STERLING RESOURCES (UK) LTD

WELL: 210/29c-5 Cladhan

EXPLORATION

FINAL WELLSITE GEOLOGICAL REPORT

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April 2012

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APPROVED BY
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1. INTRODUCTION

The Cladhan 210/29c-5 well was planned as a deviated exploration well to be drilled into the Cladhan Southern Channel area in Block 210/29c of the Northern North Sea, in 498 ft of water. ADTI managed the drilling operation using the Transocean Sedco 704 semi-submersible rig. The well encountered the target sandstone 80 feet deeper than prognosis, though near to the revised lowest error margin. No hydrocarbon shows were found, with lost circulation experienced near the top of the reservoir and a suspected water kick at the bottom of the well. The drilling was terminated early, close to the estimated base of the target Sequence 1 sands, due to well control issues. Faulting may have been a factor in the resulting fluid loss and well influx situation. The wireline logging and sampling programme was cancelled as a result.

The Southern Channel is located in Quad 210, Blocks 29c & 30b, adjacent to the East Shetland Platform, approximately 20 km north west of the South Cormorant platform and 150 km north east of the Sullom Voe oil terminal. The Cladhan oil discovery is located approximately 4.5 km due north of the prospect and is believed to be a direct analogue, and part of the same depositional system.

The Southern Channel prospect has similar characteristics to the Cladhan oil discovery, comprising a stratigraphic trap of slump/channel sands of Late Oxfordian to Late Kimmeridgian age, enclosed within the Kimmeridge Clay Formation.

The reservoir sands are located immediately east of the East Shetland Platform boundary fault and lie on a terrace to slope area, adjacent to a relay ramp that links a series of down to the east normal faults into the basin area.

The location for the proposed well targeted a mid point in a SW-NE orientated channel system east of the main East Shetland Boundary Fault and is approximately 2.7 km south of the 210/30a-4Y well.

The main reservoir target interval on the terrace area lies within the Kimmeridge Clay Formation and has been informally named the Cladhan Sands. In general terms two sand prone intervals are recognized in the Northern Cladhan wells. The primary reservoir named Sequence 1 is Late Oxfordian to Late Kimmeridgian in age and all seven wells have penetrated this interval. A second younger interval of Early Volgian age named Sequence 2, has also been encountered but not in all wells and is variably developed across the Cladhan structure.

Reservoir distribution and quality is controlled by the presence of turbidite channel and fan lobe sands together with the presence of dolomite cement and both authigenic and detrital clay content. The derivation of the dolomite cement within the Cladhan reservoir is not yet understood but its presence is clearly an important consideration for reservoir deliverability. Calcareous cement is common in the Middle and Late Jurassic reservoirs in the East Shetland Basin and Viking Graben.

The likely source of the hydrocarbons in the Cladhan Sands is from the Kimmeridge Clay black shales present downdip from the more deeply buried basin to the east/south east. The prospect is adjacent to, and along trend from the Tern and South Cormorant Fields for which the Kimmeridge Clay is an effective source.

The Cladhan accumulation is primarily a stratigraphic trap comprising slumped and channelized deep water turbidite sands laterally encased in a marine shale source rock (Kimmeridge Clay Formation). The sands may pinch out up dip but may also abut basement
rocks in the hanging wall of the East Shetland boundary fault. Because the OWC in Cladhan is as yet unknown, it is equivocal whether or not a structural closure or stratigraphic pinch out of the reservoir occurs down dip.

The Cladhan 210/29c-5 well was planned as a deviated exploration well with an inclination of 32.91^{o} and an azimuth of 51.32^{o} on tangent section from 7097 ft MDRT to TD. The planned target tolerance was of 75 m radius centered on the planned target position.
Last active survey at 10232 ft MDBRT showed: inclination 32.53^{o}, azimuth 50.90^{o}, TVDBRT 9773.68 ft (-9577.92 ft TVDSS).

The proposed well TD was at -9796 ft TVDSS which was anticipated to be +/- 150 ft MD below the Base Sequence 1 Sand. Due to drilling difficulties encountered, mud losses and fluid influx the decision was taken to TD earlier and to abandon the well. The well reached TD at 10361 ft (-9686.7 ft TVDSS) on 8th of April 2012.

1.1 Primary Objectives

- Drill the Well with no recordable accidents and environmental incidents.
- Drill and meet all well objectives within budget.
- Establish the presence of hydrocarbon bearing sands in the Southern Channel.
- Acquire core across as much of the Cladhan Sequence 1 Sand interval as possible if hydrocarbon bearing.
- Acquire both pressure and fluid sample points, across any sand intervals penetrated in the Kimmeridge Clay Formation regardless of fluid type encountered.
- The Well will be drilled in such a way that it can be suspended and the upper hole sections reused at a later date for either appraisal or development drilling, if required.
- The coring point will be picked on encountering hydrocarbon bearing sands within the Sequence 1 Sand interval.
- An “At Bit” resistivity tool will be included in the LWD suite while drilling the Kimmeridge Clay Formation to aid the picking of the coring point (dependant on hole size and availability).
- LWD logs (GR and Resistivity) will be run as a minimum data acquisition requirement.
- The TD of the Well must allow all logging sondes to pass below any recorded hydrocarbon bearing formation.
- A Well Test will be undertaken in the success case.

The offset reference wells for this project were. Wells that have penetrated the Cladhan reservoir sands in bold italic text.

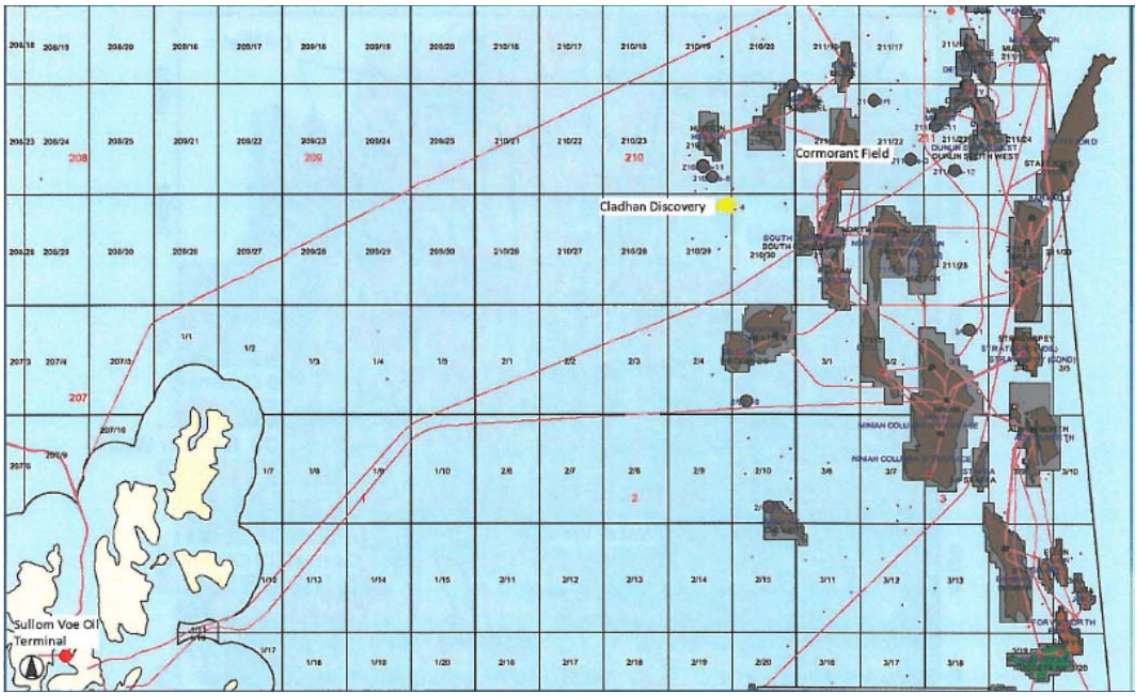
Well	Year	Drilled Status
210/29-1	1975	P & A Dry
210/29-2	1977	P & A Dry
210129a-4	***2008***	***P &A Oil Well***
210129a-4Z	***2010***	***P &A Oil Well***
210129a-4Y	***2010***	***P &A Oil Well***
210130a-4	***2011***	***P &A Oil Well***
210130a-4Z	***2011***	***P & A Tight (Cemented)***
210130a-4Y	***2011***	***P &A Water***
210130a-4X	***2011***	***P & A Water & Minor Oil***
210/30-1	1975	P & A Oil Shows
210/30b-3	1992	P & A Oil Shows

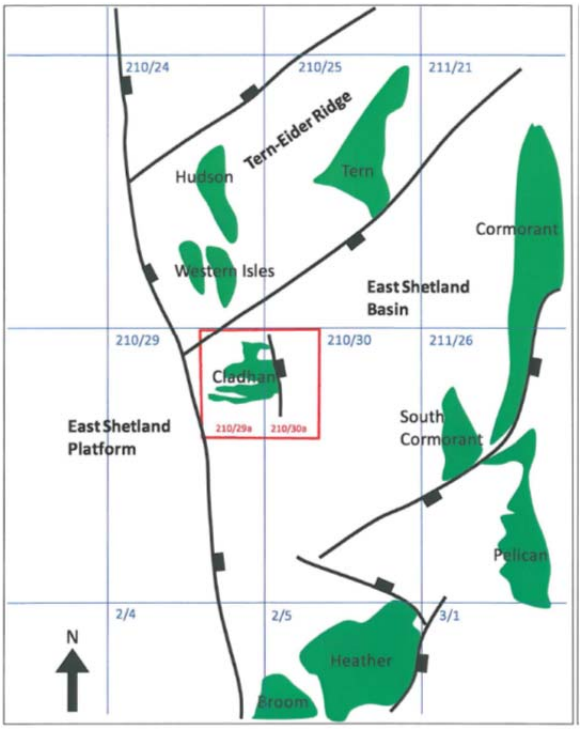
RESULTS:

The Kimmeridge Sequence 1 sands were penetrated 80 feet TVD deeper than prognosis. Lithology description was made difficult due to the cutting action of the PDC bit - virtually all cuttings were crushed or sliced, especially sandstone cuttings, with few examples of original fabric. Most of the sandstone cuttings observed consisted of soft to firm, white rock flour and the original rock matrix is partly made up of a calcareous cement. Slow drill rates imply low porosity over much of the reservoir sands. Oil was not in evidence – oil shows were not observed; if any existed they were masked by the oil-based mud. Low percentages of back-ground gas were recorded but the heavier, higher components were absent. Gas shows also manifested as connection gases when the drilling mud system was under-balanced due to the lost circulation event. The gas source was probably in cleaner sands at around 10250 ft MD, -9592 ft TVDSS, but from 10260 ft MD the slower ROP indicates well cemented, low porosity rock. Again, no oil shows were observed from there. The base of the Sequence 1 was not identified by LWD logs but correlation implied that prognosis was close and the well TD was close to the base of the sands.

2. LOCATION MAP

The 210/29c-5 well is located on Cladhan South Channel prospect on Quad/Block 210/29c adjacent to the East Shetland Platform, approximately 20 km north west of the South Cormorant platform and 150 km north east of the Sullom Voe oil terminal.





Location Map for 210/29c-5

3. WELL DATA SUMMARY

Well:	210/29c-5
Pre-spud designation:	The well was designed to establish whether or not hydrocarbons were present in the Cladhan Southern Sands, to acquire a core through the Sequence 1 sands (should hydrocarbons be present), and acquire pressure and fluid samples from any sand intervals found in the Kimmeridgian Clay Formation. A DST would test the deliverability, reservoir quality and connected volume should hydrocarbons be found. The well may be suspended for future development.
Well Type:	Deviated Exploration
Operator:	Sterling Resources
Location:	UK offshore - Northern North Sea
Basin Name:	East Shetland
Prospect:	Cladhan
Quad/Block:	210/29c
Equity:	Sterling Resources (UK) Ltd.: 25% Agora Oil and Gas UK Ltd.: 20% Valiant Petroleum Ltd.: 30% Wintershall (UK North Sea) Ltd.: 25%
Surface Location:	Latitude: 61° 05’ 03.126” N Longitude: 00° 47’ 50.028” E X UTM: 381 186.45 m E Y UTM: 6 774 326.45 m N Datum (MSL): ED 1950, UTM Zone 31E, Spheroid International 1924
Bottom Hole Coordinates	Latitude: 61° 05’ 16.413”N Longitude: 00° 48’ 22.040”E X UTM: 381,679.74 m E Y UTM: 6,774,721.33 m N
Target Formation:	Kimmeridge Clay Fm.
Rig:	Sedco-704
Rig Contractor:	Transocean
RT-MSL:	87 ft
RT-SEABED:	585 ft
Water depth:	498 ft
Spud date:	17th March, 2012
TD Reached:	8th April 2012
Total depth:	10361 ft (-9686.7 ft TVDSS)

HOLE SIZE and CASING DATA

Hole Size (in)	Depth (ft MDRT)	Casing Shoe (ft MDRT)	Casing Diam (in)	Properties ppf/wall/grade
26"x36"	835	822	30"-20"	457-310/-/X52-X56
17 ½"	3032	3009	13 3/8"	72/0.514/L-80
12 ¼"	9143	9123	9 5/8"	53.5/0.545/L-80
8 ½"	10361	-	-	-

BIT DATA

Bit Run	Type	Size (in)	Depth in (ft)	Depth out (ft)	Footage (ft)
1	HDBS - XT1GSRC (2-2-WT-A-E-0-NO-TD 6.1HR)	26"	585	835	250
2	SMITH – TCTi (2-2-NO-A-E-0-NO-TD 6.8HR)	17 ½"	835	3032	2197
3	HUGHES – QD506X (1-6-BT-A-X-IN-LT-TD 83.6HR)	12 ¼"	3032	9143	6111
4	HALLIBURTON – FXD57R (3-3-BT-A-X-IN-WT-TD 31.2HR)	8 ½"	9143	10361	1218

MUD SYSTEM: MI SWACO

Depth ft	MW ppg	FV s/q	PV/YP @120^{0}F	GELS @120^{0}F lb/100ft^2	HTPH Filtrate cc/3o'	HTPH Cake in/32	Corrected Solids % Vol	ESV mV	Oil/Water Ratio %
26"x36" and 17½" Hole Section									
Drilled with seawater and regular Hi-Vis sweeps.									
12 ¼" Hole Section drilled with VERSACLEAN LTOBM									
Depth ft	MW ppg	FV s/q	PV/YP @120^{0}F	GELS @120^{0}F lb/100ft^2	HTPH Filtrate cc/3o'	HTPH Cake in/32	Corrected Solids % Vol	ESV volts	Oil/Water Ratio %
3032	9.5	83	19/17	11/14/16	4	1	8.08	376	70/30
3329	9.5	85	22/27	17/21/23	4	1	7.11	506	67/33
4170	9.5	83	21/32	18/22/24	4	1	8.43	627	68/32
4620	9.5	71	18/32	18/20/21	4.2	2	8.43	1000	68/32
5190	9.5	72	20/35	18/20/21	4	2	8.43	675	68/32
5667	9.5	62	16/30	17/20/22	4.2	2	8.7	630	69/31
6100	9.5	60	17/32	20/21/22	4.2	2	8.47	725	69/31
6570	9.9	62	15/26	16/18/22	4.6	2	9.18	724	71/29
7100	9.9	62	16/25	16/18/21	4.4	2	9.2	724	71/29
7248	10.0	64	19/33	21/25/27	4.2	2	11.18	783	70/30
7680	10.0	60	18/32	20/21/24	4.6	2	10.12	824	70/30
7808	10.0	59	18/29	18/22/24	4.4	2	10.17	840	73/27
8216	10.0	59	18/29	18/23/25	4.4	2	10.15	754	73/27
8595	10.0	59	17/28	17/20/22	4.4	2	10.17	810	72/28

8858	10.0	59	20/27	18/23/25	4.4	2	10.4	734	73/27
9143	10.0	60	18/29	18/23/25	4.4		10.4	762	73/27
8 ½" Hole Section drilled with VERSACLEAN OBM type									
9167	13.1	92	25/50	17/23/24	4.4	2	20.53	764	72/28
9450	13.4	65	38/39	24/28/29	4.6	2	24.4	754	72/28
9860	13.4	76	32/39	20/22/25	3.4	2	24.62	962	73/27
10146	13.4	70	30/35	20/22/24	3.4	2	24.62	948	73/27
Dynamic losses at 10146ft, reduced mud weight									
10146	12.9	64	29/29	16/21/22	4	2	22.61	824	72/28
10146	12.8	64	29/28	16/21/22	4	2	22.62	824	72/28
10180	12.8	71	26/30	18/23/24	4	2	22.55	731	74/26
10320	12.6	69	26/33	18/22/25	3.8	2	20.64	851	74/26
Flow check 10361ft: well flowed, gain 2.8bbl. Well shut-in, initial SIDPP 40 psi, SICP 60 psi; stabilized SIDPP 280psi, SICP 190psi									
10361	12.6	69	26/33	18/22/25	3.8	2	20.62	768	74/26
10361	12.6	71	26/33	19/24/25	3.8	2	21.78	964	74/26
10361	12.65	78	24/32	18/23/24	4.2	2	20.63	911	74/26
10361	12.7	72	25/35	19/24/26	4.4	2	20.67	825	74/26
10361	13.1	75	27/29	19/23/25	4.3	2	21.68	926	74/26
10361	13.2	82	27/33	20/23/25	3.6	2	21.62	891	74/26

MEASUREMENT WHILE DRILLING LOGS: BHI

Hole Size (in)	Run no.	Tools Run/Curves	Interval Logged (ft)	Date In-Out	Comments
26"x36"	1	NaviGamma Directional-Gamma/GRAFM	585 - 835	17/3/12 18/3/12	Good run.
17 ½"	2	NaviGamma Directional-Gamma/GRAFM	835 - 3032	20/3/12 22/3/12	Good run.
12 ¼"	3	AutoTrak + directional + GR + Res (Res not included) Directional-Gamma/GRAFM	3032 - 9143	26/3/12 2/4/12	Good run.
8 ½"	4	OnTrak Directional-Near Bit Res-GR-Res-ECD	9143 - 10361	4/4/12 12/4/12	Generally good run. Lost circulation at 10146 ft; pumped LCM; pulser blocked and not pulsing for 3hr50min whilst treating losses. Self-cleared. No data lost. Stick-slip increasing towards end of run from 10150 ft.

WIRELINE LOGGING: BHI – Baker Atlas

Hole Size (in)	Run no.	Tools Run	Interval Logged (ft)	Date In-Out	Comments
					Wireline logging and sampling programme cancelled.

CUTTINGS SAMPLES

The cutting samples were collected according the programme as follow:

Hole Section	Washed & Dried Samples	Bulk Wet Samples	Sample Interval
12 ¼" section From first returns to 3032 ft	2	2	50 ft composite sample
8 ½" section From 9143 ft MDBRT (base Upper / Lower Cretaceous / Upper Jurassic)	2	3	5-10-20 ft composite sample (depending on ROP) Additional spot samples were taken in the reservoir

See *APENDIX A: Sample Manifest_210-29c-5_TD.doc*

SAMPLE DESTINATIONS:

As per attached manifests

FROM:	*TO:*
Geoservices Crew, **ADTI** **SEDCO 704** **UK OFFSORE** **FIELD: Cladhan** **WELL: 210/29c-5**	**Palytech Processing Ltd** **(Attn. Les Riley)** **2 Lorn Street** **Birkenhead** **CH41 6AR** **Contact: Alison/Phil** **Tel: 0151 6668406** **Email: PALYLAB@aol.com**
DATE: 10th April 2012	***Reference:***

Goods:

Qty	*Asset No:*	*Description*	*Serial No:*	*Unit Price Euro*
1		**Box with Hot shot wet cuttings samples from 10160ft to 10360ft (30ft interval)**	**Na**	**na**

Box Number:	*Weight:*	*Size:*
Box # 1	**5 kg**	**40 x 16 x 8 cm**

TOTAL	*Euro*

	Received at Base by:
Print Name:	
Signature:	
Date:	

BACKLOAD MANIFEST

STERLING RESOURCES **Date: 12 April 2012**
SEDCO 704
WELL: Cladhan 210/29c-5
CONTAINER: AMA 719

SET A: Wet Unwashed Cuttings Samples

Box No.	Well	Section	Depth from – to (ft)	Missed Samples
1	**Cladhan 210/29c - 5**	12 ¼"	3042 - 4450	
2	**Cladhan 210/29c - 5**	12 ¼"	4500 – 5950	
3	**Cladhan 210/29c - 5**	12 ¼"	6000 – 7400	
4	**Cladhan 210/29c - 5**	12 ¼"	7450 – 8750	
5	**Cladhan 210/29c - 5**	12 ¼"	8800 – 9143	
6	**Cladhan 210/29c - 5**	8 ½"	9160 -9470	9210, 9330, 9370, 9420
7	**Cladhan 210/29c - 5**	8 ½"	9480 – 9800	9490, 9610, 9760, 9780
8	**Cladhan 210/29c - 5**	8 ½"	9810 – 10100	9860, 9970, 10050,
9	**Cladhan 210/29c - 5**	8 ½"	10110 - 10360	10270

Send to:

C21 Data Services Ltd
8 Crombie Road
Aberdeen
AB11 9QQ

Contact: Sean Storrie, **Email**: ss@c21ds.com

BACKLOAD MANIFEST continued

STERLING RESOURCES **Date: 12 April 2012**
SEDCO 704
WELL: Cladhan 210/29c-5
CONTAINER: AMA 719

SET B: Wet Unwashed CuttingsSamples

Box No.	Well	Section	Depth from – to (ft)	Missed Samples
1	**Cladhan 210/29c - 5**	12 ¼"	3042 - 4450	
2	**Cladhan 210/29c - 5**	12 ¼"	4500 – 5950	
3	**Cladhan 210/29c - 5**	12 ¼"	6000 – 7400	
4	**Cladhan 210/29c - 5**	12 ¼"	7450 – 8750	
5	**Cladhan 210/29c - 5**	12 ¼"	8800 – 9143	
6	**Cladhan 210/29c - 5**	8 ½"	9160 -9470	9210, 9330, 9370, 9420
7	**Cladhan 210/29c - 5**	8 ½"	9480 – 9800	9490, 9610, 9760, 9780
8	**Cladhan 210/29c - 5**	8 ½"	9810 – 10100	9860, 9970, 10050,
9	**Cladhan 210/29c - 5**	8 ½"	10110 - 10360	10270

Send to:

BGS Core Store
British Geological Survey,
Kingsley Dunham Centre,
Keyworth,
Nottingham,
NG12 5GG

Contact: Scott Renshaw, **Tel:** 0115 9363 228 **Email:** sren@bgs.ac.uk

BACKLOAD MANIFEST continued

STERLING RESOURCES **Date: 12 April 2012**
SEDCO 704
WELL: Cladhan 210/29c-5
CONTAINER: AMA 719

SET C: Washed and Dried Cuttings Samples

Box No.	Well	Section	Depth from – to (ft)	Missed Samples
1	**Cladhan 210/29c - 5**	12 ¼"	Box 1: 3042 – 4300 Box 2: 4350 – 5650 Box 3: 5700 – 7000 Box 4: 7050 – 8500	
2	**Cladhan 210/29c - 5**	12 ¼"	Box 5: 8550 – 9143	
3	**Cladhan 210/29c - 5**	8 ½"	Box 6: 9150 - 9500 Box 7: 9510 - 9820 Box 8: 9830 - 10180	9150, 9210, 9330, 9370, 9420, 9490, 9610, 9760, 9780, 9860, 9970 10050, 10130, 10140
4	**Cladhan 210/29c - 5**	8 ½"	Box 9: 10190 - 10360	10270

Send to:

C21 Data Services Ltd
8 Crombie Road
Aberdeen
AB11 9QQ

Contact: Sean Storrie, **Email**: ss@c21ds.com

BACKLOAD MANIFEST continued

STERLING RESOURCES **Date: 12 April 2012**
SEDCO 704
WELL: Cladhan 210/29c-5
CONTAINER: AMA 719

SET D: Washed and Dried Cuttings Samples

Box No.	Well	Section	Depth from – to (ft)	Missed Samples
1	**Cladhan 210/29c - 5**	12 ¼"	Box 1: 3042 – 4300 Box 2: 4350 – 5650 Box 3: 5700 – 7000 Box 4: 7050 – 8500	
2	**Cladhan 210/29c - 5**	12 ¼"	Box 5: 8550 – 9143	
3	**Cladhan 210/29c - 5**	8 ½"	Box 6: 9150 - 9500 Box 7: 9510 - 9820 Box 8: 9830 - 10180	9150, 9210, 9330, 9370, 9420, 9490, 9610, 9760, 9780, 9860, 9970 10050, 10130, 10140
4	**Cladhan 210/29c - 5**	8 ½"	Box 9: 10190 - 10360	10270

Send to:

BGS Core Store
British Geological Survey,
Kingsley Dunham Centre,
Keyworth,
Nottingham,
NG12 5GG

Contact: Scott Renshaw, **Tel:** 0115 9363 228, **Email:** sren@bgs.ac.uk

BACKLOAD MANIFEST continued

STERLING RESOURCES **Date: 12 April 2012**
SEDCO 704
WELL: Cladhan 210/29C-5
CONTAINER: AMA 719

SET E: Mud Samples

Box No.	Well	Section	Depth (ft)	operation
1	**Cladhan 210/29c - 5**	12 ¼"	3042, 4500, 6000, 7500, 9000, 9143	Drilling
		8 ½"	9151, 9700, 9750, 9800, 9850, 9900, 9950, 10000,10060, 10100,10150,10200, 10250, 10300, 10350, (7 mud samples taken at requested strokes/ B/u strokes, see table below)	Drilling

BACKLOAD MANIFEST continued

(SET E: Mud Samples continued)

9/4/2012	12:40	Circulation w/12.5 ppg mud, sample taken after 2500 stk
9/4/2012	14:55	Circulation w/12.5 ppg mud, sample taken after 5350 stk
9/4/2012	16:50	Circulation w/12.5 ppg mud, sample taken after 7740 stk
10/4/2012	6:50	Displacing well to 13.0 ppg mud, sample taken after 3664 stk
10/4/2012	10:00	Displacing well to 13.0 ppg mud, sample taken after 7330 stk (B/up)
10/4/2012	22:40	Displacing well to 13.2 ppg mud, sample taken after 7330 stk (B/up)
11/4/2012	22:05	Circulating B/up at the shoe, sample taken after 7070 stk (B/up)

Send to:

C21 Data Services Ltd
8 Crombie Road
Aberdeen
AB11 9QQ

Contact: Sean Storrie, **Email**: ss@c21ds.com

BACKLOAD MANIFEST continued

STERLING RESOURCES **Date: 12 April 2012**
SEDCO 704
WELL: Cladhan 210/29c-5
CONTAINER: AMA 719

SET F: Wet Unwashed Cuttings Samples

Box No.	Well	Section	Depth from – to (ft)	Missed Samples
1	**Cladhan 210/29C - 5**	8 ½	9160 -9470	9210, 9330, 9370, 9420
2	**Cladhan 210/29C - 5**	8 ½	9480 – 9800	9490, 9610, 9760, 9780
3	**Cladhan 210/29C - 5**	8 ½	9810 – 10100	9860, 9970, 10050,
4	**Cladhan 210/29C - 5**	8 ½	10110 - 10360	10270

Send to:

Palytech Processing Ltd
(Attn. Les Riley)
2 Lorn Street
Birkenhead
CH41 6AR

Contact: Alison/Phil, **Tel:** 0151 6668406,
Email: PALYLAB@aol.com

4. FORMATION TOPS

Picked up on field based on cuttings examination/gas shows/MWD

Wellsite Tops (provisional only)	Prognosis		Uncert.	Actual		Difference
	MDRT (ft)	TVDSS (ft)	+/- (ft)	MDRT (ft)	TVDSS (ft)	TVDRT (ft) -high /+ low
Seabed/Recent	585	-498	10	585	-498	0
Early Eocene/Late Palaeocene – Balder Fm.	3589	-3502	50	3604	-3516.8	14.8 low
Late Cretaceous – Shetland Group	5487	-5400	50	5517.5	-5430.3	30.3 low
Early Cretaceous – Cromer Knoll Group	9394	-8879	150	9200	-8710	169 high
Base Early Cretaceous	9633	-9080	100	9708.5	-9137.5	57.5 low
Top Sequence 2				9782	-9199.2	
Base Sequence 2				9825	-9235.3	
Top Sequence 1	10027	-9410		10128	-9490.3	80.3 low
Base Sequence 1	10336	-9670	100			
TD	10486	-9796	-	10361	-9687	

5. LITHOSTRATIGRAPHY

All depths are drilled depths (MD), unless otherwise stated, referred to the rotary table.

Lithological descriptions from 3032 ft (first returns) to TD at 10361 ft MD are based on cutting samples examined at the wellsite. Samples were collected as follows:

- 50 ft intervals from 3232 ft to 9143 ft – 12 ¼" section
- 5-10 ft intervals from 9143 ft to 10361 ft – 8 ½" section

Formation Tops were initially picked on field based MWD/LWD logs and cuttings lithology/gas shows

NEOGENE - PALEOGENE

Holocene - Paleocene Undifferentiated

585 – 5517.5 ft MD
498– 5430 ft TVDSS

The Holocene to Paleocene formation was drilled from the seabed at 585 ft to 5517.5 ft with the first cutting samples being analysed starting from 3032 ft (first returns) on 12 ¼" section. The lithology encountered consists mainly of massive silty/sandy claystone layers alternating thin beds of limestone/dolomite and sand/sandstone (becoming thicker into lower interval) throughout all the section. Coal stringers and tuffaceous claystone were seen into Early Eocene (Balder) and calcareous claystones grading marl were seen into Lower Paleocene (Danian) from 5436 ft.

The recorded average background gas for this interval varied from 0.04 % to 0.10 % with no significant gas peaks being observed.

Eocene - Undifferentiated

2215 – 3604 ft MD
2127.9 – 3516.8 ft TVDSS

First cuttings returns from 3032ft MD.
All PDC cuttings (crushed or sliced)

3042 - 3604

CLAYSTONE medium grey to darkish grey, becoming greenish-grey to olive-grey & medium grey to darkish grey, soft to moderately hard, sub-blocky, non-calcareous, occasional carbonaceous? specks; generally variably highly silty to very finely sandy, arenaceous.

ARGILLACEOUS SANDSTONE / SANDY CLAYSTONE: medium grey, soft to firm, silty to very finely sandy, floating grains, highly argillaceous (matrix).

LIMESTONE mostly rock flour, light yellowish-grey, soft to firm, mudstone, silty, arenaceous, argillaceous, dolomitic; occasionally grey-

brown, hard, siliceous, sandy; yellowish-grey, tan to yellow-brown, soft to firm, arenaceous, argillaceous.

Balder Formation (Early Eocene)

3604 – 3734 ft MD
3516.8 – 3646.8 ft TVDSS

Massive claystone beds, and rarely stringers of sandstone and coal.

CLAYSTONE: greenish-grey to olive-grey & darkish grey, soft to moderately hard, sub-blocky, non-calcareous; olive-grey - variably silty to very finely sandy, arenaceous, darkish grey - slightly silty to sandy, tuffaceous in places.
COAL: (traces) black, granular. firm.
SANDSTONE: medium grey, very fine, soft to firm, highly argillaceous.

Depth Interval ft MD	BACKGROUND GAS									
	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
Eocene	ROP: min/max/avg – 42 / 238/ 149									
3032-3734	0.04	0.1	0.07	80	0	0	0	0	0	0

Paleocene, Undifferentiated

3734 – 5518 ft MD
3646.8 – 5430 ft TVDSS

<u>3734 – 4990</u>

Thick section of silty and sandy claystones with thin sandy limestones and argillaceous sandstone bands.

CLAYSTONE: olive-grey and medium to darkish grey, soft to moderately hard, becoming harder, sub-blocky, non-calcareous, olive-grey - variably silty to very silty to very finely sandy, arenaceous, occasional carbonaceous specks, medium to darkish grey – variably slight silty / sandy, arenaceous, tuffaceous in part.
ARGILLACEOUS Sandstone: medium grey, very fine, soft to firm, highly argillaceous.
SANDSTONE: light to medium grey, friable to moderately firm, silty to fine grained, variably argillaceous, with carbonaceous fragments / flakes / laminations; also loose SAND, quartz, clear, colourless, translucent & transparent, fine to medium, subangular to well rounded; light grey, light greenish-grey, very fine, friable to soft, slightly argillaceous.

LIMESTONE: partly rock flour, light grey, grey-white, medium grey, friable to moderately hard, occasionally hard, very finely sandy, arenaceous (sandy limestone / calcareous sandstone); calcareous matrix, occasionally grey-brown, dolomitic, silty, arenaceous, firm to hard, brittle.

DOLOMITE: traces, yellowish-grey, yellowish-brown, tan, soft to firm, mudstone, (partly dolomitic limestone).

4990 – 5436

Graded sequences of claystones and sandstones, then silty claystones becoming marly at the base.

CLAYSTONE: olive-grey, occasionally dark grey, soft to moderately hard, non-calcareous, silty & arenaceous.

SANDSTONE: light grey, light greenish-grey, very fine, friable to soft, slightly argillaceous.

SANDSTONE / SAND: mostly as loose quartz, clear, generally colourless, occasionally opaque, coloured, very fine to medium grain, subangular to well rounded, sub-elongate to subspherical.

SANDSTONE: partly as rock flour, greyish-white, light grey-white, light brownish white to tan, grey-brown to olive, friable to soft, slightly to moderately calcareous, arenaceous?, variably argillaceous in part.

CLAYSTONE / MARL: olive-grey, darkish grey, firm to moderately hard, slightly silty, becoming slightly calcareous.

MARL: greenish-grey, firm to moderately hard, highly calcareous.

Danian
5436 –5518

Base of the Paleocene; thin limestone capping section of thin calcareous claystone and marl beds, turning to marl at the base.

LIMESTONE: white, off-white, moderately hard to hard, mudstone, chalky.

CLAYSTONE: medium to light grey, dark grey, slightly to moderately calcareous.

MARL: greenish-grey, olive-grey, firm to moderately hard, variably calcareous.

Depth Interval ft MD	BACKGROUND GAS									
	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
Paleocene	ROP: min/max/avg – 39 / 221/ 117.5									
3734-5518	0.1	0.16	0.12	350	0	0	0	0	0	0

Late Cretaceous

5518 – 9200 ft MD
5430 – 8710 ft TVDSS

The lithology comprised of massive claystones/marls with inter-bedded thin limestone and dolomite stringers throughout. The top part of the section is represented by grey marls with thin limestone interbedded. The middle interval consisted of medium to medium-dark grey to greyish black claystones with thin limestone/dolomite stringers interspersed. In the basal section, the lithology was represented mainly by medium grey marls and dark grey claystones with more numerous interbedded limestone stringers.

Mastrichtian
5518 – 5994 ft MD

Thick marl section with occasional thin limestones and claystones.

MARL: medium to dark grey, becoming darker, firm to moderately hard, locally grading to calcareous claystone.
CLAYSTONE: medium to lightish grey, dark grey, moderately hard to hard, slightly to moderately calcareous.

LIMESTONE: pale grey, yellowish-brown, firm to moderately hard, argillaceous.

Campanian
5994 – 6478 ft MD

Thick slightly calcareous claystone section with thin limestones at the top and occasional thin dolomites throughout.

LIMESTONE: off-white, cream, firm to moderately hard, mudstone, chalky.
CLAYSTONE: dark grey, medium grey, firm to moderately hard, slightly to moderately calcareous, occasional nodular pyrite.
DOLOMITE: light yellowish-grey, light brownish-grey, tan, soft to hard, mudstone, cryptocrystalline or chalky, dense, brittle, locally slightly argillaceous.

Santonian
6478 – 7760 ft MD

Thick claystone section, generally non-calcareous though calcareous towards the base, with occasional thin dolomite or limestone laminations.

CLAYSTONE:	dark grey to medium grey, firm to moderately hard, generally non-calcareous, occasionally slightly calcareous, locally slightly silty.
LIMESTONE:	traces off-white, cream, medium hard to hard, mudstone, chalky.
DOLOMITE:	light yellowish-grey, light brownish-grey, tan, soft to hard, mudstone, chalky, slightly argillaceous.
LIMESTONE:	light yellowish-grey, firm to moderately hard, chalky to microcrystalline, slightly silty, trace pellets / concretions.

Coniacian
7760 – 8740 ft MD

Again a thick section of claystone, stretching from 7760ft md to 8540ft md, but slightly to moderately calcareous and occasionally marly and still with the occasional thin dolomite laminations. After 8540ft md there are gradations from marl to claystone and one marker limestone at 8643ft md. A coarse quartz fragment from around 8650ft md suggests a fault perhaps.

CLAYSTONE:	medium grey to darkish, moderately hard to hard, slightly calcareous to occasionally moderately calcareous, locally marly, occasionally locally silty. Trace Calcite.
DOLOMITE:	light yellowish-grey, light brownish-grey, tan, soft to hard, mudstone, chalky, slightly argillaceous.
LIMESTONE:	Traces light grey, firm, arenaceous? mudstone, argillaceous.
MARL:	medium grey, darkish grey, soft to firm, moderately to highly calcareous.
QUARTZ:	traces, clear, colourless, angular, vein ? quartz with black accessory mineral.

Turonian
8740 – 9079 ft MD

A thick Marl section with thin limestone graded interbeds towards the base.

MARL:	medium grey, darkish grey, soft to firm, moderately to highly calcareous.
LIMESTONE:	traces, stringers, off-white to brownish-grey, soft rock flour, arenaceous?. Then beds, moderately hard to hard rock flour, light grey, wackestone, cryptocrystalline, calcareous / dolomitic matrix, arenaceous?, sandy?, trace glauconite? flecks.

Cenomanian
9079 – 9200 ft MD

Here, a short section of Marls grading to calcareous Claystone.

CLAYSTONE: pale green-grey, dark red-brown, firm to hard, non-calcareous; darkish grey to dark grey, moderately hard to hard, slightly to non-calcareous.

CLAYSTONE: brownish grey to olive grey, greenish grey, soft to firm, plastic and sticky in places, sub-blocky to blocky, very slight to slight calcareous, moderate to calcareous in places grading marl, slight silty.

Depth Interval ft MD	BACKGROUND GAS									
	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
Late Cretaceous	ROP: min/max/avg – 330.5/ 209/ 82.5									
5518-7200	0.11	0.21	0.16	580	0	0	15	0	0	0
7200-9200	0.05	0.16	0.10	275	0	0	10	0	0	0

Early Cretaceous
Albian / Aptian ft MD
9200 – 9708

A 508 ft (md) thick section of claystone grading to marl with depth. The claystones have occasional thin limestone marl and calcareous sandstone beds, and after 150 feet the claystone gradually grades to marl with an increasing carbonate content. The appearance of reddish brown claystones/marls has been noticed

(9200-9400)

CLAYSTONE: brownish-grey to dark greenish-grey, occasionally greenish-grey, reddish-brown, medium grey, medium brownish-grey, firm, non to very slightly calcareous, slightly micro-micaceous, locally silty.

SANDSTONE: yellowish-brown, dusky-yellow, very fine to silty, moderately to well sorted, angular, firm, calcareous cement, no visual porosity, any shows masked by OBM, trace pyrite, trace glauconite.

MARL: medium grey to greenish-grey, moderately firm to firm, locally variably silty.

LIMESTONE: light to medium grey, light greenish-grey, common dark argillaceous streaks, mudstone, firm, micro- to cryptocrystalline, argillaceous, silty in places.

(9400-9640)

LIMESTONE: varicoloured, light yellowish-brown to dusky-yellow, pale brown, occasionally light grey, mudstone, firm, occasional moderate hard to hard, micro to crypto-crystalline, argillaceous streaks in places, dolomitic in places. Traces, cream, soft, mudstone to wackestone, chalky to microcrystalline.

MARL: medium grey, medium greenish-grey, soft to firm, plastic and sticky.

CLAYSTONE: brownish-grey, light to dark grey, pale to dark green-grey, soft to firm, occasionally hard (dark grey, non hygroscopic), variably calcareous, slightly micro- micaceous, variably calcareous, occasionally silty, locally Marly.

(9640-9708)

MARL: red-brown, soft, variably calcareous.

CLAYSTONE: light to medium grey, grey-brown, brown, dark grey to black, non- to variably calcareous.

LIMESTONE: cream, off white to light grey, mudstone, soft to hard, cryptocrystalline, chalky in part, locally Marly, trace Pyrite.

Depth Interval ft MD	**BACKGROUND GAS**									
	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
Early Cretaceous	ROP: min/max/avg – 330.5/ 209/ 82.5									
5518-7200	0.11	0.21	0.16	580	0	0	15	0	0	0
7200-9200	0.05	0.16	0.10	275	0	0	10	0	0	0

JURASSIC
CromerKnoll Group
Kimmeridge Clay Formation 9708 ft – 10361 ft MDRT
-9137 ft– -9686.7 ft TVDSS

653 ft (md) thick section of claystones inter-bedded calcareous sandstone, siltstone.

(9708 – 9782)

CLAYSTONE: dark blackish-brown, firm to moderately hard, non-calcareous. Shows: no direct fluorescence; dull pale green-yellow cut fluorescence.

CALCAREOUS SANDSTONE: rock flour, pale grey to white, soft (crushed), slightly argillaceous, calcareous matrix, possibly silty to very fine grained. No HC shows - dull grey-white mineral fluor, feint green-yellow cut fluor.

Top Sequence 0 9782 ft – 9825 ft MDRT
-9199 ft– -9235 ft TVDSS

CALCAREOUS SANDSTONE: rock flour, pale grey to white, soft (crushed), slightly argillaceous, calcareous matrix, slightly to moderately calcareous; occasional floating, very fine to fine quartz sand grains; trace glauconite.

(9825 – 10128)

CLAYSTONE: dark black-brown, hard, firm to hard, occasionally silty, hard; with traces medium grey, soft, non calcareous.

CALCAREOUS SANDSTONE: rock flour, white, grey-white, occasional dark streaks, soft (crushed), slightly to locally variably argillaceous, calcareous matrix, possibly silty to very fine grained, occasional medium to coarse grains. (Baracarb in mud). No HC shows - dull grey-white mineral fluor, feint green-yellow cut fluor.

SANDSTONE: white, off white, very light grey to light greenish grey, very pale orange, very pale greenish-grey, common as rock flour, firm, traces clear quartz sand, very fine to fine, moderate sorted, subangular to subrounded, good sorting, quartz matrix – probably flour, moderate calcareous cement, carbonaceous streaks in places, poor to good visual porosity, no visual porosity.

shows obscured by OBM: bright yellow-yellowish brown mineral/OBM direct fluorescence, fast streaming yellowish white to white cut fluorescence.

SILTSTONE: reddish-brown to moderate brown, greenish-grey in places, friable, blocky, argillaceous, grading to very fine sandstone in places.

Top Sequence 1 10128 ft – 10361 ft MDRT
-9491 ft– -9686.7 ft TVDSS

SANDSTONE: off white-very light grey, white to cream rarely medium grey, common rock flour, occasional floating silt to very fine grains, variably calcareous grading to sandy limestone?, very fine to fine, rare pyrite; occasionally pale to dark green-grey & glauconitic, moderate to well sorted, friable, slight to moderate calcareous cement, common dark argillaceous streaks, occasional sandstone fragments, clear, colourless quartz, fine to medium, subangular to subrounded, very well cemented, siliceous and calcareous cement, poor to moderate visual porosity, shows: dull grey to dull yellowish grey mineral/OBM fluorescence, slow to moderate patchy streaming yellowish to yellowish white-yellowish blue cut fluorescence.

SILTSTONE: medium grey, light grey to darkish grey, brown to dark brown becoming dark brown with depth,, soft rock flour to firm to moderately hard, silt to very fine sized grains, non calcareous, argillaceous, occasionally glauconitic, locally very finely sand,. No direct fluorescence; dull yellow-green cut fluorescence (OBM).

CLAYSTONE: black-brown, pale green-grey, soft rock flour, hard, silty, grading from glauconitic Sandstone, calcareous. non-calcareous; no direct fluorescence, dull yellow-green cut fluorescence (natural or OBM).

Depth Interval ft MD	**BACKGROUND GAS**									
	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
Jurassic	ROP: min/max/avg – 9.2 / 141/ 75.1									
9708-10361	0.01	0.78	0.39	1651	88	43.9	13.5	9.2	1.4	0.7

6. CUTTING DESCRIPTIONS LOG

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
12 ¼" Section		
3032	95 5	**Claystone:** medium grey to darkish grey, soft to moderately firm, sub-blocky, non-calcareous, silty, arenaceous, carbonaceous? specks, occasional trace mica, rare trace disseminated pyrite. **Limestone:** traces, off-white, sandy to silty, calcareous cement.
3042	95 5	**Claystone**: a/a **Limestone**: a/a
3050	100	**Claystone**: a/a
3100	95 5	**Claystone**: a/a **Argillaceous Sandstone**: medium grey, soft to firm, silty to very finely sandy, floating grains, highly argillaceous (matrix).
3150	90 10	**Claystone**: a/a **Sandstone**: a/a
3200	90 10	**Claystone**: a/a **Limestone**: mostly rock flour, light yellowish-grey, soft to firm, mudstone, silty, arenaceous, argillaceous, dolomitic; occasionally grey-brown, hard, siliceous, sandy.
3250	100	**Claystone**: a/a
3300	100	**Claystone**: medium grey to darkish grey, soft to moderately firm, sub-blocky, non-calcareous, silty, arenaceous, carbonaceous? specks; locally silty to very finely sandy.
3350	60 40 traces	**Claystone**: a/a **Argillaceous Sandstone / Sandy Claystone**: medium grey, soft to firm, highly argillaceous, silty, glauconitic. **GLAUCONITE**: dark green to green-black, nodular & granular, loose.
3400	90 10	**Claystone**: a/a **Limestone**: a/a
3450	100	**Claystone**: greenish-grey to olive-grey & medium grey to darkish grey, soft to moderately hard, sub-blocky, non-calcareous, variably silty to very finely sandy, arenaceous.
3500	80 20	**Claystone**: a/a **Argillaceous Sandstone / Sandy Claystone**: medium grey, soft to firm, highly argillaceous, silty.
3550	90 10	**Claystone**: greenish-grey to olive-grey & darkish grey, soft to moderately hard, sub-blocky, non-calcareous; olive-grey - variably silty to very finely sandy, arenaceous, darkish grey - slightly silty to sandy. **Sandstone**: a/a
3600	100 traces	**Claystone**: a/a **Limestone**: light yellowish-grey, tan to yellow-brown, soft to firm, arenaceous mudstone / wakestone, argillaceous.
3650	100 traces	**Claystone**: a/a **COAL**: black, granular, firm.
3700	100	**Claystone**: olive-grey & medium to darkish grey, soft to moderately hard, sub-blocky, non-calcareous, variably slightly to very silty to very finely sandy, arenaceous, occasional carbonaceous specks.
3750	90 10	**Claystone**: a/a **Sandstone**: medium grey, very fine, soft to firm, highly argillaceous.
3800	90 10	**Claystone**: olive-grey & medium to darkish grey, soft to moderately hard, sub-blocky, non-calcareous, variably slightly to very silty to very finely sandy, arenaceous, occasional carbonaceous specks. **Sandstone**: a/a
3850	100	**Claystone**: a/a
3900	90 10	**Claystone**: olive-grey & medium grey, firm to moderately hard, sub-blocky, non-calcareous, variably slightly to very silty to very finely sandy, arenaceous. **Limestone**: partly rock flour, light grey, grey-white, friable to moderately hard, very finely sandy, arenaceous mudstone / wackestone-packstone (sandy limestone / calcareous sandstone); calcareous matrix.
3950	90	**Claystone**: a/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
	10	**Limestone**: a/a
4000	100	**Claystone**: mostly olive-grey, occasionally medium to darkish grey, soft to moderately hard, sub-blocky, non-calcareous, variably slightly to very silty to very finely sandy, arenaceous.
4050	80 20	**Claystone**: a/a **Argillaceous Sandstone**: medium grey, very fine, soft to firm, highly argillaceous.
4100	100	**Claystone**: a/a
4150	100	**Claystone**: olive-grey, occasionally medium to darkish grey, firm to moderately hard - becoming harder, sub-blocky, non-calcareous, variably slightly to very silty to very finely sandy, arenaceous.
4200	100	**Claystone**: a/a
4250	90 10	**Claystone**: a/a **Limestone**: light to medium grey, firm to moderately hard, occsionslly hard, silty to very finely sandy - sandy mudstone to calcareous siltstone / sandstone.
4300	70 30	**Claystone**: a/a **Limestone**: a/a
4350	90 10	**Claystone**: olive-grey with increasing light to darkish grey, firm to moderately hard - becoming harder, sub-blocky, non-calcareous, variably non to very silty to very finely sandy, arenaceous. **Limestone**: a/a
4400	100	**Claystone**: generally olive-grey, occasionally medium to darkish grey, firm to moderately hard - becoming harder, sub-blocky, non-calcareous, variably slightly to very silty to very finely sandy, arenaceous.
4450	90 10	**Claystone**: a/a **Limestone**: a/a
4500	50 50	**Claystone**: a/a **Sandstone**: light to medium grey, friable to moderately firm, silty to fine grained, variably argillaceous, with carbonaceous fragments / flakes / laminations; also loose SAND, quartz, clear, colourless, translucent & transparent, fine to medium, subangular to well rounded.
4550	100	**Claystone**: a/a
4600	100	**Claystone**: medium to darkish grey, occasionally olive-grey to brownish-grey, firm to moderately hard, sub-blocky, non-calcareous, variably silty & arenaceous.
4650	100	**Claystone**: a/a
4700	100	**Claystone**: medium to darkish grey, occasionally olive-grey to brownish-grey, firm to moderately hard, sub-blocky, non-calcareous, variably silty & arenaceous; occasionally sandy, very fine to coarse clear quartz, glauconitic.
4750	100	**Claystone**: a/a
4800	95 5	**Claystone**: medium to darkish grey, occasionally olive-grey to brownish-grey, firm to moderately hard, sub-blocky, non-calcareous, variably silty & arenaceous. **Limestone**: grey-brown, dolomitic, silty, arenaceous, firm to hard, brittle.
4850	100	**Claystone**: a/a
4900	80 10 10	**Claystone**: olive-grey, occasionally dark grey, soft to moderately hard, non-calcareous, silty & arenaceous. **Sandstone**: light grey, silty, friable to soft, slightly calcareous, partly as rock flour. **Limestone**: light grey, light greenish-grey, marly, soft, argillaceous.
4950	90 10	**Claystone**: a/a **Dolomite**: (partly dolomitic limestone), yellowish-grey, yellowish-brown, tan, soft to firm, mudstone.
5000	90 10	**Claystone**: a/a **Sandstone**: light grey, light greenish-grey, very fine, friable to soft, slightly argillaceous.
5050	50 50	**Claystone**: a/a **Sandstone**: mostly as loose quartz, clear, generally colourless, occasionally opaque, coloured, very fine to medium grain, subangular to well rounded, subelongate to subspherical.
5100	80 20	**Claystone**: olive-grey, occasionally dark grey, soft to moderately hard, non-calcareous, silty & arenaceous. **Sandstone**: rock flour, greyish-white, light brownish white to tan, friable to soft, slightly calcareous, arenaceous?
5150	70 30	**Claystone**: a/a **Sandstone**: a/a
5200	50 50	**Claystone**: a/a **Sandstone**: light grey-white, off-white, rock flour, very fine to fine grain, soft to friable, slightly calcareous, argillaceous in part.
5250	70	**Claystone**: a/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
	30	**Sandstone**: a/a
5300	30 70	**Claystone** : a/a **Sandstone**: a/a
5350	100	**Claystone**: medium to darkish grey, olive-grey, firm to moderately hard, non-calcareous, silty & arenaceous.
5400	80 20	**Claystone**: a/a **Sandstone**: light grey-white, off-white, grey-brown to olive, parlty rock flour, very fine to fine grain, soft to friable, slightly calcareous to calcareous, argillaceous in part.
5450	60 30 10	**Claystone / Marl**: olive-grey, darkish grey, firm to moderately hard, slightly silty, becoming silghtly calcareous. **Marl**: greenish-grey, firm to moderately hard, highly calcareous. **Limestone**: white, off-white, moderately hard to hard, mudstone, chalky.
5500	40 40 20	**Claystone**: medium to lightish grey, dark grey, moderately hard to hard, slightly to moderately calcareous. **Marl**: greenish-grey, olive-grey, firm to moderately hard, variably calcareous. **Limestone**: a/a
5550	80 20	**Marl**: a/a **Limestone**: a/a
5600	100	**Marl**: medium grey, occasionally greenish-grey, firm to moderately hard, slightly silty; trace nodular pyrite.
5650	100	**Marl**: medium grey to darkish grey, firm to moderately hard, slightly silty, locally grading to calcareous claystone.
5700	90 10	**Marl**: a/a **Limestone**: white, off-white, moderately hard to hard, mudstone, chalky.
5750	70 30	**Marl**: a/a **Limestone**: a/a
5800	90 10	**Marl**: a/a **Limestone**: yellow-brown, mudstone, firm to moderately hard, argillaceous.
5850	90 10	**Marl**: medium to dark grey, becoming darker, firm to moderately hard, locally grading to calcareous claystone. **Limestone**: a/a
5900	100	**Marl**: a/a
5950	100	**Marl**: a/a
6000	95 5	**Marl**: a/a **Limestone**: pale grey, yellowish-brown, firm to moderately hard, argillaceous.
6050	50 50	**Marl**: a/a **Limestone**: off-white, cream, firm to moderately hard, mudstone, chalky.
6100	100	**Claystone**: dark grey, medium grey, firm to moderately hard, calcareous, occasional nodular pyrite.
6150	100	**Claystone**: a/a
6200	100	**Claystone**: a/a
6250	90 10	**Claystone:** dark grey to medium grey, soft to moderately hard, slightly calcareous. **Dolomite**: light yellowish-grey, light brownish-grey, tan, soft to hard, mudstone, in part cryptocrystalline, dense, brittle.
6300	100	**Claystone**: a/a
6350	90 10	**Claystone**: a/a **Dolomite**: a/a
6400	80 20	**Claystone**: a/a **Dolomite**: a/a
6450	100	**Claystone**: a/a
6500	100	**Claystone**: dark grey to medium grey, firm to moderately hard, slightly calcareous.
6550	90 10	**Claystone**: a/a **Dolomite**: light yellowish-grey, light brownish-grey, tan, soft to hard, mudstone, chalky, slightly argillaceous.
6600	100	**Claystone**: a/a
6650	100	**Claystone**: dark grey to medium grey, firm to moderately hard, generally non-calcareous, occasionally slightly calcareous.
6700	95 5 Traces	**Claystone**: a/a **Dolomite**: a/a **Limestone**: off-white, cream, medium hard to hard, mudstone, chalky.

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
6750	100	**Claystone**: a/a
6800	100	**Claystone**: darkish grey to medium grey, firm to moderately hard, generally non-calcareous, occasionally slightly calcareous, slightly silty.
6850	100	**Claystone**: a/a
6900	100	**Claystone**: a/a
6950	100	**Claystone**: a/a
7000	100	**Claystone**: darkish grey to medium grey, firm to moderately hard, generally non-calcareous, occasionally slightly calcareous, slightly silty.
7050	100	**Claystone**: a/a
7100	100	**Claystone**: a/a
7150	100	**Claystone**: a/a
7200	100	**Claystone**: darkish grey to medium grey, firm to moderately hard, generally non-calcareous, occasionally slightly calcareous, slightly silty.
7250	100	**Claystone**: a/a
7300	100	**Claystone**: a/a
7350	95 5	**Claystone**: a/a **Dolomite**: light yellowish-grey, light brownish-grey, tan, soft to hard, mudstone, chalky, slightly argillaceous.
7400	90 10	**Claystone**: a/a **Dolomite**: light yellowish-grey, light brownish-grey, tan, soft to hard, mudstone, chalky, slightly argillaceous.
7450	90 10	**Claystone**: a/a **Dolomite**: a/a
7500	100	**Claystone**: a/a
7550	100	**Claystone**: a/a
7600	100	**Claystone**: a/a
7650	100	**Claystone**: darkish grey becoming medium grey, firm to moderately firm, slightly calcareous becoming moderately calcareous, slightly silty.
7700	100 traces	**Claystone**: a/a **Limestone**: light yellowish-grey, firm to moderately hard, chalky to microcrystalline, slightly silty, trace pellets / concretions.
7750	95 5	**Claystone**: a/a **Limestone**: a/a
7800	100 Traces	**Claystone**: a/a **Dolomite**: light yellowish-grey, light brownish-grey, tan, soft to hard, mudstone, chalky, slightly argillaceous.
7850	100	**Claystone**: a/a
7900	100	**Claystone**: medium grey to darkish, moderately hard to hard, slightly calcareous to occasionally moderately calcareous. Trace Calcite.
7950	100	**Claystone**: a/a
8000	100	**Claystone**: a/a
8050	100 traces	**Claystone**: a/a **Limestone**: light grey, firm, arenaceous? mudstone, argillaceous.
8100	100	**Claystone**: a/a
8150	100	**Claystone**: medium grey to darkish, moderately hard to hard, slightly calcareous to occasionally moderately calcareous, locally marly, occasionally locally silty.
8200	100 traces	**Claystone**: a/a **Dolomite**: light yellowish-grey, light brownish-grey, tan, soft to hard, mudstone, chalky, slightly argillaceous.
8250	100	**Claystone**: medium grey to darkish, moderately hard to hard, slightly calcareous to occasionally moderately calcareous, locally marly, occasionally locally silty.
8300	100	**Claystone**: a/a
8350	100	**Claystone**: a/a
8400	100	**Marl**: medium grey, darkish grey, soft to firm, moderately to highly calcareous.
8450	50 50	**Claystone**: a/a **Marl**: a/a
8500	100	**Claystone**: medium grey to darkish, moderately hard to hard, slightly calcareous to occasionally moderately calcareous, locally marly, occasionally locally silty.

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
8550	100	**Claystone**: a/a
8600	100	**Marl**: medium grey, darkish grey, soft to firm, moderately to highly calcareous.
8650	50 50 traces	**Claystone**: a/a **Marl**: a/a **QUARTZ**: clear, colourless, angular, vein ? coarse quartz with black accessory mineral.
8700	50 50	**Claystone**: medium grey to darkish, moderately hard to hard, slightly calcareous to occasionally moderately calcareous, locally marly, occasionally locally silty. **Marl**: a/a
8750	50 50	**Claystone**: a/a **Marl**: a/a
8800	100 traces	**Marl**: medium grey, darkish grey, soft to firm, moderately to highly calcareous. **QUARTZ**: clear, colourless, angular, vein ? coarse quartz with black accessory mineral.
8850	100	**Marl**: a/a
8900	100 Traces	**Marl**: a/a **Limestone**: off-white to brownish-grey, soft rock flour, arenaceous?.
8950	100	**Marl**: medium grey, darkish grey, soft to firm, moderately to highly calcareous.
9000	50 50	**Marl**: a/a **Limestone**: moderately hard to hard rock flour, light grey, cryptocrystalline, calcareous / dolomitic matrix, arenaceous?, sandy?, trace glauconite? flecks, wackestone.
9050	70 30	**Marl**: a/a **Limestone**: a/a
9100	50 40 10	**Marl**: a/a **Limestone**: a/a **Claystone**: pale green-grey, dark red-brown, firm to hard, non-calcareous.
9143	70 30	**Marl**: a/a **Claystone**: darkish grey to dark grey, moderately hard to hard, slightly to non-calcareous.
9160	100	**Claystone**: brownish grey to olive grey, greenish grey, soft to firm, plastic and sticky in places, sub-blocky to blocky, very slight to slight calcareous, slight silty.
9170	100	**Claystone**: a/a
9180	100 Traces	**Claystone**: a/a, becoming slight to moderate calcareous, calcareous in places grading marl. **Limestone**: dolomitic, mudstone, yellowish brown, dusky yellow, firm, blocky, argillaceous.
9190	100 Traces	**Claystone**: a/a **Limestone**: a/a
9200	100 Traces	**Claystone**: brownish grey, greenish grey to dark greenish grey, olive grey, predominantly firm, blocky to sub-blocky, slight calcareous, occasional moderate calcareous, rare slight silty.
9210		Missed
9220	80 10 10	**Claystone**: a/a **Sandstone**: yellowish brown, dusky yellow, very fine to silty, moderate to well sorted, angular, firm, calcareous cement, no visual porosity, shows masked by OBM, trace pyrite, trace glauconite. **Limestone**: a/a
9230	90 10	**Claystone**: a/a **Sandstone**: a/a, occasional off white to very light grey, fine to very fine, calcareous cement.
9240	100 Traces	**Claystone**: predominant greenish grey, moderate firm to firm, blocky to sub-blocky, very slight calcareous, slight micro-mica. **Limestone**: a/a
9250	100 Traces	**Claystone**: a/a, becoming less calcareous. **Limestone**: a/a
9260	70 30	**Claystone**: brownish grey to dark greenish grey, greenish grey in places, occasional reddish brown, firm, blocky to sub-blocky, non to very slight calcareous, slight micro-mica. Limestone: mudstone, light to medium grey, light greenish grey, common dark argillaceous streaks, firm, blocky to sub-blocky, micro to crypto-crystalline, argillaceous, silty in places.
9270	60 40	**Claystone**: a/a **Limestone**: a/a, light yellowish brown in places.
9280	35 35 15 15	**Claystone**: a/a, predominant medium grey to greenish grey, brownish grey. **Marl**: medium grey to greenish grey, moderate firm to firm, sub-blocky to blocky, slight to moderate silty in places. **Sandstone**: a/a **Limestone**: a/a
9290	40	**Claystone**: a/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
	30 10 20	**Marl**: a/a **Sandstone**: a/a **Limestone**: a/a
9300	100 Traces	**Claystone**: medium brownish grey to brownish grey, medium greenish grey, moderate firm to firm, blocky to sub-blocky, very slight calcareous to slight calcareous, slight to moderate silty in places.
9310	90 Traces 10	**Claystone**: a/a **Sandstone**: a/a **Limestone**: a/a
9320	85 5 10	**Claystone**: a/a **Sandstone**: a/a **Limestone**: a/a
9330		missed
9340	90 Traces 10	**Claystone**: medium grey to medium greenish grey, medium brownish grey, moderate firm to firm, blocky to sub-blocky, slight calcareous, slight micro-mica, slight silty in places. **Sandstone**: a/a **Limestone**: a/a
9350	90 10	**Claystone**: a/a Limestone: mudstone, predominant light to medium grey and greenish grey, firm, blocky, micro to crypto-crystalline, argillaceous in places, occasional argillaceous/ carbonaceous laminations.
9360	60 40	**Claystone**: a/a **Limestone**: a/a
9370		missed
9380	95 5	**Claystone**: a/a, slight to moderate calcareous. Also (30%): reddish brown, firm, blocky to sub-blocky, non to slight calcareous.
9390	70 30	**Claystone**: a/a. Also (40%): reddish brown **Limestone**: mudstone, varicoloured, light grey-off white, light yellowish brown, cream, firm, sub-blocky to blocky, micro to crypto-crystalline, argillaceous in places, dark argillaceous laminations.
9400	50 50	**Claystone**: a/a. Also (20%): reddish brown. Limestone: a/a
9410	60 40	**Claystone**: medium grey to medium greenish grey, occasional dark grey to dark brownish grey, firm to moderate firm, sub-blocky to blocky, slight to moderate calcareous, occasional calcareous grading marl, non calcareous when dark, slight micro-mica. **Limestone**: a/a
9420		missed
9430	60 40	**Claystone**: a/a, less reddish brown **Limestone**: dolomitic in places, mudstone, varicoloured, light yellowish brown to dusky yellow, pale brown, light grey in places, firm, occasional moderate hard to hard, blocky to sub-blocky, micro to crypto-crystalline, argillaceous streaks in places.
9440	100 Traces	**Claystone**: a/a. Also traces reddish brown. **Limestone**: a/a
9450	10 80 10	Claystone: a/a **Marl**: medium grey to medium greenish grey, soft to firm, plastic and sticky in places, sub-blocky to blocky **Limestone**: a/a
9460	10 80 10	**Claystone**: a/a Marl: a/a **Limestone**: a/a
9470	10 90 Traces	**Claystone**: a/a **Marl**: a/a **Limestone**: a/a
9480	Traces 90 10	**Claystone**: brownish-grey, greenish-grey, firm, sub-blocky to blocky, non to very slight calcareous, slight micro-mica. **Marl**: a/a **Limestone**: mudstone, predominant pale brown, firm, blocky, crypto-crystalline, argillaceous.
9490		missed
9500	30 70	**Claystone**: a/a, slight to moderate calcareous. Also traces reddish-brown. **Marl**: a/a
9510	20 80	**Claystone**: a/a, slight to moderate calcareous. Also traces reddish-brown. **Marl**: a/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
9520	40 60	**Claystone**: a/a, rare trace pyrite. **Marl**: a/a
9530	20 60 20	**Claystone**: a/a **Marl**: a/a **Limestone**: mudstone, predominantly pale brown, firm, blocky, crypto- to crystalline, argillaceous.
9540	90 10	**Marl**: medium grey to medium greenish-grey, firm, plastic and sticky in places, sub-blocky to blocky, slight micro-mica. **Limestone**: a/a
9550		missed
9560	10 90	**Claystone**: brownish grey to dark grey, medium dark greenish grey, firm, blocky to sub-blocky, slight to moderate calcareous, slight micro-mica. **Marl**: a/a
9570	50 50 trace	**Claystone**: light to medium grey, occasionally pale greenish-grey to green-grey, dark grey, soft to firm, variably calcareous, occasionally silty, locally Marly. **Marl**: a/a **Limestone**: traces, cream, soft, mudstone to wackestone, chalky to microcrystalline.
9580	70 30 trace	**Claystone**: a/a **Marl**: a/a **Limestone**: a/a
9590	70 30 trace	**Claystone**: a/a **Marl**: a/a **Limestone**: a/a
9600	70 30 trace	**Claystone**: a/a **Marl**: a/a **Limestone**: a/a
9610	missed	
9620	90 10 trace	**Claystone**: light to medium grey, pale green-grey, medium to dark grey, occasionally dark grey, soft to occasionally hard (dark grey - non hygroscopic), variably calcareous, occasionally silty, locally Marly. **Marl**: a/a **Limestone**: a/a
9630	70 30 trace	**Claystone**: a/a **Marl**: red-brown, soft, variably calcareous. **Limestone**: a/a
9640	20 80	**Claystone**: a/a **Marl**: a/a
9650	30 70	**Claystone**: a/a **Marl**: a/a
9660	30 65 5	**Claystone**: a/a **Marl**: a/a **Limestone**: a/a
9670	80 20	**Claystone**: light to medium grey, grey-brown, brown, dark grey to black, non to variably calcareous. **Marl**: a/a
9680	10 20 70	**Claystone**: a/a **Marl**: a/a **Limestone**: cream, off white to light grey, mudstone, soft to hard, cryptocrystalline, chalky in part, locally Marly, trace Pyrite.
9690	20 10 70	**Claystone**: a/a **Marl**: a/a **Limestone**: a/a
9700	70 10 20	**Claystone**: a/a **Marl**: a/a **Limestone**: a/a
9710	70 30	**Claystone**: a/a **Limestone**: a/a
9720	90 10 traces	**Claystone**: a/a **Limestone**: a/a **Claystone**: dark blackish-brown, firm to moderately hard, non-calcareous.
9730	50	**Claystone**: light to medium grey, grey-brown, brown, dark grey to black, non to variably calcareous.

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
	50	**Claystone**: dark blackish-brown, firm to moderately hard, non-calcareous. Shows: no direct fluorescence; dull pale green-yellow cut fluorescence.
9740	30 70	**Claystone**: a/a **Calcareous Sandstone**: rock flour, pale grey to white, soft (crushed), slightly argillaceous, calcareous matrix, possibly silty to very fine grained. No HC shows - dull grey-white mineral fluor, feint green-yellow cut fluor.
9750	50 50	**Claystone**: a/a **Sandstone**: a/a
9760	missed	
9770	70 30	**Claystone**: a/a **Sandstone**: a/a
9780	missed	
9790	70 30	**Claystone**: a/a **Sandstone**: a/a
9800	30 70	**Claystone**: a/a **Sandstone**: a/a
9810	100	**Sandstone**: a/a
9820	80 20	**Claystone**: a/a **Sandstone**: a/a
9830	70 30	**Claystone**: a/a **Sandstone**: a/a
9840	90 10	**Claystone**: a/a **Sandstone**: a/a
9850	90 10	**Claystone**: a/a **Sandstone**: a/a, trace Glauconite.
9860	Missed	
9870	60 40	**Claystone**: dark black-brown, firm to hard, non calcareous. **Sandstone**: rock flour, white, grey-white, occasional dark streaks, soft (crushed), slightly to locally variably argillaceous, calcareous matrix, possibly silty to very fine grained, occasional medium to coarse grains. (Baracarb in mud). No HC shows - dull grey-white mineral fluor, feint green-yellow cut fluor.
9880	45 55	**Claystone**: a/a **Sandstone**: a/a
9890	90 10	**Claystone**: a/a **Sandstone**: a/a
9900	90 10	**Claystone**: a/a **Sandstone**: a/a
9910	90 10	**Claystone**: a/a **Sandstone**: a/a
9920	90 10	**Claystone**: a/a **Sandstone**: a/a
9930	95 5	**Claystone**: a/a **Sandstone**: a/a
9940	100	**Claystone**: a/a
9950	95 5	**Claystone**: a/a **Sandstone**: a/a
9960	100 Trace	**Claystone**: a/a **Sandstone**: a/a
9970	Missed	
9980	100 Trace	**Claystone**: a/a **Sandstone**: a/a
9990	100 Trace	**Claystone**: a/a **Sandstone**: a/a
10000	100 Trace	**Claystone**: a/a **Sandstone**: a/a
10010	100 Trace	**Claystone**: a/a **Sandstone**: a/a
10020	100 trace	**Claystone**: a/a **Sandstone**: a/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
10030	95 5	**Claystone**: a/a **Sandstone**: a/a
10040	95 5	**Claystone**: a/a, dark black-brown, firm to hard, non calcareous; with traces medium grey, soft, non calcareous. **Sandstone**: a/a
10050	Missed	
10060	95 5	**Claystone**: a/a **Sandstone**: white, very pale greenish-grey, firm, traces clear quartz sand, very fine to fine, subangular to subrounded, good sorting, quartz matrix – probably flour, no visual porosity.
10070	100 Trace	**Claystone**: a/a **Sandstone**: a/a
10080	100 Trace	**Claystone**: a/a **Sandstone**: a/a
10090	95 5 traces	**Claystone**: a/a, with traces Pyrite. **Sandstone**: a/a **Siltstone**: dark blackish-brown, hard.
10100	95 5	**Claystone**: a/a **Sandstone**: a/a
10110	80 5 15	**Claystone**: dark grey to dark brownish grey, brownish black, firm to friable, blocky to sub-blocky, non calcareous, moderately silty in places, carbonaceous. Also: rare reddish-brown (cavings / old cuttings), firm, blocky, variably calcareous to marly. **Siltstone**: reddish-brown to moderate brown, greenish-grey in places, friable, blocky, argillaceous, grading to very fine sandstone in places. **Sandstone**: off-white, very light grey to light greenish-grey, very pale orange, commonly rock flour, very fine, moderate sorted, sub-rounded, friable, moderate calcareous cement, poor to moderate visual porosity, shows obscured by OBM: bright yellow-yellowish brown mineral/OBM direct fluorescence, moderate stream yellowish white cut fluorescence.
10120	75 Traces 25	**Claystone**: a/a. Also rare reddish-brown 9cavings / old cuttings) **Siltstone**: a/a **Sandstone**: a/a, shows obscured by OBM: bright yellow-yellowish brown mineral/OBM direct fluorescence, moderate patchy streaming yellowish white cut fluorescence.
10125 BU	75 Traces 25	**Claystone**: a/a. Also rare reddish brown **Siltstone**: a/a **Sandstone**: a/a, carbonaceous streaks in places, poor to good visual porosity, shows obscured by OBM: bright yellow-yellowish brown mineral/OBM direct fluorescence, fast streaming yellowish white to white cut fluorescence.
10146 BU	90 10	**Claystone**: a/a **Sandstone**: a/a, predominant as rock flour *Samples below 10100ft MD to 10146ft MD not representative due to mud losses occurred, intermittently circulations, alternated pump rates, pumped LCM, bit trip.*
10150		Sample heavily contaminated with LCM
10160	20 80	**Claystone**: a/a. Also rare reddish brown Sandstone: off white-very light grey, rarely medium grey, common rock flour, very fine to fine, moderate to well sorted, friable, slight to moderate calcareous cement, common dark argillaceous streaks, poor to moderate visual porosity, shows: dull grey to dull yellowish grey mineral/OBM fluorescence, moderate patchy streaming yellowish to yellowish white cut fluorescence.
10170	30 70	**Claystone**: dark grey to dark brownish grey, brownish black, firm, non calcareous, silty in places, carbonaceous. **Sandstone**: a/a, shows: a/a
10180	20 80	**Claystone**: a/a **Sandstone:** a/a, shows: dull yellowish grey to dull yellow mineral/OBM fluorescence, slow streaming yellowish to yellowish blue cut fluorescence.
10186.5 spot	40 60	**Claystone**: a/a **Sandstone**: a/a, predominant as rock flour, fine disseminated pyrite in places.
10190	20 40	**Claystone**: a/a **Siltstone**: brown to dark brown, soft rock flour, silt to very fine sized grains, highly argillaceous. No direct fluorescence; dull yellow-green cut fluorescence (OBM). Also **Siltstone**: medium grey to medium brownish grey, soft to friable, blocky, non calcareous, argillaceous matrix, common

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
		carbonaceous streaks.
	40	**Sandstone**: a/a, shows: dull yellowish grey to dull yellow mineral/OBM fluorescence, slow streaming yellowish blue cut fluorescence. Also: medium grey, medium brownish grey, very fine to fine, moderate sorted, sub-angular to sub-rounded, friable, argillaceous matrix, no visual porosity.
	20	**Claystone**: black-brown, occasionally green-grey, medium hard to hard, non-calcareous; from dark claystone, no direct fluorescence; dull yellow-green cut fluorescence.
	40	**Siltstone**: brown to dark brown, soft rock flour, silt to very fine sized grains, highly argillaceous. No direct fluorescence; dull yellow-green cut fluorescence (OBM).
10200	40	**Sandstone**: predominantly as rock flour, white to cream, occasional floating silt to very fine grains, variably calcareous grading to sandy Limestone?, locally pale green (glauconitic), calcareous, rare pyrite; occasional sandstone fragments, clear, colourless quartz, fine to medium, subangular to subrounded, very well cemented, siliceous and calcareous cement, no visual porosity. Dull grey direct fluorescence, dull yellow-green cut fluorescence (OBM).
	80	**Claystone**: a/a
10210	10	**Siltstone**: a/a
	10	**Sandstone**: a/a
	80	**Claystone**: a/a
10220	Trace	**Siltstone**: a/a
	20	**Sandstone**: a/a
	30	**Claystone**: a/a
10230	10	**Siltstone**: a/a
	60	**Sandstone**: a/a
	40	**Claystone**: a/a
10240	10	**Siltstone**: a/a
	50	**Sandstone**: a/a
10250	10	**Claystone**: a/a
	90	**Sandstone**: a/a
10260	10	**Claystone**: a/a
	90	**Sandstone**: a/a
	20	**Claystone**: a/a
	40	**Siltstone**: a/a
10270	40	**Sandstone**: rock flour, white, off-white, cream, soft to firm, highly calcareous grading to sandy? Limestone, occasional floating silt to very fine grains, rare pyrite; occasionally pale to dark green-grey & glauconitic. Dull grey direct fluorescence, dull yellow-green cut fluorescence (OBM).
	20	**Claystone**: a/a
10280	80	**Sandstone**: a/a
		Abundant LCM in sample – from header box?
	20	**Claystone**: pale grey, soft, grading from siltstone.
10290	60	**Siltstone**: medium grey to locally darkish grey, firm to moderately hard, very finely sandy in part,
	20	highly argillaceous, non-calcareous, occasionally glauconitic.
		Sandstone: a/a
	10	**Claystone**: a/a
10300	70	**Siltstone**: a/a
	20	**Sandstone**: a/a
10310	80	**Siltstone**: dark brown, a/a
	20	**Sandstone**: a/a
	10	**Claystone**: a/a
10320	70	**Siltstone**: a/a
	20	**Sandstone**: a/a
10330	70	**Siltstone**: a/a
	30	**Sandstone**: a/a
	80	**Siltstone**: dark brown to black-brown, soft to firm to moderately hard, non-calcareous, with loose
10340		quartz, clear, colourless, medium to very coarse & occasional very coarse, angular to well rounded, rare coarse quartz sandstone, slightly calcareous, very hard. OBM shows, as above.
	20	**Sandstone**: a/a
	20	**Claystone**: a/a
10320	30	**Siltstone**: a/a
	50	**Sandstone**: a/a
10330	30	**Claystone:** a/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
	20 50	**Siltstone**: brownish grey to dark grey, medium grey and medium brown in places, soft to friable, blocky, argillaceous, moderate calcareous, carbonaceous in places, grading very fine argillaceous sandstone in places. **Sandstone**: off white to very light grey, cream in places, common as rock flour, rarely clear , coarse, angular to rounded loose quartz grains, very fine to fine, moderate to well sorted, sub-angular to sub-rounded, firm-friable, moderate calcareous cement, carbonaceous streaks in places, generally poor visual porosity, shows: dull grey to dull yellowish grey mineral/OBM fluorescence, slow streaming yellowish blue cut fluorescence.
10340	20 20 60	**Claystone**: a/a **Siltstone**: a/a **Sandstone**: a/a. Also: medium grey to medium brownish grey, common very fine to silt, fine in places, poor to moderate sorted, sub-angular to rounded, soft-friable, argillaceous matrix, moderate calcareous, common carbonaceous, grading silty sandstone, shows: dull yellowish grey to dull yellowish brown mineral/OBM direct fluorescence, slow to moderate streaming yellowish brown to yellowish blue cut fluorescence.
10350	50 50	Siltstone: a/a, argillaceous, slightly to moderately calcareous, grading very fine sandstone Sandstone: a/a, argillaceous matrix, grading silty sandstone, shows: dull yellowish brown direct fluorescence, slow patchy streaming yellowish white cut colour. LCM contamination
10355	50 50	Siltstone: a/a, argillaceous, slightly to moderately calcareous, grading very fine sandstone Sandstone: a/a, argillaceous matrix, grading silty sandstone, shows: dull yellowish brown direct fluorescence, slow patchy streaming yellowish white cut colour. LCM contamination
10361	70 30	Siltstone: a/a Sandstone: a/a LCM contamination *Samples below 10340ft MD to 10361ft MD not representative due to influx occurred, stop circulation (shut-in well), circulation at reduced pump rate,.*

7. WIRELINE LOGGING OPERATIONS

Run #	Logging tools	Interval (ft)	Logging Date
	Wireline logging operation was cancelled.		