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Project <u>VANDER CORE LOGGING</u>					Project No				
Described by <u>AMC JC</u>					Borehole No <u>VANDER BH 5</u>				
Date <u>20/11/2017</u> <u>CORE BOX 1-3</u>					Sheet No <u>1</u> <u>4.5mbgl → 13.3mbgl</u>				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
4.5	LST	DARK GRAY, HARD, V. FINE GRAINED LST. DOWLIAS LST UNWEATHERED	4.5	4.7	0.15m	75%	100	0	
4.7		GRAY, HARD, FINE GRAINED UNWEATHERED DOWLIAS LST	4.7	5.8	1.1m	100%	95%	6	
5.8	LST	GRAY HARD, FINE GRAINED UNWEATHERED	5.8	6.3	0.4m	80%	95%	4	
6.3	LST	GRAY, HARD, MEDIUM GRAINED LST DOWLIAS LST.	6.3	7.3	0.9	90%	85%	5	
7.3	LST	GRAY, Hard, Fine grained, LST, Fossiliferous - 6cm, Unweathered, Dowlias.	7.3	8.8	1.5m	100%	100%	6	
8.8	LST	Dark grey, hard, fine, unweathered, dow lias fossils ~ 2cm, clay infilled joints.	8.8	10.3	1.5m	100%	95%	7	
10.3	LST	Dark grey, hard, fine, unweathered, Fossiliferous, bivalves + molluscs, unweathered, Dowlias.	10.3	11.8	1.5m	100%	92%	5	
11.8	LST	Dark grey, hard, fine, unweathered, Fossiliferous, Calcite Veining, clay infilled joints; Fossiliferous. Dowlias	11.8	13.3	1.5m	100%	95%	6	
Samples taken / tests performed					Remarks				

Project Vaynor core logging			Project No						
Described by AMC JC			Borehole No Vaynor BHS						
Date 20/11/2017 Core box 4-6			Sheet No 2 13.3 mbgl - 22mbgl						
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
13.3	LST	Dark grey, hard, v. fine lstr. Dawlairs, fossiliferous. Disseminated core between some fractures. Highly ^{Medium} weathered, rusty, muddy infilling.	13.3	14.7	1.3	95%	65%	12	
14.7	LST	Dark grey, hard, v. fine lstr. Dawlairs, fossils, veining. Slight weathering muddy infilled fractures.	14.7	16.1	1.4	100%	91%	8	
16.1	LST	Dark grey, hard, v. fine lstr. Dawlairs ^{Medium} weathered in fractures. Vertical long fractures infilled w/ rusty mud.	16.1	17.5	1.4	100%	82%	10	
17.5	LST	Dark grey, hard, v. fine lstr. Dawlairs un weathered - slight slight clay infilling in fractures	17.5	19.0	1.45	96%	100%	4	
19.0	LST	Dark grey, hard, v. fine lstr. Dawlairs Unweathered fossiliferous.	19.0	20.5	1.4	93%	95%	6	
20.5	LST	Dark grey, hard, v. fine lstr. Dawlairs Unweathered fossiliferous. Vertical fracture - mud infilling at base.	20.5	22	1.45	96%	91%	8	
Samples taken / tests performed			Remarks						

Project <u>Vayner core logging</u>				Project No				
Described by <u>JC AMC ALL</u>				Borehole No <u>Vayner BHS</u>				
Date <u>20/11/2017</u> <u>core box 7-9</u>				Sheet No <u>3</u> <u>22 mbgl-30-4.</u>				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
22	 LST	Dark grey, hard v. fine Dawlais fossiliferous Unweathered calcite veins some clay in joints	22	23.5	1.42	95%	91%	7.5
23.5	 LST		23.5	24.8	1.3	100%	100%	5
24.8	 LST		24.8	26	1.2	100%	85%	6
26	 LST	Dark grey, hard, v. fine Dawlais fossiliferous Medium weathering - clay infills, pale calcareous muds. calcite veining	26	27.5	1.5	100%	82%	13
27.5	 LST	Dark grey, hard v. fine Dawlais veining clay infills in fractures - lime mud. slight weathering	27.5	29	1.5	100%	95%	7
29	 LST	Dark grey, hard, v. fine. Dawlais Dark brown mud/clay & weathered layer at top slight weathering.	29	30.4	1.3	93%	88%	6.
Samples taken / tests performed			Remarks					

Project <u>Vaynor core logging</u>				Project No				
Described by <u>J C AMC ALL</u>				Borehole No <u>Vaynor B45</u>				
Date <u>20/11/2017</u> <u>core box 10-13</u>				Sheet No <u>4</u> <u>30.4 mbgl - 338.9</u>				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
30.4	 LST	Dark grey, hard, v. fine Dowlais fossiliferous Unweathered some clay infilled fractures	30.4	31.9	1.5	100%	95%	7
31.9	 LST	" Plastic casing partially destroyed v. dark mud infilling joints	31.9	32.5	0.6	100%	83%	5
32.5	 LST	Dark grey, hard, v. fine Dowlais fossiliferous Unweathered	32.5	34	1.45	97%	97%	6
34	 LST	"	34	35.4	1.4	100%	100%	3
35.4	 LST	"	35.4	36.4	1.0	99%	100%	1
36.4	 LST	"	36.4	37.4	1.0	100%	90%	6
37.4	 LST	Top 35 cm Pulverised → average 2-4 cm pieces - Flat + angular Dark, hard, v. fine Lst. Dowlais fossils v. dark mud infills highly weathered	37.4	38.9	1.4	93%	71%	20
Samples taken / tests performed			Remarks					

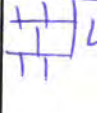
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Project <u>Vaynar core logging</u>				Project No					
Described by <u>JC AMC ALL</u>				Borehole No <u>Vaynar BHS</u>					
Date <u>20/11/2017</u> <u>core box 14-17</u>				Sheet No <u>5</u> <u>38.9 - 50.5 m bgl</u>					
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
38.9	 LST	Dark grey, hard, v. fine DOWLAIS Fossiliferous Unweathered.	38.9	40.2	1.25	96%	100%	3	
40.2	 LST	v. dark mud in fractures.	40.2	41.7	1.5	100%	99%	3	
41.7	 LST	"	41.7	43.2	1.38	90%	99%	1	
43.2	 LST	No fractures, solid core.	43.2	44.6	1.32	94%	100%	0	
44.6	 LST	Dark grey, hard, v. fine DOWLAIS Fossiliferous Unweathered Dark clay infilled fractures.	44.6	46.1	1.5	100%	100%	2	
46.1	 LST	"	46.1	47.6	1.5	100%	100%	2	
47.6	 LST	"	47.6	49.1	1.43	95%	97%	3	
49.1	 LST	Dark grey, hard, v. fine DOWLAIS Lg ~15cm calcite crystal Fractures infilled w/ mud + crumbled LST.	49.1	50.5	1.35	96%	96%	4.	
Samples taken / tests performed			Remarks						

Project <u>Vaynor core logging</u>			Project No						
Described by <u>JC AMC ALL</u>			Borehole No <u>Vaynor BHS</u>						
Date <u>20/11/2017</u> <u>Core 18-19.</u>			Sheet No <u>6</u> <u>50-5-56.4 m bgl</u>						
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
50.5		LST Dark grey lsr, hard, v. fine DOWLAIS unweathered some vertical fractures along calcite veins thin (~2cm) layer of fragmented lsr pieces (abundant) (~1cm) + dark mud	50.5	52	1.5	100%	98%	7	
52		LST Dark grey lsr, hard, v. fine DOWLAIS unweathered vertical calcite veins 1cm thick	52	53.5	1.42	95%	96%	3	
53.5		LST Dark grey lsr, hard, v. fine DOWLAIS unweathered lg calcite veins 3cm thick	53.5	54.9	1.4	100%	100%	7	
54.9		LST mud filled fractures.	54.9	56.4	1.4	93%	94%	6	
Samples taken / tests performed			Remarks						

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Project <u>Vaynor core logging</u>				Project No				
Described by <u>JC AMC ALL</u>				Borehole No <u>VAYNOR BHS</u>				
Date <u>21/11/2017</u> <u>Box 20-21</u>				Sheet No <u>7</u> <u>56.4-63.1</u>				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
56.4	 LST	Dark grey, hard, v. fine Dowlais. unweathered 1-2cm thick calcite veins Base 6cm bituminous/dark ↳ oily smell.	56.4	57.8	1.4	100%	96%	6
57.8	 LST	Dark grey, hard, v. fine. Dowlais Friable shale interbeds oil smell bituminous	57.8	58.6	0.8	100%	100%	3
58.6	 LST	Grey-light, hard, v. fine top soft clayey Basal Dowlais transitional zone Top 8cm med. weathered, rest unweathered.	58.6	59.3	0.7	100%	93%	5
59.3	 LST	light grey Lst, Highly weathered hard in centre, clayey + friable at top + base. Large amount of material lost, likely clays lost ↳ Gilwern clay.	59.3	60.7	0.56	40%	55%	>20
60.7	 clay	light grey/yellow clay, dirty unconsolidated, fragments of gravel ~1cm, sandy-gritty Highly weathered, carbonaceous Gilwern clay ~80cm clay lost	60.7	61.5	0.08	10%	N/A	NA
61.5	 LST	light grey Lst, highly weathered hard. Top of Hanelly	61.5	61.7	0.1	50%	0%	7
61.7	 LST	light grey Lst with silty sandy clay coatings Lst hard Highly weathered + fragmented pieces pebbles 5mm-3cm. Hanelly.	61.7	63.1	1.0	71%	25%	>20
Samples taken / tests performed				Remarks				

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Project <u>Vaynor core logging</u>			Project No						
Described by <u>JC AMC ALL</u>			Borehole No <u>VAYNOR BHS</u>						
Date <u>21/11/2017</u>			Box <u>22-24</u>		Sheet No <u>8</u>		63-1 - 72-1		
Depth m	Lithology	Description Detail	Core Run		TCR m	% Core Recovery	RQD m	FI	
			From	To					
63.1	LST	Light grey lsr, silty sandy clay coating Lsr hard. Highly weathered + fragmented Pebbles ~ 3cm	63.1	63.8	0.3	43%	0%	>20	
63.8	LST	Light grey lsr, rusty weathering Joints highly weathered Calcite infills up to 20cm. → voids visible. Hard lsr. Barely fm	63.8	64.6	0.8	100%	100%	3	
64.6	LST	" Barely fm 15cm in centre highly fractured + fragmented rusty sand around fragments.	64.6	66.1	1.4	93%	84%	8	
66.1	LST	Light grey lsr, ~3cm calcite Joints highly weathered 11cm of shale interbeds in core, gravels 1-30mm clayey in interbeds Barely fm. 3cm calcite veins	66.1	67.6	1.4	96%	92%	67	
67.6	LST	Light grey - darker at bottom of core. Joints infilled w/ clay Medium weathering in fractures Barely fm. 2cm calcite veins	67.6	69.1	1.4	97%	77%	14	
69.1	LSR	Medium grey, hard lsr. sm calcite crystals up to 3mm 3cm shale interbed unweathered.	69.1	70.6	1.45	97%	81%	8	
70.6	LST	" U-shaped calcite veins. no shale interbeds 3cm clay silty at top of BH - possibly put there by drill / scraped on during drilling	70.6	72.1	1.5	100%	95%	6	
Samples taken / tests performed			Remarks						

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Project <u>Vaynor core logging</u>				Project No				
Described by <u>JC AMC ALL</u>				Borehole No <u>VAYNOR BHS</u>				
Date <u>21/11/17</u> <u>Box 25-26</u>				Sheet No <u>9</u> <u>72-1-77-8</u> mb				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
72.1	 LST	Dark grey, fine Lst, hard. u-shaped calcite veins + horizontal veins Areas of high concentration of calcite grains / smt fossils ~2mm. Unweathered	72.1	73.3	1.2	100%	96%	3.
73.3	 LST	med/dark grey, fine, hard u-shaped veins shale interbeds ~3cm wide unweathered calcite grains / smt fossils ~2mm throughout.	73.3	74	0.7	100%	83%	5
74	 LST  MUD	light grey Lst - ^{med} hard, fine highly weathered, friable. transitions down into grey/green mud. - Base of Manely? → soft.	74	74.8	0.8	100%	75%	>20
74.8	 LST  Calcarenous mud clay  LST	Grey, very fine Lst - hard No veining / structures Green clay interbeds - very friable Pale clay weathering - highly weathered - clay beds. - likely base of Manely	74.8	76.3	1.3	87%	41%	>20
76.3	 clay	Green clay / mud bed. Soft, friable, highly weathered	76.3	76.7	0.3	75%	0%	>20
76.7	 LST	Light grey / Lst - hard, v. fine Highly fractured, moderate weathering Highly weathered muddy beds + friable. Mostly consistent.	76.7	77.8	1.1	100%	0%	>20
Samples taken / tests performed				Remarks				

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Project <u>Vaynor core logging</u>				Project No				
Described by <u>JC AMC ALL</u>				Borehole No <u>VAYNOR BHS</u>				
Date <u>21/11/17</u> <u>Box 27-29.</u>				Sheet No <u>10</u> <u>77-8-857</u> mbc				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
77.8	LST	light grey, hard highly fractured slight weathering muddy, friable ~4cm wide. ↳ possibly weathered joints. Infrequent calcite veins visible 0.5mm circular oids - c ↳ Abercrombie oolite.	77.8	79.3	1.25	83%	58%	>20
79.3	LST	- ooidal - high oolite concentration throughout. - slightly less fractured than previous core.	79.3	80.8	1.45	97%	86%	7
80.8	LST	light grey, hard, thin ~4cm interbed - shale. soft, friable unweathered. oolitic. Abercrombie oolite. Evidence of possible dissolution surface.	80.8	82.3	1.45	97%	97%	7
82.3	LST		82.3	83.8	1.45	97%	100%	5.
83.8	LST	light grey, hard unweathered Abercrombie oolite. ooidal Base grades to dark grey lst. clay lense at top 15cm	83.8	85.3	1.45	97%	97%	3
85.3	LST	Dark grey/black, hard 1st unweathered, some vertical calcite veins. Highly fractured ↳ likely during drilling as casing destroyed /	85.3	85.7	0.4	100%	38%	>20
Samples taken / tests performed				Remarks				

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29.

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Project <u>Vaynor core logging</u>				Project No				
Described by <u>JC AMC ALL</u>				Borehole No <u>VAYNOR BHS</u>				
Date <u>21/11/17</u> <u>Box 30-32</u>				Sheet No <u>11</u> <u>85-7-952</u>				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
<u>85.7</u>	 <u>LST</u>	<u>Dark grey/black LST, very thin calcite veins (2mm), unweathered, No visible acids.</u>	<u>85.7</u>	<u>87.2</u>	<u>1.3</u>	<u>87%</u>	<u>90%</u>	<u>6</u>
<u>88.7</u> <u>87.2</u>	 <u>LST</u>	<u>11</u>	<u>87.2</u>	<u>88.7</u>	<u>1.42</u>	<u>97%</u>	<u>92%</u>	<u>8</u>
<u>88.7</u>	 <u>LST</u>	<u>Dark grey/black LST, very thin calcite veins (2mm), unweathered, no visible acids. crystalline - very fine possibly dolomitic.</u>	<u>88.7</u>	<u>90.2</u>	<u>1.4</u>	<u>93%</u>	<u>82%</u>	<u>6</u>
<u>90.2</u>	 <u>LST</u>	<u>11</u>	<u>90.2</u>	<u>91.6</u>	<u>1.4</u>	<u>100%</u>	<u>100%</u>	<u>9</u>
<u>91.6</u>	 <u>LST</u>	<u>vertical calcite veins core casing partially destroyed</u>	<u>91.6</u>	<u>92.2</u>	<u>0.6</u>	<u>75%</u>	<u>0%</u>	<u>720</u>
<u>92.2</u>	 <u>LST</u>	<u>Dark grey/black LST, unweathered thin calcite veins (~3mm) fine, crystalline, hard unit - end of darker LST bed</u>	<u>92.2</u>	<u>92.68</u>	<u>0.48</u>	<u>100%</u>	<u>63%</u>	<u>6</u>
<u>92.68</u>	 <u>LST</u>	<u>grey, hard, oolitic, 0.5um calcite veins unweathered. wavy, irregular contact at top of unit.</u>	<u>92.68</u>	<u>93.7</u>	<u>1.02</u>	<u>100%</u>	<u>88%</u>	<u>8</u>
<u>93.7</u>	 <u>LST</u>	<u>grey, hard, oolitic, 1cm calcite veins, highly fractured 40cm band. moderate weathering/mud mulls in fractured areas. iron oxide staining (deep red) in vertical fractures.</u>	<u>93.7</u>	<u>95.2</u>	<u>1.5</u>	<u>100%</u>	<u>74%</u>	<u>720</u>
Samples taken / tests performed				Remarks				

Project <u>Vaynor core logging</u>				Project No				
Described by <u>JC AMC ALL</u>				Borehole No <u>VAYNOR BH5</u>				
Date <u>21/11/17</u> <u>Box 33-34</u>				Sheet No <u>12</u> <u>95-2-101.2</u>				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
95.2	 LST	Blk lighter grey, hard gr. fine, oolitic (0.5mm ooids) Hf med. weathering in fractures - rusty mud 1cm calcite veins	95.2	96.7	1.5	100%	10%	>20
96.7	 LST	 unweathered.	96.7	98.2	1.5	100%	33%	>20
98.2	 LST		98.2	99.7	1.5	100%	84%	11
99.7	 LST		99.7	101.2	1.5	100%	84%	13
		END OF BOREHOLE. 101.2mbgl						
Samples taken / tests performed					Remarks			

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-Final
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Contract Name VAYNORContract No 1172Date 19/9/2017Sheet 1 of 1 Working Day 11

APEX

DRILLING SERVICES

DAILY DRILLING LOG

Tel: 01656 749149
E-mail: admin@apex-drilling.com

Client HANSONOrder No R. GriffithsDriller DIAN T Crewmen CHAI, S.Rig Type KLEMM

Bore Hole	Top Depth	Base Depth	Thickness	Recovery	Strata Description	Standing Time — Reason	INSTALLATION DETAILS		
OH	54.00	59.00	5.00		Limn.		Borehole No		
<u>BH 5A</u>	<u>0.96</u>	<u>VAYNOB05A</u>			AIR FLOW 3/4 L/S		Ground Level		
INSTA	0.00	2.00	2.00		Plan 10mm WELL CASING BENTONITE		BENTONITE 0.0 to 3.0m GRAVEL 3.0m to 59.0m		
	3.00	59.00	56.00		SLOTTED WELL SCREEN GRAVEL PACK				
					INSTALL RASING CORK				
					Drill G. Plan Holes for fencing.				
					TRACK TO BH 6 SET UP full WATER BOWSER, more GRASS, PIPEWORK ETC.	12.00-14.45			
BH 6	6.00	8.10	8.10		TILL				
	8.10	9.00	0.90		Limn.	CASING 9mm			
Curel	9.00	10.50	1.50	1.50	Limn.		Bore Depth		Materials

QUANTITIES

Site Moves No Casing m Core Boxes No Fixed Plant
 Bore Moves No Open Hole m Core Liner m
 Return Moves No W. Samples m SPT/CPT No Standing Times (hrs)
 Security YES / NO Coring m Installation m Breakdown (hrs)

Diameter Ø
 Well Casing m
 Well Screen m
 Gravel m
 Bentonite m
 Gas Bung (No)
 End Cap (No)
 Cover Type RAISED / FLUSH
 Water Level m
 Remarks

Signed
by ApexSigned
by Client

Date



Certificate No: 08750A

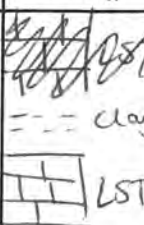
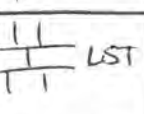
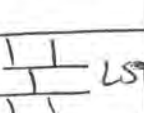
Blue - Client's Copy Yellow - QS Copy White - Site Copy

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Project VAYNOR CORE LOGGING					Project No				
Described by AMC JC ALL					Borehole No VAYNOR. B46				
Date 22/11/2017 Core box 1-3					Sheet No 1 9 - 18 mbgl				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
9	LST	Dark/medium grey, fine Rusty weathering - Mild. Hard. (scratched w/ metal) Fossiliferous: 5cm sandy lense coarse	9	10.5	1.5	100%	72%	14	
10.5	LST	Dark/medium grey fine hard Mild rusty weathering 1cm u-shaped calcite veins Fossiliferous	10.5	12	1.5	100%	64%	>20	
12	LST	Dark/med grey, fine hard Red rusty mud impills in fractures Fossiliferous Slight weathering Dowlais	12	13.5	1.5	100%	76%	>20	
13.5	LST	"	13.5	15	1.5	100%	97%	10	
15	LST	Dark grey, fine hard. Lst. Thin clay layer / interbed (possibly from drilling) Fossiliferous light weathering in fractures Dowlais - mud impills	15	16.5	1.5	100%	73%	14	
16.5	LST	Dark grey, fine, hard Fossiliferous Highly fractured + broken up pieces 5-20cm. TRC unknown due to fracturing Dowlais.	16.5	18.1	unknown		0%	>20	
Samples taken / tests performed					Remarks				

Project <u>Vaynor core logging</u>				Project No				
Described by <u>AMC JC ALL</u>				Borehole No <u>Vaynor BH 6</u>				
Date <u>22/11/17</u>		Core box <u>4 - 7</u>		Sheet No <u>2</u>		18.1-28.7 mhc		
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
18.1	LST	Dark grey, hard, fine gr. Fossiliferous light weathering Red/iron oxide mud infills Top highly fractured -	18.1	19.6	1.2	80%	80%	220
19.6	LST	Dark grey, hard, fine gr. Fossiliferous light weathering - red mud infills 3cm bed of black consolidated clay, no odor. -very dark black.	19.6	21.1	1.44	96%	96%	9
21.1	LST	Dark grey, hard, fine gr. Unweathered 0.5cm calcite veins Fossiliferous Darlais. LST	21.1	22.5	1.4	100%	96%	7
22.5	LST	11	22.5	24	1.5	100%	73%	10
24	LST	11 Some vertical fracturing at top. infilled w/ red/brown clay	24	26	2.0	100%	100%	14
26	LST	Dark grey/black, hard, fine gr., slight weathering - muddy infilled fractures Fossiliferous, thin 2mm calcite veins.	26	28.7	2.7	100%	89%	12
Samples taken / tests performed			Remarks					

Project Vaynor core logging			Project No						
Described by AMC JTC ALL			Borehole No Vaynor BH6						
Date 22/11/17 Core box 8-10			Sheet No 3 28.7 - 38 m bgl						
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
28.7	LST	Dark grey, hard, fine LST Fossiliferous Dawlars unweathered LST.	28.7	30.2	1.44	96%	95%	4	
30.2	LST	black clay infills in fractures	30.2	31.6	1.4	100%	100%	3	
31.6	LST	Dark grey, hard, fine LST. Fossiliferous vertical + unweathered, horizontal Dawlars LST. calcite veins	31.6	33	1.4	100%	100%	4	
33	LST		33	34.5	1.4	93%	100%	5	
34.5	LST	3cm thick calcite veins	34.5	36	1.44	96%	90%	7	
36	LST	Mostly dark grey fossiliferous hard limestone - dawlaris. - Dark clay-filled fractures. Base light grey/green clay likely majority of loss from clay component. Unknown FI due to clays.	36	36.9	0.35	39%	69%	~10	
36.9	LST --- Clay	Medium-dark grey LST, hard, fossiliferous Rock appears brecciated + relithified w/ calcite cement. 8cm bed of friable laminated LST shale. 3cm. Base - soft malleable green clay - likely lost material.	36.9	38	0.8	72%	70%	7	
Samples taken / tests performed Moderate weathering in joints.			Remarks						

Project Vaynor core logging					Project No				
Described by AMC JC ALL					Borehole No Vaynor BHH6				
Date 22/11/17 Core box 11-13					Sheet No 4 38-46.8 magl				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
Box 11 38		Top 15cm green grey clay ↳ lost material is likely clay. ↳ Gilwern clay light green grey mottled lost hard, fine, calcite veining + recrystallisation. Pressure solution surfaces - likely Harely fm. unweathered	38	39.5	1.27	85%	69%	14	
		light green grey, hard, fine, mottled ↳ Harely fm. this lost. is very competent, it is likely that the lost material is from the green clay above. unweathered.	39.5	41	1.1	73%	73%	15	
Box 12 41		Light green grey, fine, hard Pressure solution surfaces visible - jagged black horizontal unweathered lines. u-shaped Harely fm. calcite veins.	41	42.3	1.3	100%	88%	11	
		" "	42.3	43.8	1.5	100%	100%	4	
Box 13 43.8		" " light grey - silty sand mfill in fracture	43.8	45.3	1.5	100%	95%	67	
		" "	45.3	46.3	1.25	97%	85%	6	
Samples taken / tests performed					Remarks				

Project <u>Vaynor borehole logging</u>				Project No					
Described by <u>AMC JC ALL</u>				Borehole No <u>Vaynor BHB</u>					
Date <u>22/11/17</u> <u>Core box 14-17</u>				Sheet No <u>5</u> <u>46-8-58.4 mbc</u>					
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
BOX 14 46.8	LST	15cm green clay + limestone gravel at top	46.8	48	1.2	100%	88%	7	
		Lst. Light grey, hard, horizontal calcite veins (0.5cm thick) unweathered, fine blarely fm.							
48	LST	Light grey/green, hard, v. fine LST. U-shaped calcite veins (0.5cm thick) slight weathering (red staining) in some fractures	48	49.5	1.5	100%	95%	10	
BOX 15 49.5	LST	Light grey, hard, v. fine LST. 0.5cm calcite veins - u-shaped unweathered blarely fm. Pressure solution structures	49.5	51	1.5	100%	80%	10	
		"	51	52.5	1.5	97%	94%	8	
BOX 16 52.5	LST	Light grey/green, hard, fine crystalline 3mm, good cleavage, scratch w/ metal. unweathered, pressure solution structures blarely fm.	52.5 52.5	55.4 55.4	3.2 2.9	100%	84%	19	
		"	55.4	56.9	1.5	100%	94%	9	
BOX 17 56.9	LST	"	56.9	58.4	1.4 1.44	96%	100%	7	
Samples taken / tests performed					Remarks				

Project <u>Vaynor borehole logging</u>			Project No							
Described by <u>AMC JC ALL</u>			Borehole No <u>VAY BH 6</u>							
Date <u>22/11/17</u> <u>core box 18-19</u>			Sheet No <u>6</u> <u>58.4 - 64.4 m</u> <u>gi</u>							
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI		
	Lithology	Detail	From	To						
BOX 18 58.4		Top 90cm: light grey, hard, fine unweathered lsr. <u>slightly fm. - Base?</u> Bottom 60cm: Dark grey, hard, fine lsr. unweathered. Boundary is gradational over 10cm.	58.4	59.9	1.5	100%	90%	8		
59.9		Dark grey/black, fine, hard unweathered. 1.3m shale / friable bed, dark black + muddy.	59.9	61.4	1.5	100%	83%	12		
61.4		Dark grey/black, hard, v. fine, unweathered lsr. fine ~3mm calcite veins	61.4	62.9	1.5	100%	100%	4		
BOX 19 62.9		Top 60cm - same as above core Middle 58cm - - light grey, hard, ooid ooidal - ooid dense (0.5mm) - Unweathered. - Voids w/ crystals of calcite growing in (3mm) (Abbecriban ooid?) End 32cm - back to dark grey/black, non ooidal, seen previously in box 18.	62.9	64.4	1.5	100%	88%	11		
		Transitional / gradational boundaries either side of ooid section (middle).								
Samples taken / tests performed			Remarks							

Project Vaynor borehole logging				Project No				
Described by AMC JC ALL				Borehole No VAY BH6				
Date 22/11/17 Core box 20-23				Sheet No 7 64.4-75.6 mlog				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
BOX 20 64.4	LST	Dark black/grey lsr, hard, slight weath Fine slight weathering in fractures → black mud present.	64.4	65.8	1.35	99%	89%	6
		"	65.8	67.3	1.48	99%	100%	7
BOX 21 67.3	LST	"	67.3	68.3	1.0	100%	63%	15
		Top - dark black/grey lsr (hard + fine) very gradational boundary down into grey, oddal lsr (hard) at base (0.5mm) All unweathered.	68.3	69.8	1.48	95%	100%	5
BOX 22 69.8	LST	Dark grey/black lsr, hard, fine, for top 20cm fossiliferous 2cm laminated gravelly interbeds - artefact of winning/faulting? unweathered	69.8	71.3	1.47	99%	88%	11
		Dark grey/black lsr, hard, fine unweathered. unfossiliferous.	71.3	72.7 72.7	1.4 1.4	100% 100%	100%	7
BOX 23 72.7	LST	"	72.7	74.1	1.4	100%	84%	8
		" Some 2cm bands of paler mottled lsr.	74.1	75.6	1.46	97%	95%	4
Samples taken / tests performed					Remarks			

Project <u>Vayner borehole</u>				Project No				
Described by <u>AME JC ALL</u>				Borehole No <u>VAY BH6</u>				
Date <u>22/11/17</u> Core box <u>24-</u>				Sheet No <u>8</u> <u>75-6</u>				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
Box 24 75.6	LST	Dark grey/black lgr, hard, v. fine, black mud in fractures splits/breaks. unweathered. perfectly horizontally not fossiliferous. -shale-like	75.6	77.1	1.45	97%	59%	3
			77.1	78.6	1.4	93%	48%	5
Box 25 78.6	LST	Dark grey/black 8cm black clay bed at top Hard, fine lgr, faults milled w/ black mud. Drillers breaks are perfectly horizontal.	78.6	79.9	1.3	100%	68%	3
			END OF BH 79.9 M.					
Samples taken / tests performed				Remarks				

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Sheet of Working Day 55

APEX
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E-mail: admin@apex-drilling.com

Client TRANSOL

Order No.

Driller UFA 10.1. Crewmen POK 1.1.

Rig Type WELLS

[illegible]

QUANTITIES	Site Moves.....No	Casing.....m	Core Boxes.....No	Fixed Plant.....	Gravel.....m
	Bore Moves.....No	Open Hole.....m	Core Liner.....m		Bentonite.....m
	Return Moves.....No	W. Samples.....m	SPT/CPT.....No	Standing Times.....(hrs)	Gas Bung.....(No)
	Security YES / NO	Coring.....m	Installation.....m	Breakdown.....(hrs)	End Cap.....(No)

Signed by Apex Signed by Client

Date

Cover Type RAISED / FLUSH
Water Level.....m
Remarks

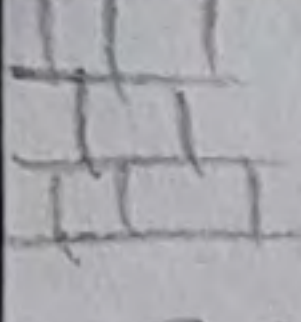
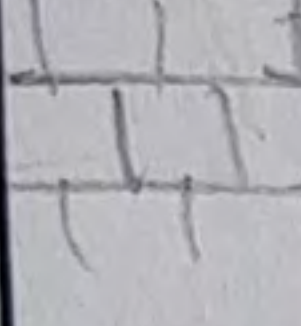
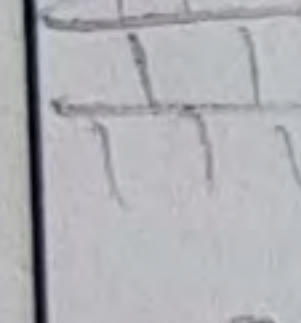
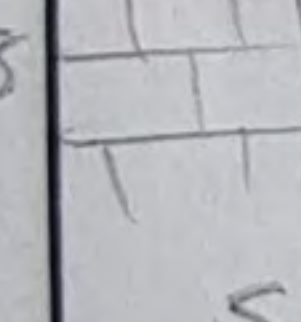
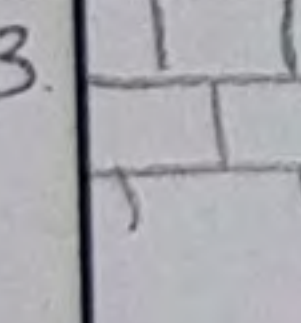
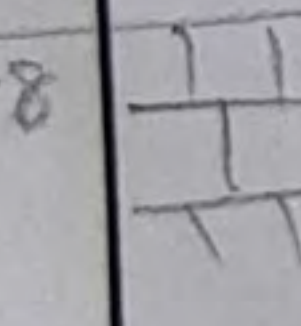
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Project <u>Vaynar Core Logging</u>			Project No					
Described by			Borehole No <u>Vaynar B# 7</u>					
Date <u>26/3/18</u> <u>Box 1-3</u>			Sheet No <u>1</u> <u>106m-19.4m</u>					
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
10.6	LSr	Dark blue/gray, Hard, v. fine Fossiliferous <u>Darlais</u> ↳ bivalves/shell frags. unweathered	10.6	12.1	1.4	93	89%	7
12.1	LSr	Dark blue/gray, hard <u>Darlais</u> fine/med. grained ↳ rounded grains visible - possibly ooids. Vertical calcite-filled fractures/veins sa light weathering	12.1	13.5	1.25	89	100%	8
13.5	LSr	Dark blue/gray, hard <u>Darlais</u> v. fine grained 8cm band of mabe, ↳ foriated muddy material at top. unweathered	13.5	15.0	1.45	97	90%	7
15	LSr	Dark blue/gray, hard v. fine grained Fossiliferous - bivalves Unweathered. <u>Darlais</u>	15	16.4	1.4	100	97%	6
16.4	LSr	Dark blue/gray, hard v. fine grained Fossiliferous unweathered centre 1-1m rich in ooids (no 5mm) <u>Darlais</u>	16.4	17.9	1.5	100	100%	2
17.9	LSr	Dark blue/gray, hard, v. fine, unweathered <u>Darlais</u> LSr.	17.9	19.4	1.45	97	93	5
Samples taken / tests performed			Remarks					

Box 1

Box 2

Box 3

Project <u>Vayner Core Logging</u>				Project No				
Described by <u>AMC ALL</u>				Borehole No <u>VAY BH7</u>				
Date <u>20/3/18</u> <u>Box 4 - 6</u>				Sheet No <u>2</u> <u>19.6m - 28.3</u>				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
19.4	 LST 58	Dark blue/grey, hard v. fine grained <u>Darlas</u> Base 50cm, surface of BH covered in 1mm hard rusted grains angular minor weathering	19.4	20.8	1.4	100	100%	4
20.8	 LST 59	Dark blue/grey, hard medium grained, <u>some</u> ooids throughout <u>rounded</u> unweathered	20.8	22.3	1.45	97	100%	3
22.3	 LST 510	Dark blue/grey, hard v. fine grained <u>Darlas</u> Fossiliferous unweathered 3cm friable shaley interbed at 70cm.	22.3	23.8	1.5	100	98	5
23.8	 LST 511	Dark blue/grey, hard <u>Darlas</u> v. fine unweathered 2 10cm ooid + fossil-rich bands at top 1 8cm band of brown rock at 25cm from base.	23.8	25.3	1.5	100%	100%	5
25.3	 LST 512	Blue/grey, hard v. fine grained, unweathered Fossiliferous + ooid rich throughout Diagonal quartz veins	25.3	26.8	1.5	100%	91%	9
26.8	 LST 513	Blue/grey, hard unweathered v. fine grained Top 1m fossiliferous + ooid rich 2cm 2 small bands of friable shaley material	26.8	28.3	1.5	100%	97%	6
Samples taken / tests performed				Remarks				

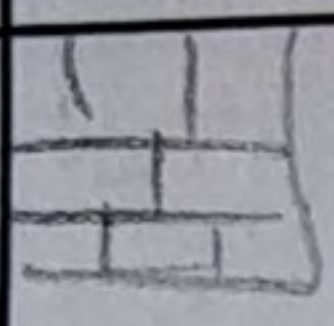
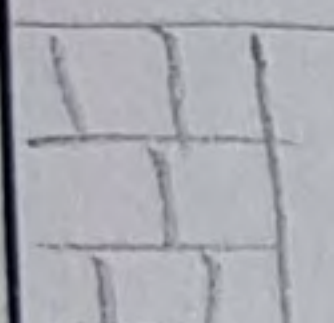
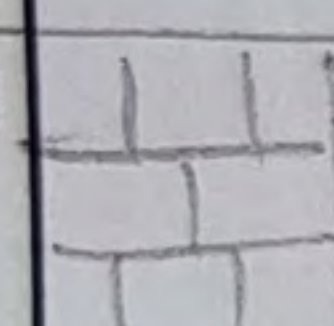
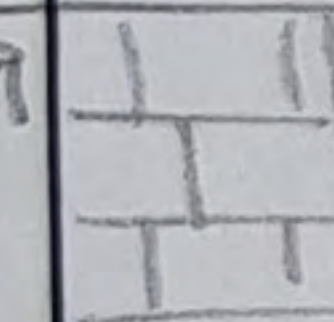
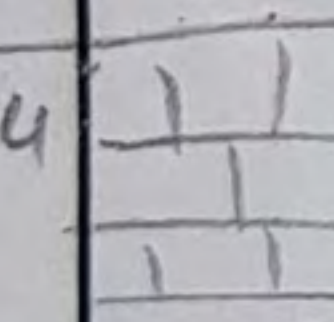
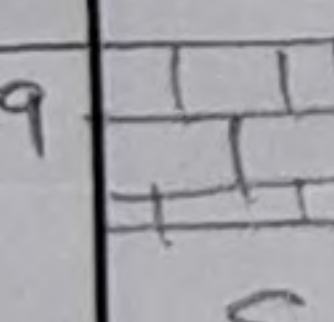
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Box 5

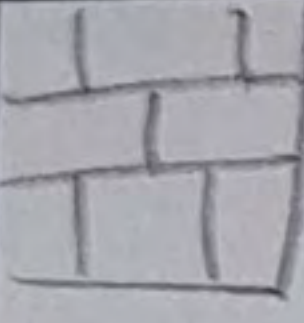
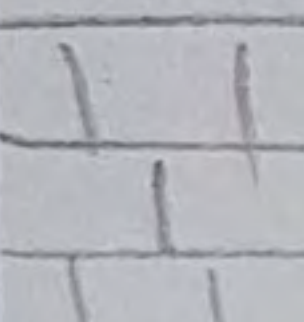
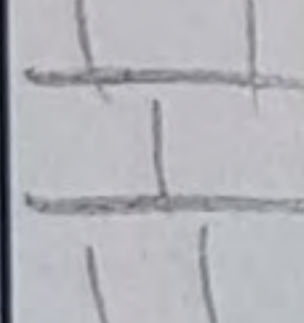
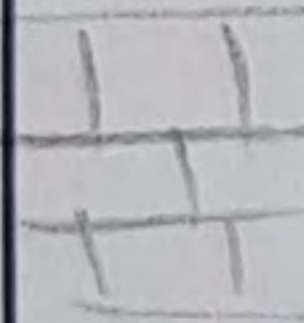
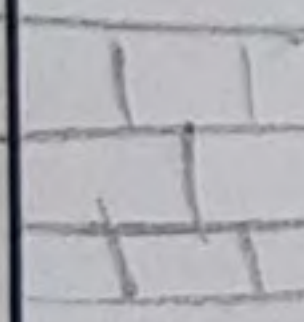
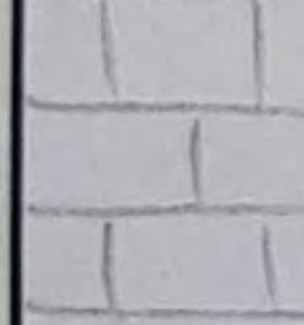
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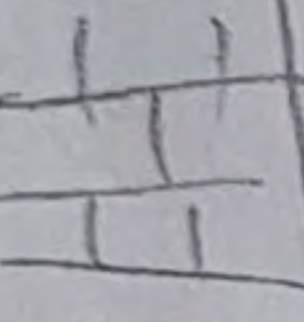
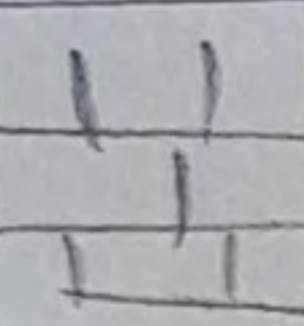
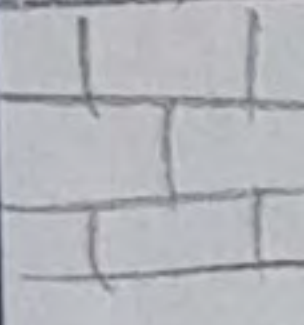
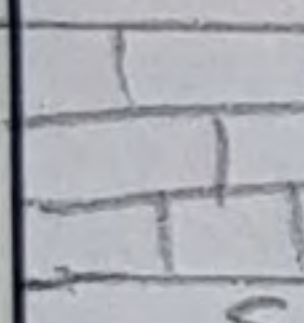
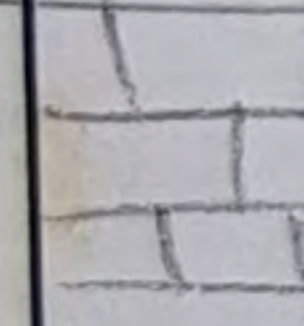
Project Vaynor borehole logging					Project No				
Described by AMC ALL					Borehole No VAY BH 7				
Date 26/3/18 Box 7- 9					Sheet No 3 28.3m - 37.15m				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
28.3	LST S14	Top 90cm - Dark grey/blue v. fine, fossiliferous <u>Dalmanites</u> 10cm shaly micaceous band in centre. <u>unweathered</u> Base 60cm - light grey/green weathered in fractures. hard, v. fine	28.3	29.8	1.5m	100	87%	8	
29.8	LST S15	Light grey/green ltr fractures filled with light green mud v. fine, hard. Some fractures may weathering. Highly fractured ltr, easy to break. Green clay nodules in base.	29.8	31.3	1.5	100%	13%	>20	
31.3	LST S16	Light grey, hard, v. fine mottled appearance old fractures filled with green mudstone. weathered.	31.3	32.8	1.5	100	100%	8	
32.8	LST S17		32.8	34.3	1.3	87	77%	15	
34.3	LST S18	Light grey ltr, hard, v. fine to diagonal calcite veins unweathered.	34.3	35.8	1.35	100	100%	6	
35.85	LST S19	 Sphalerite present.	35.85	37.15	1.5	100	90%	6	
Samples taken / tests performed					Remarks				

Project <u>Vaynor BH Logging</u>					Project No				
Described by					Borehole No <u>VAY BH7</u>				
Date <u>26/3/18</u> <u>Box 10-12</u>					Sheet No <u>4</u> <u>37-15-40</u>				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
BOX 10 37.15	LST S20	Grey, hard, fine grained unweathered calcite veins 1mm thick	37.15	38.65	1.5	100%	100%	3	
	LST S21	11	38.65	40.0	1.35	100%	81%	10	
BOX 11 40.0	LST S22	Dark grey, hard, v. fine slight may weathering in fractures fine calcite veining 5-10cm bands of crushed fossiliferous material.	40.0	41.5	1.45	97%	92%	7	
	LST S23	11	41.5	43	1.5	100%	100%	5	
BOX 12 43	LST S24	Grey/light grey hard, v. fine unweathered. Base 25cm is 0.5cm LST fragments in str. mud. Base 40cm significantly lighter	43	44.5	1.4	93%	82%	>20 (most in base 25cm)	
	LST S25	Light grey, hard, v. fine weathered base 50cm. Fresh surface sparkles, some dolomite crystals visible. Ooids visible in bottom 50cm.	44.5	46	1.45	97%	34%	>20	
Samples taken / tests performed					Remarks				

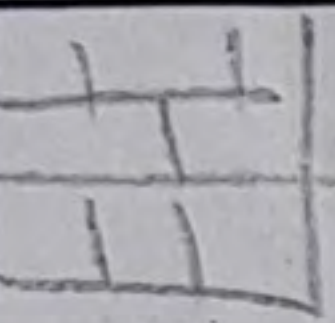
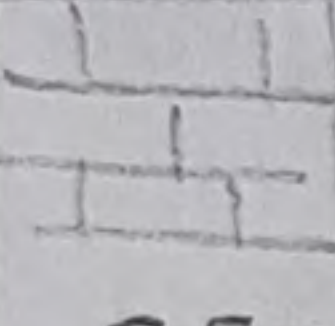
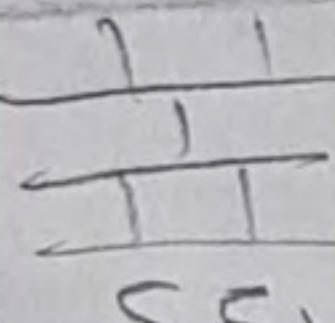
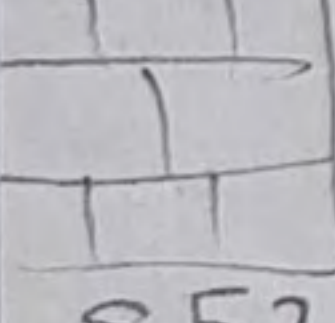
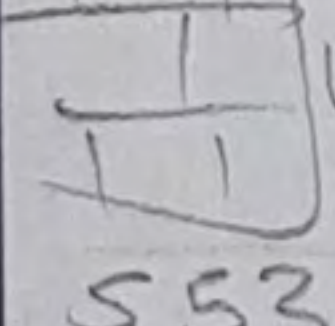
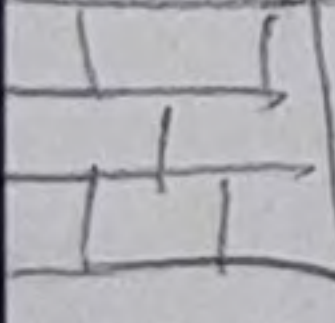
Project Vaynor BH logging			Project No						
Described by			Borehole No VAY BH7						
Date 26/3/18 Box 13-15			Sheet No 5 46m - 54.3						
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
46	 LST S25	light grey, hard, v. fine highly fractured green mud infill in some fractures some weathering in fractures	46	47.5	1.4	93%	16%	20	
47.5	 LST S26	Very light grey, hard, v. fine light weathering casing destroyed	47.5	48.4	0.8	89%	75%	4	
48.4	 LST S27	Very light grey, hard, v. fine green clay infilling in fractures mottled light + v light grey pressure solution surfaces present.	48.4	49.9	1.5	100%	100%	7	
49.9	 LST S28	V light grey lst interbedded with limestone boulders in green + purple mud/clay. All lst hard + fine Base 50cm all lst. medium weathering (possibly gilwern clay?)	49.9	51.4	1.5	100%	46%	20	
51.4	 LST S29	light grey, hard, v. fine mottled appearance slight weathering in fractures fresh surface - visible dolomite crystals	51.4	52.9	1.5	100%	100%	4	
52.9	 LST S30	light grey, hard, v. fine mottled, some 3mm green mud bands. unweathered	52.9	54.3	1.4	100%	91%	11	
Samples taken / tests performed			Remarks						

BOX
13BOX
14.BOX
15

Project Vayner BH logging				Project No				
Described by AMC ALL				Borehole No VAY BH7				
Date 26/3/18 Box 16-18				Sheet No 6 54.3m-63.1				
Depth m	Lithology	Description Detail	Core Run		TCR m	% Core Recovery	RQD m	FI
			From	To				
54.3	 LST S31	Light grey lstr, v. fine, hard light weathering in fractures pressure solution surfaces every ~10cm. 3cm Grey/green mudstone bed 40cm from top	54.3	55.8	1.45	97	79%	12
55.8	 LST S32	Light grey lstr, v. fine, hard unweathered. Pressure solution surfaces every ~20cm. 1mm dolomite crystals visible on fresh surface	55.8	57.3	1.4	93	94%	7
57.3	 LST S33	Light grey lstr, hard, v. fine unweathered shydites every ~30cm Fossiliferous 1mm dolomite crystals visible	57.3	58.8	1.5	100%	93%	5
58.8	 LST S34	Light grey lstr, hard, v. fine Rusty weathering in fractures	58.8	60.3	1.45	97%	72%	10
60.3	 LST S35	Light grey lstr, hard, v. fine Minimal weathering in fractures 1mm dolomite crystals Fossiliferous. Some vertical fracturing	60.3	61.7	1.4	100%	68%	16
61.7	 LST S36	Top 10cm mobby, muddy layer, lstr fragments ~2cm wide	61.7	63.1	1.4	100%	93%	7
Samples taken / tests performed				Remarks				

Project Vayner Core Logging				Project No				
Described by AMC ALL				Borehole No VAY BH 7				
Date 26/3/18 Box 19-21				Sheet No 7 63.1m - 72.1m				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
63.1	 LST S37	Light grey LST, hard, v. fine visible dolomite crystals (1-2mm) Vertical fracturing Vertical 2mm calcite veins Weathered in fractures.	63.1	64.6	1.5	100%	87%	12
64.6	 LST S38		64.6	67.1	1.5	100%	89%	14.
66.1	 LST S39	light grey LST, hard, v. fine visible dolomite crystals (1-2mm) Fossiliferous pressure solution surfaces every 1.5 cm unweathered.	66.1	67.6	1.5	100%	93%	9
67.6	 LST S40		67.6	69.1	1.5	100%	88%	10
69.1	 LST S41		69.1	70.6	1.5	100%	100%	6
		Top 40cm transition from light grey → grey. Grey LST, hard, v. fine, fine calcite veining unweathered	70.6	72.1	1.5	100%	87%	12
Samples taken / tests performed				Remarks				

Project Vaynar BH logging					Project No				
Described by AMC ALL					Borehole No VAX BH 7				
Date 27/3/18 Box 22-25					Sheet No 72.1m - 83.9				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI	
	Lithology	Detail	From	To					
72.1	LST S43	Dark grey, hard, v. fine unweathered Base 40 cm - 3 beds of friable slaty limestone unweathered.	72.1	73.6	1.45	97%	87%	11	
73.6	LST S45	Dark grey, hard, v. fine unweathered.	73.6	75.1	1.4	93	72%	14	
75.1	LST S46	fossiliferous	75.1	76.5	1.4	100%	100%	7	
76.5	LST S47		76.5	77.9	1.4	100	100%	6	
77.9	LST S48		77.9	79.4	1.5	100	93%	5	
79.4	LST S48		79.4	80.9	1.5	100	79%	13	
80.9	LST S49	Dark grey, hard, medium grained (grains are rounded) Unweathered, fossiliferous 10cm friable band in centre	80.9	82.4	1.5	100	95%	9	
82.4	LST S50	Dark grey, hard, medium grained (grains are rounded) unweathered, fossiliferous	82.4	83.9	1.5	100	100%	4	
Samples taken / tests performed					Remarks				

Project Vayner BH logging				Project No				
Described by ALL AMC				Borehole No VAY BH 7				
Date 27/3/18 BOX 26-				Sheet No 9 83.9-				
Depth m	Description		Core Run		TCR m	% Core Recovery	RQD m	FI
	Lithology	Detail	From	To				
83.9 BOX 26	 LS1 S50	Dark grey ls, hard, medium grained - rounded fossiliferous 20cm fossil-rich band at base unweathered.	83.9	85.4	1.5	100%	93%	9
85.4	 LS1 S50	Dark grey ls, hard med. grained - rounded grains fossiliferous 10cm fossil-rich band in centre unweathered	85.4	86.9	1.5	100%	93%	11
86.9 BOX 27	 LS1 S51	Dark grey ls, hard, med grained (rounded grains) 5-10cm bands of fossil-dense rock throughout unweathered.	86.9	88.0	0.9	82%	63%	8
88.0	 LS1 S52	11 At base 30cm from base, 3 2cm bands of bubbly muddy ls	88.0	89.5	1.5	100%	73%	1.9
89.5 BOX 28	 LS1 S53	Grey, hard, med grained (rounded grains) fossiliferous, 3 10cm fossil dense bands. 2 5cm slaty muddy beds. unweathered	89.5	91.0	1.5	100	22	14
91.0	 LS1 S54	Grey, hard, med-grained (rounded grains) fossiliferous, 2 10cm fossil dense bands - top + bottom 2 10cm slaty muddy beds unweathered.	91.0	92.5	1.5	100	25	15
		END OF BH 92.5m.						
Samples taken / tests performed				Remarks				





Certificate No: 08750A