

Castlepollard Quarry, Deerpark, Castlepollard, Co. Westmeath

Castlepollard Quarry

Environmental Impact Assessment Report

Appendix 7.2

Borehole Lithology and Construction Logs

February 2022



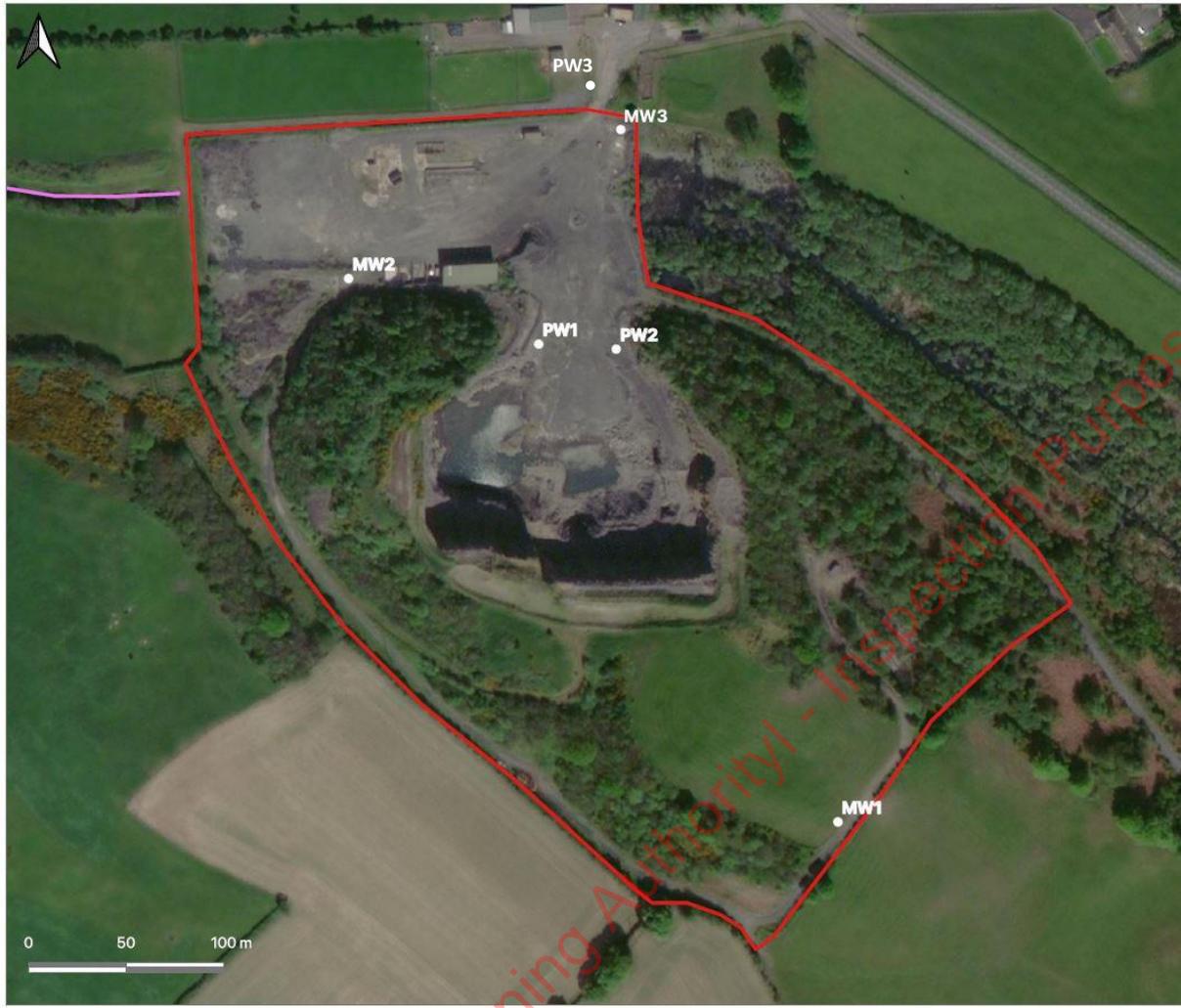
Part of the Breedon Group

Prepared by:

J Sheils Planning & Environmental Ltd

31 Athlumney Castle, Navan, Co. Meath

Westmeath County Council Planning Authority - Inspection Purposes Only



Drill Locations Castlepollard:

- PW1, PW2, PW3 = Water Wells for Yield Testing
- MW1, MW2, MW3 = Site Investigation Boreholes with 50mm diameter Piezometer installations for Long Term Monitoring Points

 = Proposed Working Site Boundary

	Drilling ID: PW1 Castelpollard 2021
	Site: Lagan (Breedon Group) Quarry @ Castelpollard, Co. Westmeath
	Site Location: Townland = Deerpark (Fore By)
	Hydro-G Project Ref: 21-P15 Castelpollard
National Grid Co-ordinates: Easting 647686, Northing 768396	

Client:	Lagan (Breedon Group)
Date Drilled:	06/04/2021
Drilled By:	P Briody & Sons Ltd. (Aidan Drilling)
Method:	DTH Hammer & Compressed Air flush with Atlas Compco Stand alone compressor.
Logged By:	Pamela Bartley
BH Location on Site:	Looking into the extraction area, on the RHS at entrance to rock extraction area.
BH Depth (m)	21m
BH GL Elevation (m OD)	87.538m OD
BH BASE Elevation (m OD)	66.5m OD
Proposed Future Floor Elevation (m OD)	70m OD

Important Note: This is a BH Log created from Observations during drilling with a Rotary HAMMER Rig rather than Rotary CORE. This log is a description by a hydrogeologist with hydrology, hydrogeological and civil engineering expertise.

Depth (m bgl)	Elevation (m OD)	Description	Colour	Water Strike (m bgl)	Drill Diameter	Installation Details		Drilling Notes
0	87.5	broken floor to 0.3m			12" (300mm)		12" diameter Steel (1.2m AGL, 4.8m bgl)	<p>Water Level 24/8/21 = 3.27 m bgl</p> <p>Proposed Floor Elevation 70m OD</p> <p>Small Water strike @ 19.5m bgl @ drilling time estimate 1.5m3/d = equivalent to 1.5 homes daily supply</p>
1	86.5	Solid Limestone	NAVY Blue	none	8" (200mm)		OPEN HOLE TO BASE @ 21m bgl (68m OD)	
2	85.5							
3	84.5							
4	83.5							
5	82.5							
6	81.5							
7	80.5							
8	79.5							
9	78.5							
10	77.5							
11	76.5							
12	75.5							
13	74.5							
14	73.5							
15	72.5							
16	71.5							
17	70.5							
18	69.5							
19	68.5	Sandy clayey Layer	dirty orange	1.5m3/d				
20	67.5	Solid Limestone	Navy Blue	no more water				
21	66.5							

END BH @ 21m bgl = 66.5m OD

Notes:

Drilled BH base is 4.5m below proposed floor elevation.

1.5m3/d = Small Water Strike @ 3m below proposed floor level.

YIELD TESTED using Submersible Pump by Envirollogic confirms Drilling Time yield estimate of ~1.5m3/hr

Water Level: 24/8/21 = 3.27m bgl

Westmeath County Council Planning Authority - Inspection Purposes Only!

		Drilling ID: PW2 Lagan 2021					
		Site: Lagan (Breedon Group) Quarry @ Castlepollard, Co. Westmeath					
		Site Location: Townland = Deerpark (Fore By)					
		Hydro-G Project Ref: 21-P15 Castlepollard					
		National Grid Co-ordinates: Easting 647726; Northing 768393					
Client:	Lagan (Breedon Group)						
Date Drilled:	07/04/2021						
Drilled By:	P Briody & Sons Ltd. (Aidan Drilling)						
Method:	DTH Hammer & Compressed Air flush with Atlas Compco Stand alone compressor.						
Logged By:	Pamela Bartley						
BH Location on Site:	Looking into the extraction area, on the LHS at entrance to rock extraction area.						
BH Depth (m)	21m						
BH GL Elevation (m OD)	87.915m OD						
BH BASE Elevation (m OD)	67.9m OD						
Proposed Future Floor Elevation (m OD)	70m OD						
<p>Important Note: This is a BH Log created from Observations during drilling with a Rotary HAMMER Rig rather than Rotary CORE. This log is a description by a hydrogeologist with hydrology, hydrogeological and civil engineering expertise.</p>							
Depth (m bgl)	Elevation (m OD)	Description	Colour	Water Strike (m bgl)	Drill Diameter	Installation Details	Drilling Notes
0	88.9	broken floor to 0.3m			12"	12" diameter Steel (1.2m AGL, 4.8m bgl)	
1	87.9	Solid Limestone	NAVY Blue	none	(300mm)		OPEN HOLE TO BASE @ 21m bgl (68m OD)
2	86.9						
3	85.9						
4	84.9						
5	83.9						
6	82.9						
7	81.9						
8	80.9						
9	79.9						
10	78.9						
11	77.9						
12	76.9						
13	75.9						
14	74.9						
15	73.9						
16	72.9						
17	71.9						
18	70.9		Proposed Floor Elevation 70m OD				
19	69.9						
20	68.9	Sandy clayey Layer	dirty orange	1.5m3/d			Small Water strike @ 20m bgl @ drilling time estimate 1.5m3/d = equivalent to 1.5 homes daily supply requirement.
21	67.9	Solid Limestone	Navy Blue				
END BH @ 21m bgl = 67.88m OD							
		Notes:					
		<p>BH base is 3m below proposed floor elevation. 1.5m3/d = Small Water Strike @ 2m below proposed floor level.</p> <p>YIELD TESTED using Submersible Pump by Envirollogic confirms Drilling Time yield estimate of ~1.5m3/hr</p>					
Water Level:		27/05/2021 = 0.8m bcl					

Westmeath County Council Planning Authority - Inspection Purposes Only!



Drilling ID: PW3 Castlepollard 2021

Site:	Lagan (Breedon Group) Quarry @ Castlepollard, Co. Westmeath
Site Location:	Townland = Deerpark (Fore By)
Hydro-G Project Ref:	21-P15 Castlepollard
National Grid Co-ordinates:	Easting 647711; Northing 768549

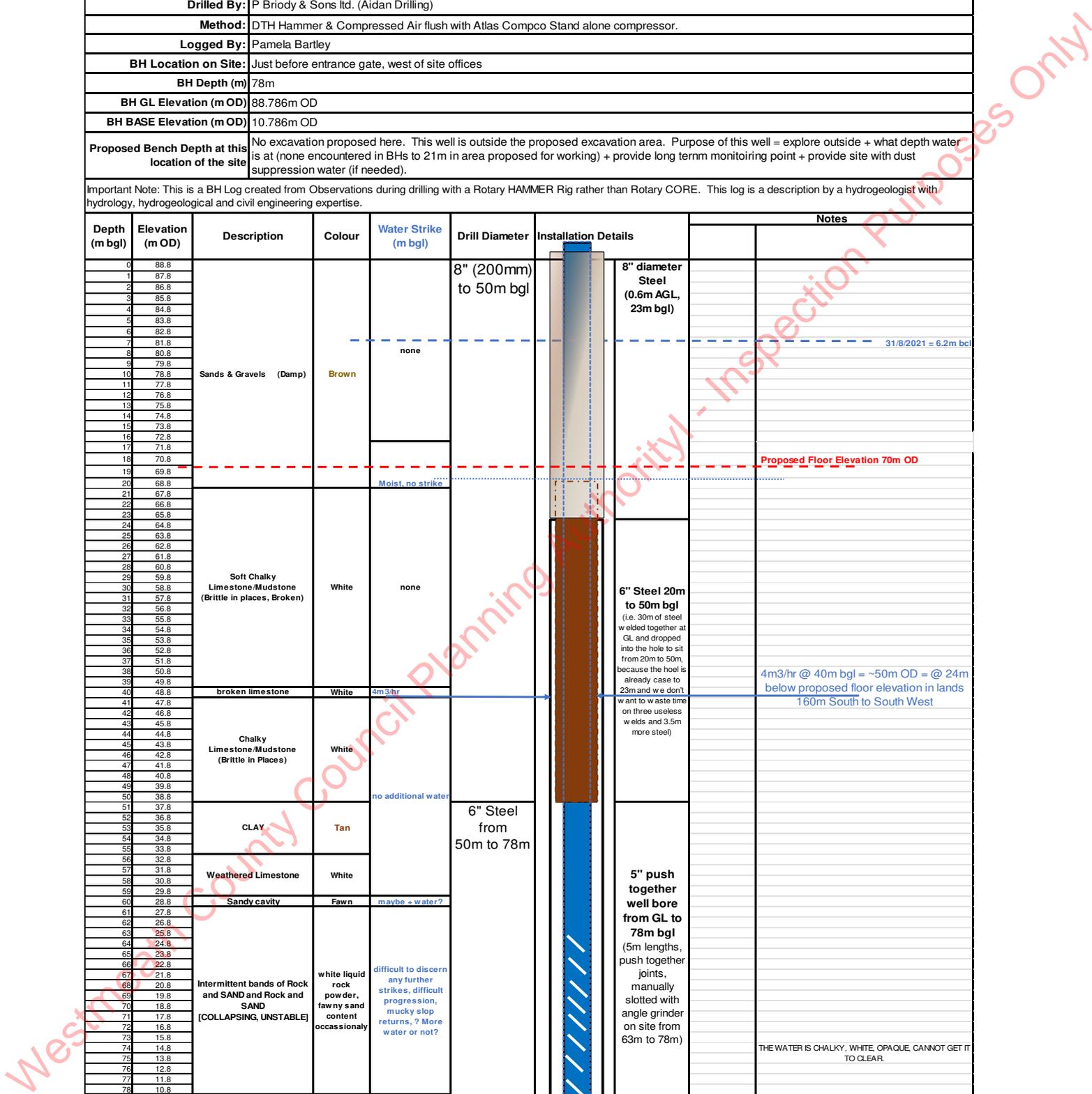
Client:	Lagan (Breedon Group)
Date Drilled:	24/08/2021
Drilled By:	P Briody & Sons Ltd. (Aidan Drilling)
Method:	DTH Hammer & Compressed Air flush with Atlas Compco Stand alone compressor.
Logged By:	Pamela Bartley
BH Location on Site:	Just before entrance gate, west of site offices
BH Depth (m)	78m
BH GL Elevation (m OD)	88.786m OD
BH BASE Elevation (m OD)	10.786m OD

Proposed Bench Depth at this location of the site
 No excavation proposed here. This well is outside the proposed excavation area. Purpose of this well = explore outside + what depth water is at (none encountered in BHs to 21m in area proposed for working) + provide long term monitoring point + provide site with dust suppression water (if needed).

Important Note: This is a BH Log created from Observations during drilling with a Rotary HAMMER Rig rather than Rotary CORE. This log is a description by a hydrogeologist with hydrology, hydrogeological and civil engineering expertise.

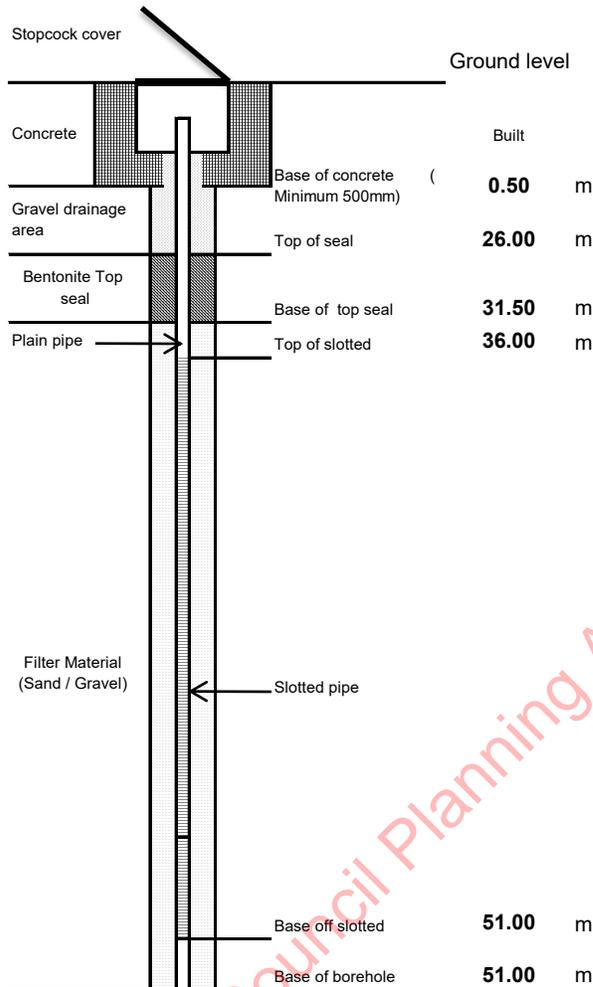
Depth (m bgl)	Elevation (m OD)	Description	Colour	Water Strike (m bgl)	Drill Diameter	Installation Details	Notes		
0	88.8				8" (200mm) to 50m bgl	8" diameter Steel (0.6m AGL, 23m bgl)			
1	87.8								
2	86.8								
3	85.8								
4	84.8								
5	83.8								
6	82.8								
7	81.8								
8	80.8								
9	79.8								
10	78.8	Sands & Gravels (Damp)	Brown	none					31/8/2021 = 6.2m bcl
11	77.8								
12	76.8								
13	75.8								
14	74.8								
15	73.8								
16	72.8								
17	71.8								
18	70.8								
19	69.8								Proposed Floor Elevation 70m OD
20	68.8			Moist, no strike					
21	67.8								
22	66.8								
23	65.8								
24	64.8								
25	63.8								
26	62.8								
27	61.8								
28	60.8								
29	59.8	Soft Chalky Limestone/Mudstone (Brittle in places, Broken)	White	none					
30	58.8								
31	57.8								
32	56.8								
33	55.8								
34	54.8								
35	53.8								
36	52.8								
37	51.8								
38	50.8								
39	49.8								
40	48.8	broken limestone	White	4m 3hr					
41	47.8								
42	46.8								
43	45.8								
44	44.8								
45	43.8	Chalky Limestone/Mudstone (Brittle in Places)	White						
46	42.8								
47	41.8								
48	40.8								
49	39.8								
50	38.8			no additional water					
51	37.8								
52	36.8								
53	35.8								
54	34.8								
55	33.8								
56	32.8								
57	31.8								
58	30.8								
59	29.8								
60	28.8	Sandy cavity	Fawn	maybe + water?					
61	27.8								
62	26.8								
63	25.8								
64	24.8								
65	23.8								
66	22.8								
67	21.8								
68	20.8	Intermittent bands of Rock and SAND and Rock and SAND [COLLAPSING, UNSTABLE]	white liquid rock powder, fawnry sand content occasionally	difficult to discern any further strikes, difficult progression, mucky slop returns, ? More water or not?					
69	19.8								
70	18.8								
71	17.8								
72	16.8								
73	15.8								
74	14.8								
75	13.8								
76	12.8								
77	11.8								
78	10.8								

END BH @ 78m bgl = 11.82m OD	Notes:
BH Base is 62m below the proposed floor elevation. Water Strike is 22m below proposed floor elevation. No excavation planned here.	Drilling Estimated Yield = 3 to 4m3/hr = 75 to 100 m3/d encountered at a depth of 40m bgl. DID NOT SUSTAIN IN PUMP TEST. Actual Yield = ~5m3/d @ 40m bgl @ ~50m OD @ ~160m from proposed excavation.
Water Level:	31/8/2021 = 6.2m bcl



Summary of Standpipe Installation

Schematic Diagram (not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	120	mm
Slot size	1	mm
Geosock	No	
Gas tap	None	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	Dry	m
Time of Initial reading	1245	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	26.00	0.50
Borehole seal top	31.50	26.00
Filter zone	51.00	31.50
Plain pipe	36.00	GL
Slotted zone	51.00	36.00
Base of borehole	51.00	

Remarks

2nd bentonite seal 4 to 2.5m

Rig type	Knebel HY79	Project Title			
Drilling Crew Details		Castlepollard Quarry			
Support Operative	John Whyte	Project No		21-Dec	
Lead Driller	Stephan Petersen	Day	Tuesday	Date	April 20, 2021
Site category	Green	Borehole Number			
Engineer		MW 1			
Lead Driller's signature					

Petersen Drilling Services Ltd.

on behalf of

Lagan

Rotary Drilling Log



Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details					Drilling Details					Standard Penetration Test												
		No	Type	In situ test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)	
0.00	Firm dark brown sandy gravelly CLAY medium cobble content		RO		0.00	18.00		0000		100	brown												0.00	0.00
4.60	Firm occasionally Soft brown orangish CLAY with very frequent angular limestone fragments likely very fractured LIMESTONE (fault infill)																							

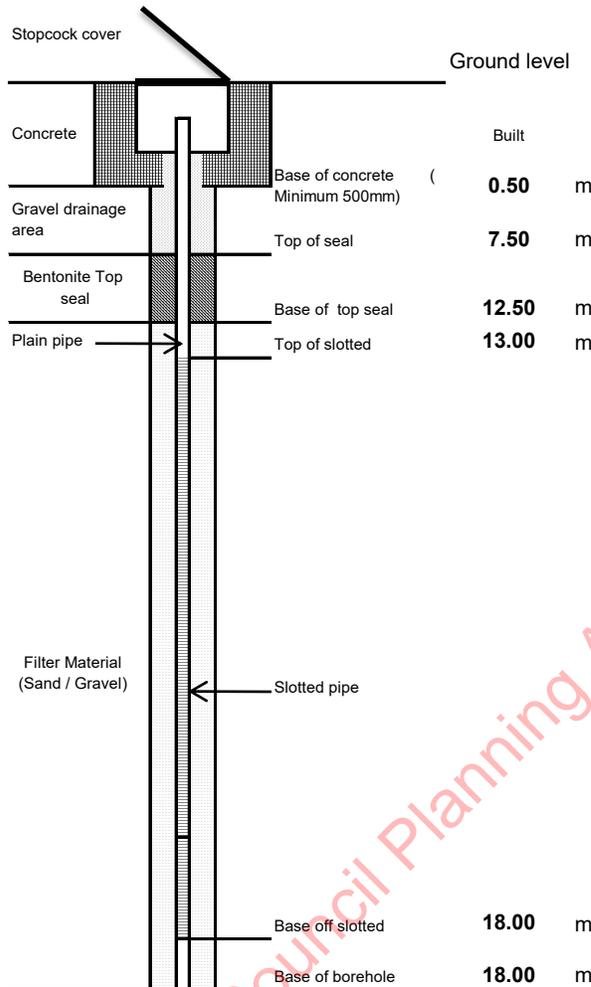
Shift details				Drilling Equipment Details												Ground Water Record								Backfill (m)			
Start time (hhmm)	Hole (m)	Water (m)	Casing (m)	Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer	Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Seated (m)	Type	From (m)	To (m)
0925				C	140.00	0.00	18.00					Sim. Casing				0930	4.50	4.50	Slow	0.00	0.00	0.00	0.00	N/S			
				RO	154.00	0.00	18.00				DTH Button Bit		115	Air	No												
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)																								
1425																											

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks	SPT I.D. Number	PD1	Calibration Date	01/02/2021	Project Title					
0925		CAT Scanned: No	SPT Rod Type	2 3/8 Regular	SPT Energy Ratio	0.00	Castlepollard Quarry					
0925		Permit Completed: Yes	Drilling Crew Details			CSCS No						
1355	0030	Dayworks: Airlift development of well	Support Operative		John Whyte		Weather	Variable		Project No	21-Dec	
			Lead Driller		Stephan Petersen		Date	19/04/2021		Day	Monday	
			Site category		Green		Rig type	Knebel HY79		Borehole Number		
			Project Engineer				Inclination	Orientation		MW 2		
			Lead Driller's signature					Sheet	1 of 1		Completed	Y



Summary of Standpipe Installation

Schematic Diagram (not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	154	mm
Slot size	0.5	mm
Geosock	No	
Gas tap	None	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	0.00	m
Time of Initial reading	1335	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	7.50	0.50
Borehole seal top	12.50	7.50
Filter zone	18.00	12.50
Plain pipe	13.00	GL
Slotted zone	18.00	13.00
Base of borehole	18.00	

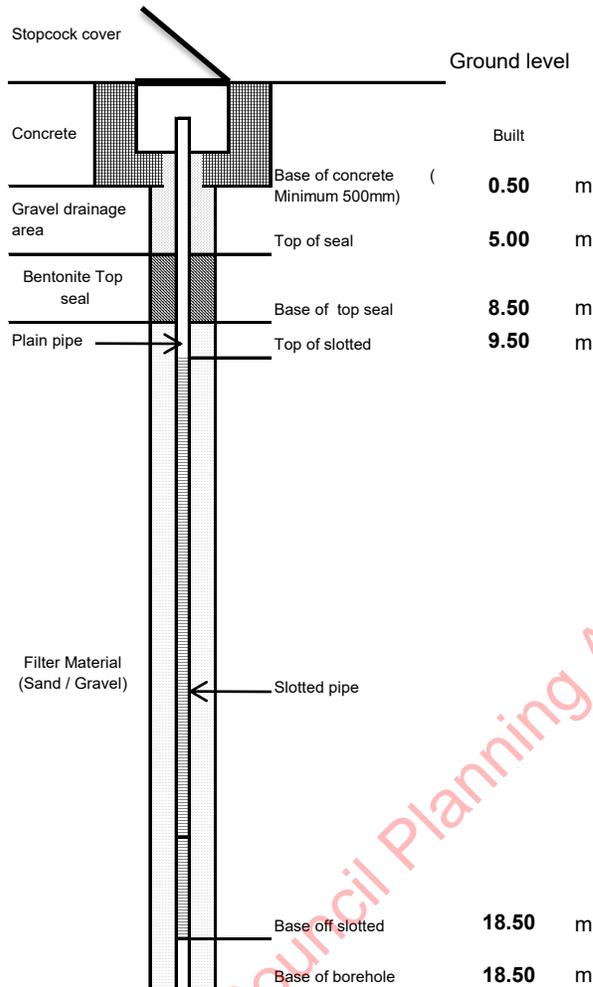
Remarks

2nd bentonite seal 5 to 3.5m

Rig type	Knebel HY79	Project Title			
Drilling Crew Details		Castlepollard Quarry			
Support Operative	John Whyte	Project No		21-Dec	
Lead Driller	Stephan Petersen	Day	Monday	Date	April 19, 2021
Site category	Green	Borehole Number			
Engineer		MW 2			
Lead Driller's signature					

Summary of Standpipe Installation

Schematic Diagram (not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	154	mm
Slot size	0.5	mm
Geosock	No	
Gas tap	None	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	-0.30	m
Time of Initial reading	0950	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	5.00	0.50
Borehole seal top	8.50	5.00
Filter zone	18.50	8.50
Plain pipe	9.50	GL
Slotted zone	18.50	9.50
Base of borehole	18.50	

Remarks

2nd bentonite seal 2 to 0.5m, waterlevel rose to 0.3m above ground over night

Rig type	Knebel HY79	Project Title			
Drilling Crew Details		Castlepollard Quarry			
Support Operative	John Whyte	Project No		21-Dec	
Lead Driller	Stephan Petersen	Day	Wednesday	Date	April 21, 2021
Site category	Green	Borehole Number			
Engineer		MW 3			
Lead Driller's signature					