreholes by rotary drilling methods;
- standpipe installation in all three boreholes;
- thirteen machine dug trial pits; and
- variable head permeability tests in all boreholes.

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

4.2 Boreholes

Three boreholes (GW01 – GW03) were put to their completion by rotary drilling techniques only. The boreholes were completed using a Hanjin-8D tracked rotary rig.

Symmetrix-cased full hole rotary percussive drilling techniques were employed to advance the boreholes through overburden and bedrock to scheduled depths of 10m.

Any water strikes encountered during boring were recorded along with any changes in their levels as the borehole proceeded.

Where water was added to assist with boring, a note has been added to the log to account for same.

Appendix B presents the borehole logs.

4.3 Standpipe installations

A groundwater monitoring standpipe was installed in boreholes GW01 – GW03.

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

4.4 Trial Pits

Thirteen trial pits (TP01-TP13) were excavated using a 13t tracked excavator fitted with a 600mm wide bucket, to depths of 4.2 – 4.5m.

Environmental samples were taken at depths of 0.5m in TP04 and TP08.

Disturbed (bulk bag) samples were taken within the capping material of the landfill.

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

Appendix C presents the trial pit logs with photographs of the pits and arising provided in Appendix D.

4.5 Variable head permeability testing

In-situ permeability tests were carried out in all boreholes by variable head permeability methods, following development of the wells. Testing was carried out in accordance with the guidance as set out in BS EN ISO 22282-2: 2012

The permeabilities were calculated using Hvorslev's formula $k=A/FT$ as defined in BS 5930:1999 (pg 52).

The results are presented in Appendix E.

4.6 Surveying

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

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

4.7 Ground water and ground gas monitoring

Following completion of site works, ground water was conducted on one round. Ground water monitoring was carried out using a water interface probe.

The monitoring records are presented in Table 1 below.

Table 1 Results of groundwater monitoring undertaken on site

Date - 09/10/2018	Water Level (mbgl)
GW01	1.52
GW02	2.22
GW03	1.71

5 LABORATORY WORK

Upon their receipt in the laboratory, all disturbed samples were carefully examined and accurately described, and their descriptions incorporated into the borehole logs.

5.1 Geotechnical laboratory testing of soils

Laboratory testing of soils comprised:

- **soil classification:** moisture content measurement, Atterberg Limit tests and particle size distribution analysis.

Laboratory testing of soils samples was carried out in accordance with British Standards Institute: *BS 1377, Methods of test for soils for civil engineering purposes; Part 1 (2016), and Parts 2-9 (1990)*.

The test results are presented in Appendix B.

5.2 Environmental laboratory testing of soils

Environmental testing, in the form of WAC testing was conducted on two environmental soil samples by Chemtest at its laboratory in Newmarket, Suffolk.

Results of environmental laboratory testing are presented in Appendix G.

6 GROUND CONDITIONS

6.1 General geology of the area

Published geological mapping indicate the superficial deposits underlying the site comprise peat and glacial till. These deposits are underlain by sandstone and microconglomerate of the Oghill Formation.

6.2 Ground types encountered during investigation of the site

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

- **Topsoil:** encountered in all trial pits with thicknesses ranging between 50 – 100mm. Driller's logs record 500mm of topsoil, however as this was drilled via rotary percussion methods, depths are by visual observations of drilling returns.
- **Made Ground (sub-base):** 500mm of stone fill encountered in GW01 within the hardstanding area of the site, however as this was drilled via rotary percussion methods, depths are by visual observations of drilling returns.
- **Made Ground (fill):** reworked clay/silt fill with localised pockets of glass, plastic, wood, red brick and steel encountered down to a depth of 4.4m in TP08.
- **Made Ground (general waste):** black general waste encountered to a depth of 3.4m in TP11.
- **Recent deposits (peat):** spongy brown fibrous peat encountered in all trial pits except TP11, to a maximum depth of 4.5m in TP08.
- **Glacial Till:** silty clay, soft to firm encountered underlying the peat stratum in all trial pits to the maximum extent of the trial pit.
- **Bedrock (Limestone):** Rockhead was encountered at depths ranging from 5.5m in GW03 to about 6m in boreholes GW01 and GW02.

6.3 Groundwater

Groundwater was encountered during percussion boring through soil and trial pit excavations as water strikes as shown in Table 2 below.

Table 2 Groundwater strikes encountered during the ground investigation

GI Ref	Water Level (mbgl)	Comments
GW01	6.0	Very Strong
GW02	6.5	Very Strong
GW03	5.5	Very Strong
TP01	2.1	Fast flow
TP02	1.8	Flow
TP02	2.7	Fast flow
TP03	2.1	

TP04	4.1	Seepage
TP06	1.2	Heavy flow
TP07	1.0	Seepage
TP10	1.6	Seepage
TP11	3.0	Fast flow
TP12	2.8	Seepage
TP13	2.1	Fast flow

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

It should be noted that the casing used in supporting the borehole walls during drilling may have sealed out any additional groundwater strikes encountered.

It should be noted that any additional groundwater strikes within bedrock may have been masked by the fluid used as the drilling flush medium

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

7 REFERENCES

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

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

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

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

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

BS EN ISO 14688-2:2004+A1:2013: Geotechnical investigation and testing. Identification and classification of soil. Part 2 Principles for a classification.

BS EN ISO 22476-3:2005+A1:2011: Geotechnical investigation and testing. Field testing. Standard penetration test.

BS EN ISO 22282-2: 2012: Geotechnical investigation and testing. Geohydraulic testing – Part 2: Water permeability tests in a borehole using open systems.



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APPENDIX A
SITE AND EXPLORATORY HOLE LOCATION PLANS

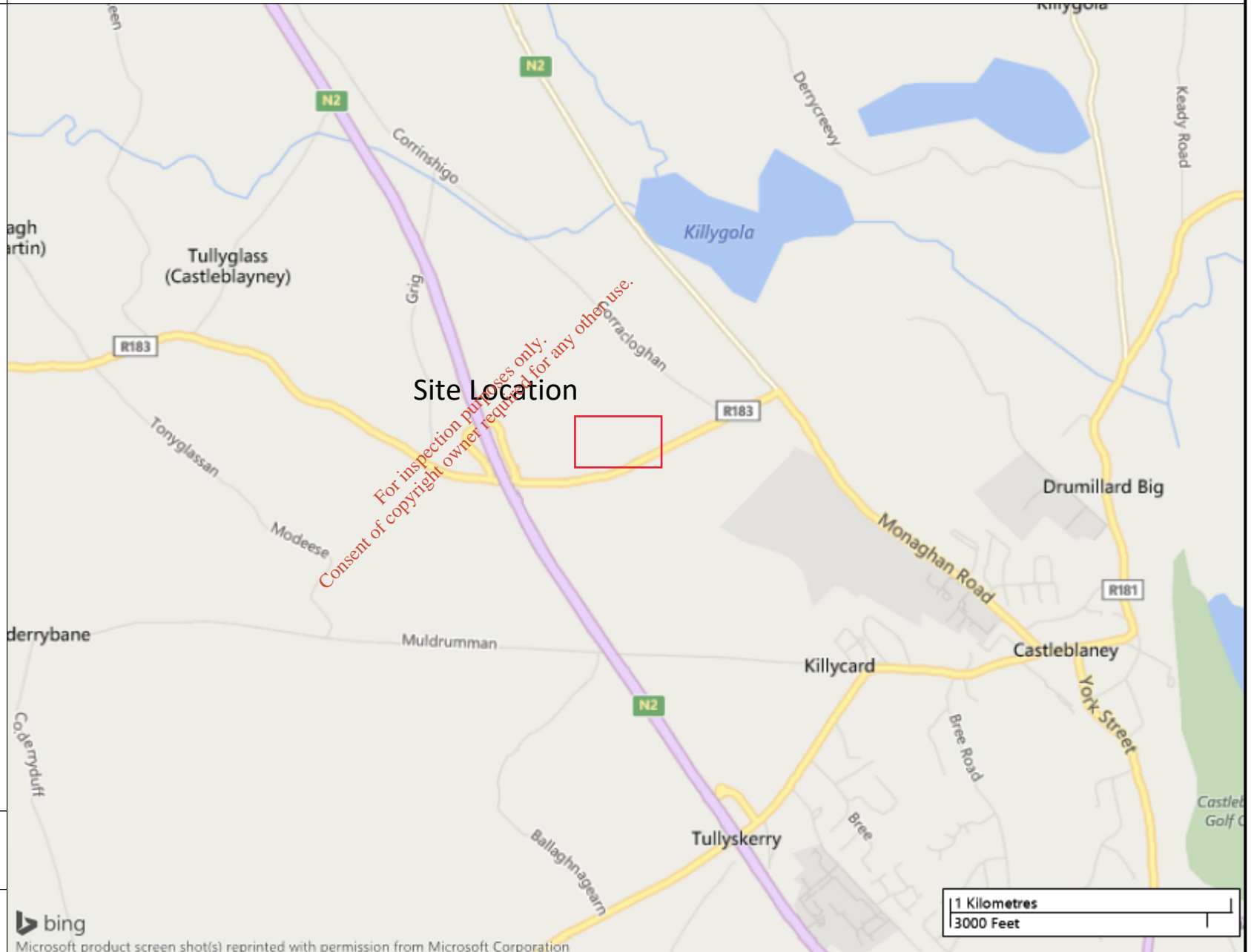
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Project No.: 18-0838A
Project Name: Monaghan Landfills - Killycard

Client: Monaghan County Council
Client's Representative: Fehily Timoney

Legend Key



Title:
Site Location Plan

Last Revised:
12/10/2018

Scale:
1:20000



Project No.: 18-0838A
Project Name: Monaghan Landfills - Killycard

Client: Monaghan County Council
Client's Representative: Fehily Timoney

Legend Key

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



Title:
Exploratory Hole Location Plan

Last Revised:
15/10/2018

Scale:
1:1000



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APPENDIX B
BOREHOLE LOGS

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GEOTECH

Project No.:
18-0838A

Coordinates:
281046.81 E
320409.37 N

Ground Level:
94.99 mOD

Project Name:
Monaghan Landfills - Killycard

Client:
Monaghan County Council

Client's Representative:
Fehily Timoney

Dates:
01/10/2018 - 01/10/2018

Borehole No.:
GW01

Sheet 1 of 1

Scale: 1:50

Driller: JR

Logger: CH

Method	Plant Used	Top	Base
Rotary Drilling	Hanjin 8D	0.00	10.00

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
						(1.00)	[Cross-hatch pattern]	MADE GROUND: Stone fill (Driller's description)		
					93.98	1.00	[Cross-hatch pattern]	MADE GROUND: Rubbish (Driller's description)		
						(1.40)	[Cross-hatch pattern]			
					92.58	2.40	[Silt pattern]	PEAT (Driller's description)		
						(2.40)	[Silt pattern]			
					90.18	4.80	[Silt pattern]	Soft grey SILT (Driller's description)		
						(1.20)	[Silt pattern]			
				Heavy water strike at 6.00m	88.98	6.00	[Limestone pattern]	Weathered LIMESTONE (Driller's description)		
						(0.50)	[Limestone pattern]			
					88.48	6.50	[Limestone pattern]	Black LIMESTONE (Driller's description)		
						(3.50)	[Limestone pattern]			
					84.98	10.00		End of Borehole at 10.00m		

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Remarks

Terminated at scheduled depth

Water Strikes				Chiselling Details		
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)
6.00	6.00					
Water Added		Casing Details				
From (m)	To (m)	To (m)	Diam (mm)			



CAUSEWAY
GEOTECH

Project No.:
18-0838A

Coordinates:
281043.46 E
320496.70 N

Ground Level:
95.48 mOD

Project Name:
Monaghan Landfills - Killycard

Client:
Monaghan County Council

Client's Representative:
Fehily Timoney

Dates:
28/09/2018 - 28/09/2018

Borehole No.:
GW02

Sheet 1 of 1

Scale: 1:50

Driller: JR

Logger: CH

Method	Plant Used	Top	Base
Rotary Drilling	Hanjin 8D	0.00	10.00

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
					95.38	(0.10)	[Pattern]	TOPSOIL (Driller's description)		
						(0.40)	[Pattern]	MADE GROUND: CLAY (Driller's description)		
					94.98	0.50	[Pattern]	MADE GROUND: Rubbish -paper and plastic (Driller's description)		
						(1.90)	[Pattern]			
					93.08	2.40	[Pattern]	PEAT (Driller's description)		
						(2.20)	[Pattern]			
					90.88	4.60	[Pattern]	Soft grey SILT (Driller's description)		
						(1.40)	[Pattern]			
					89.48	6.00	[Pattern]	Weathered LIMESTONE (Driller's description)		
						(0.50)	[Pattern]			
				Strong water strike at 6.5m	88.98	6.50	[Pattern]	Black LIMESTONE (Driller's description)		
						(3.50)	[Pattern]			
					85.48	10.00		End of Borehole at 10.00m		

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Remarks

Terminated at scheduled depth

Water Strikes				Chiselling Details		
Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)
6.50	6.50					
Water Added		Casing Details				
From (m)	To (m)	To (m)	Diam (mm)			



CAUSEWAY
GEOTECH

Project No.:
18-0838A

Coordinates:
280944.93 E
320397.10 N

Ground Level:
93.87 mOD

Project Name:
Monaghan Landfills - Killycard

Client:
Monaghan County Council

Client's Representative:
Fehily Timoney

Dates:
27/09/2018 - 27/09/2018

Borehole No.:
GW03

Sheet 1 of 1

Scale: 1:50

Driller: JR

Logger: CH

Method	Plant Used	Top	Base
Rotary Drilling	Hanjin 8D	0.00	10.00

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water	Backfill
					93.77	(0.10)	[Cross-hatch pattern]	TOPSOIL (Driller's description)		
						(0.40)	[Cross-hatch pattern]	MADE GROUND: CLAY (Driller's description)		
					93.37	0.50	[Cross-hatch pattern]	MADE GROUND: Rubbish-plastic and paper (Driller's description)		
						(1.50)	[Cross-hatch pattern]			
					91.87	2.00	[Silt pattern]	PEAT (Driller's description)		
						(2.00)	[Silt pattern]			
					89.87	4.00	[Silt pattern]	Soft grey SILT (Driller's description)		
						(1.50)	[Silt pattern]			
				Strong water seepage at 5.50m	88.37	5.50	[Brick pattern]	Black LIMESTONE (Driller's description)		
						(4.50)	[Brick pattern]			
					83.87	10.00	[Brick pattern]			

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Remarks Terminated at scheduled depth	Water Strikes				Chiselling Details		
	Struck at (m)	Casing to (m)	Time (min)	Rose to (m)	From (m)	To (m)	Time (hh:mm)
	5.50	5.50					
	Water Added		Casing Details				
From (m)	To (m)	To (m)	Diam (mm)				



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APPENDIX C
TRIAL PIT LOGS

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CAUSEWAY
GEOTECH

Project No.:

18-0838A

Project Name:

Monaghan Landfills - Killycard

Trial Pit No.:

TP01

Co-ordinates:

280945.02 E

Client:

Monaghan County Council

Sheet 1 of 1

Method:

Trial Pitting

320406.91 N

Client's Representative:

Fehily Timoney

Scale: 1:25

Plant:

13T Tracked Excavator

Ground Level:

93.91 mOD

Date:

20/09/2018

Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.50	B1	Fast flow at 2.10m	93.81	(0.10) 0.10		TOPSOIL	Water level indicated by inverted triangle at 2.10m
			93.31	(0.50) 0.60		MADE GROUND: Firm brown slightly sandy slightly gravelly SILT with fragments of plastic glass and rope. Sand is fine to coarse. Gravel is angular fine to coarse.	
			91.71	(1.60) 2.20		MADE GROUND: Black waste - 40% plastic, 5% glass bottles, fertiliser bags, shoes, mattress, steel pipe, cloths and 2 rolls of industrial cardboard.	
			90.51	(4.20) 3.40		Spongy brown fibrous PEAT.	
			89.41	(1.10) 4.50		Soft bluish grey silty CLAY.	
						End of trial pit at 4.50m	

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Remarks Terminated at scheduled depth	Water Strikes:		Stability: Unstable
	Struck at (m):	Remarks:	
	2.10	Fast flow at 2.10m	Width: 1.00 Length: 2.80



CAUSEWAY
GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP02
Co-ordinates: 280935.21 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13T Tracked Excavator	Ground Level: 93.85 mOD	Date: 20/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.50	B1	Flow at 1.80m	93.75	(0.10) 0.10		TOPSOIL	Water level indicated by inverted triangles at approximately 2.0m and 2.5m depth.
			93.15	(0.60)		MADE GROUND: Brown slightly sandy gravelly SILT with foam, papers, plastic and glass bottles. Sand is fine to coarse. Gravel is subangular fine to coarse.	
			91.25	(0.70)		MADE GROUND: Black waste- 50% plastic, 5% glass bottles, planks of wood, foam, plastic, pipes, kitchen knife, metal straps, shoes, wellies.	
			91.25	(1.90)		Spongy brown fibrous PEAT.	
			89.65	(1.60)		Soft bluish grey silty CLAY.	
89.35	4.50				End of trial pit at 4.50m		

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Remarks Terminated at scheduled depth	Water Strikes:		Stability: Unstable
	Struck at (m):	Remarks:	
	1.80 2.70	Flow at 1.80m Fast flow at 2.70m	Width: 1.00 Length: 3.30



CAUSEWAY
GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP03
Co-ordinates: 280958.64 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13T Tracked Excavator	Ground Level: 94.15 mOD	Date: 20/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.30	B1		94.04	(0.10) 0.10		TOPSOIL	
			93.74	(0.30) 0.40		MADE GROUND: Firm brownish grey slightly sandy slightly gravelly SILT with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse. Cobbles are subrounded.	
				(1.90)		MADE GROUND: Brownish black waste. 30% office waste, shredded paper, old clothes, mattress springs, zinc, wood, shoes, tiles, blankets and fertiliser bags.	
			91.84	2.30		Spongy brown fibrous PEAT.	
			90.54	3.60		Bluish grey silty CLAY.	
			89.94	4.20		End of trial pit at 4.20m	

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Remarks Terminated on possible bedrock	Water Strikes:		Stability: Stable
	Struck at (m):	Remarks:	
	2.10	Fast flow at 2.10m	Width: 1.00
		Length: 4.10	



CAUSEWAY
GEOTECH

Project No.:

18-0838A

Project Name:

Monaghan Landfills - Killycard

Trial Pit No.:

TP04

Co-ordinates:

280968.11 E

Client:

Monaghan County Council

Sheet 1 of 1

Method:

Trial Pitting

Ground Level:

94.29 mOD

Client's Representative:

Fehily Timoney

Scale: 1:25

Plant:

13T Tracked Excavator

Date:

21/09/2018

Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
			94.19	(0.10) 0.10		TOPSOIL	
0.50	B1			(0.50)		MADE GROUND: Firm brown slightly sandy slightly gravelly SILT with fragments of plastic. Sand is fine to coarse. Gravel is subangular fine to coarse.	
0.50	ES2		93.69	0.60		MADE GROUND: Black waste- 40%plastic, fertliser bags, 10% glass bottles, shoes, clothes.	
				(1.50)			
			92.19	2.10		Spongy brown fibrous PEAT.	
				(2.10)			
		Seepage at 4.10m	90.09	4.20		Soft bluish grey silty CLAY.	
				(0.30)			
			89.79	4.50		End of trial pit at 4.50m	

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Remarks Terminated at scheduled depth	Water Strikes:		Stability: Stable
	Struck at (m):	Remarks:	
	4.10	Seepage at 4.10m	Width: 1.10 Length: 4.10



CAUSEWAY
GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP05
Co-ordinates: 280978.92 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13T Tracked Excavator	Ground Level: 93.88 mOD	Date: 20/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.40	B1		93.83	(0.05)		TOPSOIL	
				(0.45)		MADE GROUND: Soft brownish grey slightly sandy slightly gravelly SILT with plastic, old clothes, red brick, metal wires, blankets. Sand is fine to coarse. Gravel is subangular fine to coarse.	
			93.38	0.50		MADE GROUND: Black waste-60% plastic, 10% clothes, 5% glass bottles. Wood, plastic bottles, metal pipes.	
				(1.70)			
			91.68	2.20		Spongy brown fibrous PEAT.	
				(1.60)			
			90.08	3.80		Firm blue silty CLAY.	
				(0.70)			
			89.38	4.50		End of trial pit at 4.50m	

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Remarks No groundwater encountered Terminated at scheduled depth	Water Strikes:		Stability: Stable
	Struck at (m):	Remarks:	
			Width: 1.00 Length: 3.10



CAUSEWAY
GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP06
Co-ordinates: 280995.49 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13T Tracked Excavator	Ground Level: 93.95 mOD	Date: 20/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.50	B1	Significant flow at 1.20m	93.85	(0.10) 0.10		TOPSOIL	
				(0.70)		MADE GROUND: Firm brown slightly sandy slightly gravelly SILT with fragments of red brick, pipes, plastic, steel pipes, glass bottles. Sand is fine to coarse. Gravel is subangular fine to coarse.	
			93.15	0.80		MADE GROUND: Firm greyish black slightly sandy slightly gravelly CLAY with plastic, ropes, glass bottles and metal wires. Sand is fine to coarse. Gravel is subangular fine to coarse.	
				(1.60)		Spongy brown fibrous PEAT.	
			91.55	2.40		Firm bluish grey silty CLAY.	
			89.95	4.00		End of trial pit at 4.50m	
			89.45	4.50			

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Remarks Terminated at scheduled depth	Water Strikes:		Stability: Unstable
	Struck at (m):	Remarks:	
	1.20	Significant flow at 1.20m	Width: 0.90 Length: 2.90



CAUSEWAY
GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP07
Co-ordinates: 281032.63 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13T Tracked Excavator	Ground Level: 94.14 mOD	Date: 20/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.50	B1	Seepage at 1.00m	94.04	(0.10) 0.10		TOPSOIL	
				(0.50)		MADE GROUND: Firm brown sandy gravelly SILT with low cobble content and fragments of red brick and plastic. Sand is fine to coarse. Gravel is subangular fine to coarse.	
			93.54	0.60		MADE GROUND: Firm greyish black slightly sandy slightly gravelly CLAY with fragments of plastic, old wires, wood, glass bottles and milk cartons. Sand is fine to coarse. Gravel is angular fine to coarse.	
				(1.30)			
			92.24	1.90		Spongy brown fibrous PEAT.	
				(4.80)			
			90.44	3.70		Firm bluish grey silty CLAY.	
				(0.80)			
			89.64	4.50		End of trial pit at 4.50m	

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Remarks Terminated at scheduled depth	Water Strikes:		Stability: Unstable
	Struck at (m):	Remarks:	
	1.00	Seepage at 1.00m	Width: 1.80 Length: 2.40



CAUSEWAY
GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP08
Co-ordinates: 281016.01 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13T Tracked Excavator	Ground Level: 94.42 mOD	Date: 21/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
			94.32	(0.10) 0.10		TOPSOIL	
0.50	B1			(0.50)		MADE GROUND: Firm brown slightly sandy slightly gravelly SILT with low cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse. Cobbles are angular.	
0.50	ES2		93.82	0.60		MADE GROUND: Black waste- plastic, wires and ropes.	
				(0.50)			
			93.32	1.10		MADE GROUND: Firm grey slightly sandy slightly gravelly CLAY with medium cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse. Cobbles are angular.	
				(3.30)			
			90.02	4.40		Spongy brown fibrous PEAT.	
			89.92	(0.10) 4.50		End of trial pit at 4.50m	

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Remarks No groundwater encountered Terminated at scheduled depth	Water Strikes:		Stability: Stable
	Struck at (m):	Remarks:	
			Width: 1.00 Length: 4.30



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GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP09
Co-ordinates: 281008.90 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13T Tracked Excavator	Ground Level: 94.52 mOD	Date: 20/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.50	B1		94.42	(0.10) 0.10		TOPSOIL	
				(0.50)		MADE GROUND: Firm light brown slightly sandy slightly gravelly SILT with fragments of plastic. Sand is fine to coarse. Gravel is subangular.	
			93.92	0.60		MADE GROUND: Brownish black waste- 60 percent plastic, 10% clothes, glass bottles and pipes.	
				(2.10)			
			91.82	2.70		Spongy brown fibrous PEAT.	
				(0.80)			
			91.02	3.50		Soft bluish grey silty CLAY.	
				(1.00)			
			90.02	4.50		End of trial pit at 4.50m	

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Remarks No groundwater encountered Terminated at scheduled depth	Water Strikes:		Stability: Stable
	Struck at (m):	Remarks:	
			Width: 1.10 Length: 3.90



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GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP10
Co-ordinates: 280992.40 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13T Tracked Excavator	Ground Level: 94.65 mOD	Date: 20/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.50	B1	Seepage at 1.60m	94.60	(0.05)		TOPSOIL	▼
				(0.55)		MADE GROUND: Firm brownish grey slightly sandy slightly gravelly SILT with low cobble content and fragments of plastic. Sand is fine to coarse. Gravel is subangular fine to coarse. Cobbles are angular.	
			94.05	0.60		MADE GROUND: Black waste- 30% plastic, old clothes, glass bottles and metal pipes.	
				(1.30)		Spongy brown fibrous PEAT.	
			92.75	1.90		Spongy brown fibrous PEAT.	
				(1.30)		Soft bluish grey silty CLAY.	
			91.45	3.20		Soft bluish grey silty CLAY.	
				(1.30)			
			90.15	4.50		End of trial pit at 4.50m	

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Remarks Terminated at scheduled depth	Water Strikes:		Stability: Stable
	Struck at (m):	Remarks:	
	1.60	Seepage at 1.60m	Width: 1.00 Length: 3.10



CAUSEWAY
GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP11
Co-ordinates: 281036.50 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13.5T Tracked Excavator	Ground Level: 95.07 mOD	Date: 20/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.40	B1		95.02	(0.05)		TOPSOIL	
				(0.45)		MADE GROUND: Firm brown slightly sandy slightly gravelly SILT. Sand is fine to coarse. Gravel is subrounded fine to coarse.	
			94.57	0.50		MADE GROUND: - Black waste-50% plastic, 10% rubber, 15% glass bottles. Washing machines, cups, springs, coal bags, clothes, nets, planks of wood and fertiliser bags.	0.5
				(2.90)			1.0
							1.5
							2.0
							2.5
		Fast flow at 3.00m					3.0
			91.67	3.40		Soft blue silty CLAY.	3.5
				(0.90)			4.0
			90.77	4.30		End of trial pit at 4.30m	4.5

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Remarks Terminated due to pit walls collapsing	Water Strikes:		Stability: Unstable
	Struck at (m):	Remarks:	
	3.00	Fast flow at 3.00m	Width: 1.80 Length: 3.80



CAUSEWAY
GEOTECH

Project No.:

18-0838A

Project Name:

Monaghan Landfills - Killycard

Trial Pit No.:

TP12

Co-ordinates:

281045.85 E

Client:

Monaghan County Council

Sheet 1 of 1

Method:

Trial Pitting

320475.04 N

Client's Representative:

Fehily Timoney

Scale: 1:25

Plant:

13T Tracked Excavator

Ground Level:

95.21 mOD

Date:

20/09/2018

Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.20	B1		95.16	(0.05)		TOPSOIL	
				(0.25)		MADE GROUND: Firm light brown slightly sandy slightly gravelly SILT with pieces of plastic. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
			94.91	0.30		MADE GROUND: Soft brown slightly sandy slightly gravelly CLAY with plastic, glass bottles, planks of wood, red brick, clothes and fertiliser bags. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.	
				(1.30)			
			93.61	1.60		MADE GROUND: Firm grey slightly sandy slightly gravelly CLAY with fragments of plastic pipe and wire. Sand is fine to coarse,. Gravel is subangular to subrounded fine to coarse.	
				(1.10)			
		Seepage at 2.80m	92.51	2.70		Spongy brown fibrous PEAT.	
				(1.00)			
			91.51	3.70		Soft bluish grey silty CLAY.	
				(0.80)			
			90.71	4.50		End of trial pit at 4.50m	

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Remarks Terminated at scheduled depth	Water Strikes:		Stability: Stable
	Struck at (m):	Remarks:	
	2.80	Seepage at 2.80m	Width: 1.00 Length: 4.10



CAUSEWAY
GEOTECH

Project No.: 18-0838A	Project Name: Monaghan Landfills - Killycard	Trial Pit No.: TP13
Co-ordinates: 281077.69 E	Client: Monaghan County Council	Sheet 1 of 1
Method: Trial Pitting	Client's Representative: Fehily Timoney	Scale: 1:25
Plant: 13T Tracked Excavator	Ground Level: 94.94 mOD	Date: 21/09/2018
		Logger: GH

Depth (m)	Sample / Tests	Field Records	Level (mOD)	Depth (m) (Thickness)	Legend	Description	Water
0.50	B1	Fast flow at 2.10	94.84	(0.10) 0.10		TOPSOIL	▼
			94.34	(0.50)		MADE GROUND: Firm brown slightly gravelly sandy CLAY with fragments of plastic, milk cartons, glass bottles, coal bags and fertiliser bags. Sand is fine to coarse. Gravel is subangular fine to coarse.	
			94.34	0.60		MADE GROUND: Black waste - steel pipes, 30% plastic, 10% clothes.	
			93.64	1.30		MADE GROUND: Soft brownish grey slightly sandy gravelly CLAY with high cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse. Cobbles are angular.	
			92.54	2.40		Spongy brown fibrous PEAT.	
			91.14	3.80		Soft bluish grey silty CLAY.	
			90.44	4.50		End of trial pit at 4.50m	

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Remarks Terminated at scheduled depth	Water Strikes:		Stability: Unstable
	Struck at (m):	Remarks:	
	2.10	Fast flow at 2.10	Width: 1.40 Length: 4.30



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APPENDIX D
TRIAL PIT PHOTOGRAPHS

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