STERLING RESOURCES (UK) LTD

WELL: 210/30a-4 Cladhan

APPRAISAL

WELLSITE GEOLOGICAL REPORT

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1 INTRODUCTION

The Cladhan 210/30a-A4 well is planned as a deviated appraisal well located in Quad/Block 210/30a of the Northern North Sea.

The Cladhan accumulation is located in the NW of the East Shetland Basin against the East Shetland Platform approximately 20 km from the South Cormorant platform and 150 km from the Sullom Voe oil terminal. The prospect comprises a stratigraphic trap of slump/channel sandstones of Late Oxfordian to Late Kimmeridgian age, pinching out within the Kimmeridge Clay Formation.

The Cladhan reservoir has been penetrated by three previous wells 210/29a-4 in 2008 and subsequent sidetracks 210/29a-4Z and 4Y in 2010.

The Cladhan reservoir sands lie within the Kimmeridge Clay Formation. These isolated sands display characteristic slumps and channels indicative of deposition over the slope and terraces immediately east of the East Shetland Platform boundary fault line and consist of three channel belts with a potential fan complex. They lie adjacent to a relay ramp that links a series of down to the east normal faults into the basin area. The interpreted mapping of the channel sands has been aided by Mu-Rho seismic amplitude extractions that have been calibrated to existing well data. The sands pinchout laterally and updip and are encased in the black shales and claystones of the Kimmeridge Clay Formation.

The source of the hydrocarbons is from the encasing Kimmeridge Clay black shales. The prospect is adjacent to, and along trend from the Tern and South Cormorant Fields, for which the Kimmeridge source is an effective source.

Three channel belts have been broadly mapped over the terrace slope area with a potential fan complex identified at the base of the relay ramp. The 210/30a-4 well will target the Sequence 1 reservoir sands within the Kimmeridge Clay Formation in the northern channel belt which is down dip from the existing appraisal wells in an area of interpreted thickening of the reservoir sands due to amalgamation. The primary objective is to establish hydrocarbon sands down-dip of the previous well locations and if possible, establish an OWC for the Cladhan accumulation.

Reservoir distribution and quality is controlled by the presence of turbidite channel and fan lobe sands together with the presence of calcite cement. The presence of calcite cement is an important consideration for reservoir character. Two sand intervals have been encountered in the 210/29a-4 discovery well (Sequence 2A/2B) which were tightly cemented. These sands are not expected at this location.

The proposed target coordinates for the well at the top of Sequence 1 (deep prognosis) is
Latitude 61deg 07' 59.86" N
Longitude 00deg 48' 45.77" E

The well was planned as a deviated well with a target tolerance of 75 ft radius centered on the planned target position. There is an error margin of +/- 150 ft TVDSS on the prognosed top of Sequence 1. Last active survey at 12187 ft MDBRT showed: inclination 44.09^{o}, azimuth 7.87^{o}, TVDBRT 10636.53 ft (-10563.53 ft TVDSS). A maximum inclination of 46.62^{o} was recorded at 8715 ft MDBRT.

The well TD was prognosed at -10628 ft TVDSS which was anticipated to be +/- 150 ft MD below the base of the Sequence 1 into the underlying Kimmeridge/ Heather Formation. The base of the Sequence 1 was intersected at 12095 ft MD (-10498ft TVDSS). The well reached TD of 12252 ft (-10610.46 ft TVDSS) on 6th of April 2011.

1.1 Primary Objectives

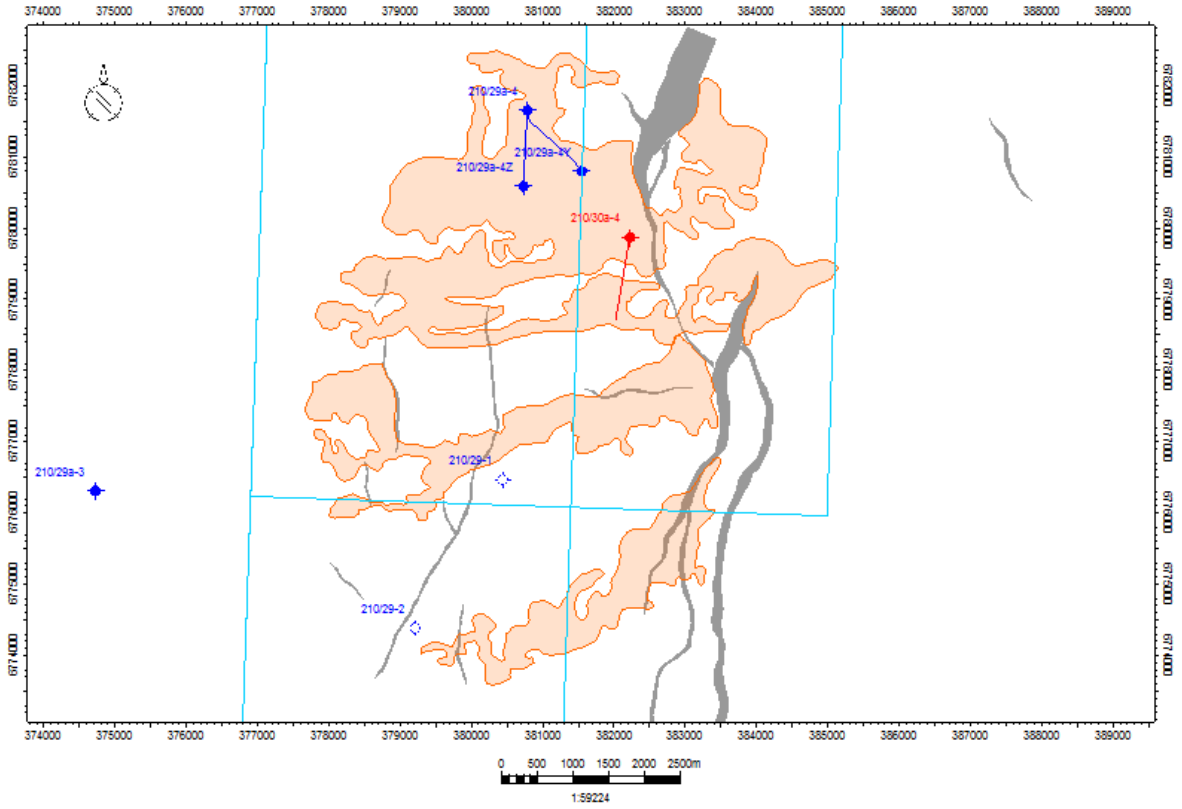
- Drill the well with no recordable accidents and environmental incidents. Establish the presence of hydrocarbon bearing sands down dip of the present well penetrations
- Acquire core across as much of the Cladhan reservoir interval as possible
- Acquire MDT data, both pressure and sample points, across any sand intervals encountered in the Kimmeridge Clay Formation regardless of fluid type encountered
- The well will be drilled and suspended such that the upper hole sections can be reused at a later date
- The coring point will be picked on encountering hydrocarbon bearing sands within the Kimmeridge Clay Formation
- A Near Bit resistivity tool must be included in the LWD suite while drilling the Kimmeridge Clay Formation to aid the picking of the coring point
- LWD logs will be run as a minimum data acquisition requirement and will include GR, Density, Neutron, Resistivity and Sonic (including shear)
- The TD of the well must allow all logging sondes to pass below any recorded hydrocarbon bearing formation

1.2 Secondary Objectives

- If possible, establish an OWC for the Cladhan accumulation
- A reduced core dataset will be required in water bearing sands if no oil bearing formation is encountered
- Side wall cores maybe required if the conventional coring programme fails to be met or if an uncored section is deemed worthy of sampling

2. LOCATION MAP

The 210/30a-4 well is located on the Cladhan discovery on Quad/Block 210/30a in the NW of the East Shetland Basin (UK offshore Northern, North Sea) against the East Shetland Platform approximately 20 km from the South Cormorant platform and 150 km from the Sullom Voe oil terminal.



3. WELL DATA SUMMARY

Well:	210/30a-4
Pre-spud designation:	Drill a deviated well within a target tolerance of 200 ft radius to establish the presence of hydrocarbons in the Cladhan reservoir down dip of previous drilled wells. A core is to be acquired across as much of the Cladhan reservoir as possible and further evaluation of the reservoir with logging tools, formation pressures and fluid samples to be taken.
Well Type:	Deviated Appraisal
Operator:	Sterling Resources
Location:	UK offshore-Northern North Sea
Basin Name:	East Shetland
Prospect:	Cladhan
Quad/Block:	210/30a
Equity:	Sterling Resources (UK) Ltd: 39.9% Wintershall (UK North Sea) Ltd: 33.5% Encore Oil & Gas Ltd: 16.6% Dyas: 10%
Surface Location:	Latitude: 61° 07’ 26.045” N Longitude: 00° 48’ 35.936” E X UTM: 382 022.11 m E Y UTM: 6 778 723.84 m N Datum (MSL): ED 1950, UTM Zone 31E, Spheroid International 1924
Bottom Hole Coordinates	Latitude: 61° 08’ 03.800”N Longitude: 00° 48’ 46.668”E X UTM: 382,221.70m E Y UTM: 6,779,886.23m N
Target Formation:	Kimmeridge Clay Formation (Sequence 1)
Rig:	Prospect
Rig Contractor:	Transocean
RT-MSL:	73 ft
RT-SEABED:	574 ft
Water depth:	501 ft
Spud date:	28th February 2011
TD Reached:	7th April 2011
Total depth:	12252 ft MDBRT (-10610.45 ft TVDSS)

HOLE SIZE and CASING DATA

Hole Size (in)	Depth (ft MD)	Casing Shoe (ft MD)	Casing Diam (in)	Properties ppf/wall/grade
26" x 36"	842	813	30"	310/1"/X52 & 456/1.5"/X56
26"	2633	2572	20"	133/0.6875/X56
17 ½"	6036	6015	13 3/8"	72/0.5625/L80
12 ¼"	12252			

BIT DATA

Bit Run	Type	Size (in)	Depth in (ft)	Depth out (ft)	Footage (ft)
1	Security DBS (Mill Tooth)	26"	574	842	268
2	Security XR+VEJ3C (Mill Tooth)	20"	842	2633	1791
3	Hughes Christensen MXL-T00 (TCI)	17 ½"	2633	6036	3403
4	Varel VB613GNUXS3 (PDC)	12 ¼"	6036	11554	5518
5	Hughes Christensen core BHC607	12 ¼"	11554	11644	166
6 (rr 4)	Varel VB613GNUXS3 (PDC)	12 ¼"	11644	11720	68
7	Smith GF15BDODV (TCI)	12 ¼"	11720	11870	150
8	Smith GF15BDODVCPD (PDC)	12 ¼"	11870	11252	618

MUD SYSTEM: MI SWACO

Depth ft	MW ppg	FV s/q	PV/YP @120^{0}F	GELS @120^{0}F lb/100ft^2	HTHP Filtrate cc/30'	HTHP Cake in/32	Corrected Solids % Vol	ESV mV	Oil/Water Ratio %
36" Hole section drilled with seawater									
Pumped 50 bbl Bentonite sweeps pumped mid stand.									
26" Hole section drilled with seawater									
Pumped 50bbl Guar gum sweeps mid stand and 50bbl Bentonite sweeps prior to connections.									
17 ½" hole section drilled with VERSACLEAN OBM type									
Depth ft	MW ppg	FV s/q	PV/YP @120^{0}F	GELS @120^{0}F lb/100ft^2	HTHP Filtrate cc/30'	HTHP Cake in/32	Corrected Solids % Vol	ESV volts	Oil/Water Ratio %
3142	9.2	74	19/28	17/19	2.2	1	7.69	401	68/32
4432	9.5	69	19/29	18/20	1.8	1	9.33	460	66/34
4852	9.65	67	20/29	19/21	2.0	1	10.23	531	67/33
6036	9.95	63	20/30	19/22	2.2	1	11.1	601	67/33
12 ¼" Hole Section drilled with VERSACLEAN OBM type									
Depth ft	MW ppg	FV s/q	PV/YP @120^{0}F	GELS @120^{0}F lb/100ft^2	HTHP Filtrate cc/30'	HTHP Cake in/32	Corrected Solids % Vol	ESV volts	Oil/Water Ratio %
6720	10.05	57	18/27	15/17/20	2.6	2	11.7	673	68/32
7600	10.1	49	17/26	15/16/16	3.2	2	11.4	781	71/29
8400	11	52	19/28	17/22/23	2.4	2	17	703	71/29

9100	11	54	22/30	18/23/24	2.8	2	16.4	766	71/29
10200	11.35	54	24/32	20/24/26	3.0	2	11.2	753	72/28
11300	12.4	53	24/33	18/23/24	3.8	2	21.4	699	73/27
11554	12.45	55	24/31	17/22/23	2.8	2	20.4	701	73/27
11644	12.75	63	26/29	17/21/23	3	2	23.44	700	73/27
11750	12.65	57	26/29	19/22/23	2.8	2	23.44	709	73/27
11850	12.65	58	27/29	17/22/23	2.8	1	23.44	753	73/27
11870	12.65	55	25/29	17/19/21	2.5	2	21.45	727	73/27
12100	12.65	56	27/27	15/19/21	2.5	2	21.97	776	73/27
12150	12.65	54	27/29	16/20/21	2.9	2	22.51	742	74/26
12252	12.65	60	27/29	16/20/21	2.9	2	22.51	753	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/ GR Pathfinder/Sonic	594 – 744 11870 - 12252	28/02/11 01/03/11	Good run. Unable to download recorded data from tool.
26"	2	Navigamma/ GR	744 – 2571	03/03/11 05/03/11	Good run. Unable to download recorded data from tool.
17 ½"	3	Navigamma/ GR	2571 – 5967	10/03/11 15/03/11	Good run. 3ft gap in real-time data. Unable to download recorded data from tool.
12 ¼"	4	Zonetrak-NBG-OntrakII/ At bit Res-Near bit GR-MWDGR	5967 – 11510	19/03/11 27/03/11	Generally good run. A discrepancy in data between the MWD GR and the near bit sensors at 11473 ft MD. Operator error.
12 ¼"	5	Zonetrak-NBG-OntrakII/ At bit Res-Near bit GR-MWDGR	11460 – 11676	30/03/11 31/03/11	Good Run.
12 ¼"	6	Zonetrak-NBG-OntrakII/ At bit Res-Near bit GR-MWDGR	11676 – 11826	01/04/11 04/04/11	Good Run
12 ¼"	7	Ontrak II-ORD-CCN/GR-Res_POR-DEN-CAL	10946 -12198	04/04/11 06/04/11	Good run. Re-Logged drilled section from 10946 – 11644ft MD. 6 ft depth discrepancy observed on re-logging once bit back on bottom.

WIRELINE LOGGING: BHI – Baker Atlas

Hole Size (in)	Run no.	Tools Run	Interval Logged (ft)	Date In-Out	Comments
12 ¼"	#1a	SLAM-XMAC-FLEX	6012 - 12239	06-07/04/11	GR to surface
12 ¼"	#1b	EI-GR	11320 - 12120	08-09/04/11	800 ft recorded
12 ¼"	#1c	MREX-GR	12118-11919 / 11871-11320	09-10/04/11	48 ft gap in recorded data due to hole problems encountered.
12 ¼"	#1d	RCI-GR	11549-12084	10-11/04/11	Pretests: 39 total-12 Good, 25 Tight, 2 Aborted Fluid sampling: 3 bottles (840cc)x2 per depth

Logs witnessed by Gaia Earth Sciences Ltd specialist

CUTTINGS SAMPLES

Hole Section	Washed & Dried Samples	Bulk Wet Samples	Sample Interval
17 ½" section (from first returns)	2	2	50 ft composite sample
12 ¼" section to TD	2	2	20 ft composite sample

See *APENDIX A: 210_30a-4_Samples Shipping Manifest_BHI*

SAMPLE DESTINATIONS:

One Set to be sent to:

British Geological Survey
NGDC,
Kingsley Dunham Centre,
Keyworth,
Nottingham,
NG12 5GG
Contact: Scott Renshaw

Tel: 0115 9363 228

All Other Sets to be sent to:

CORPRO
Muirtonside
Whitecairns
Aberdeenshire
AB23 8UP
Contact: Dick Patterson

Tel: (+ 44) (0)1651 863000

Email: ops@corpro.co.uk

Core to be sent to:

Core Laboratories (U.K.) Ltd
Howe Moss Drive,
Kirkhill Industrial Estate
Dyce,
Aberdeen
AB21 0GL
Contact: Andy Dunk

Office Tel: (+ 44) (0)1224 421035

Email: Andy.Dunk@corelab.com

RCI Fluid Sample to be sent to:

Core Laboratories (U.K.) Ltd
Howe Moss Drive,
Kirkhill Industrial Estate
Dyce,
Aberdeen
AB21 0GL
Contact: Ewan Thomson

Tel: (+ 44) (0)1224 421000

Email: Ewan.Thomson@corelab.com

4. FORMATION TOPS

Picked up on field based on cuttings examination/gas shows/MWD/wireline (SLAM+XMAC+FLEX)

Wellsite Tops (provisional only)	Prognosis		Uncert.	Actual		Difference
	MDRT (ft)	TVDSS (ft)	+/- (ft)	MDRT (ft)	TVDSS (ft)	TVDRT (ft) -high /+ low
RT	0	+80	0	0	+73	-7
Seabed-Recent/Eocene Undifferentiated	585	-505	0	574	-501	-4
Eocene Balder formation	3825	-3745	50	3808	-3735	-10
Palaeocene Lista Formation	-	-	-	3975.5	-3902.5	
Late Cretaceous Undifferentiated	5485	5405	50	5530	-5457	+52
Early Cretaceous Undifferentiated	9864	-8951	150	9740	-8855	-96
Jurassic Kimmeridge Clay formation	11025	-9761	100	11085	-9791	+30
Sequence 2B				11549.35	10115	
Base Sequence 2B				11570	10129	
Sequence 1 (Shallow)	11594	-10158	150			
Sequence 1 (Deep)	11662	-10205	150	11826	-10309	+104
Base Sequence 1	12098	-10510	150	12097	-10499	-11
TD	12267	-10628		12252	-10610	-18

5. LITHOSTRATIGRAPHY

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

Lithological descriptions from 2633 ft (first returns) to TD at 12252 ft MD are based on cutting samples examined at the wellsite. Samples were collected as follow:

- 50 ft intervals from 2633 ft to 6036 ft – 17 ½" section
- 20 ft intervals from 6036 ft to 12252ft – 12 ¼" section

Formation tops on the lithology log were picked on MWD logging tool responses and cuttings examination along with gas shows. The tops were revised on the composite log as a result of wireline logging operations depth control and tool responses.

RECENT - EOCENE
Undifferentiated

574 – 3808 ft MD
501 – 3735 ft TVDSS

The top of the section comprised a mixed sequence of sandy claystones grading to argillaceous sandstone, sand and claystone with rare gravel at the top of the sequence. The formation graded to mainly monotonous claystone with minor limestone and sandstone. The limestone stringers although thin were relatively hard causing the rate of penetration to decrease. In order to reduce the risk of washing out the claystone above the limestones the flow rate was reduced whilst drilling out the limestones.

Sand:	at the top of the section was recovered as loose quartz pebbles, opaque, angular with common coarse fractured shell fragments. Graded to quartz / feldspar, generally colourless, transparent, opaque, orange, yellow, grey, fine to medium grained, sub-rounded, sub-spherical, well sorted, occasional amorphous clay interpreted as matrix, good to moderate inferred porosity, common glauconite, trace mica, rare coarse shell fragments. No Show.
Sandy Claystone:	brown grey to medium dark grey, soft, sub-blocky, generally non calcareous, locally calcareous, common with locally abundant fine to medium sand grains grading to argillaceous sandstone, common glauconite, trace mica, rare coarse shell fragments.
Claystone:	medium dark to dark grey, firm, sub-blocky to blocky, silty earthy texture, generally non calcareous, locally calcareous, trace glauconitic, trace fine sand grains,

trace mica, trace carbonaceous flecks, rare nodular pyrite, rare red orange flecks.

Limestone: Mudstone; off white, mottled grey, light brown, moderately firm, blocky, chalky texture, slightly argillaceous, micro-crystalline, argillaceous in parts, no visible porosity. No Show.

EARLY EOCENE
Balder Formation 3808 – 3975.5 ft MD
3735 – 3902.5 ft TVDSS

The formation top was picked on a step down in gamma log response and the introduction of tuffaceous material. The Balder comprised of claystone with discrete tuffs.

Claystone: medium dark to dark grey, medium grey to medium blue grey, firm, sub-blocky to blocky, silty earthy texture, non calcareous, trace glauconite, micro-micaceous, trace carbonaceous flecks.
Grading to medium grey, grey brown, soft to moderately firm, sub blocky to blocky, silty earthy texture with very fine sand grains included, non calcareous locally moderately calcareous, trace glauconite, micro-micaceous, trace red brown flecks.

Tuff: light blue to green grey, speckled dark blue green, black and red brown flecks, soft, friable, amorphous, gritty texture, non calcareous, trace glauconite, trace very fine crystalline grains.

PALAEOCENE
Lista Formation? 3808 – 3975.5 ft MD
3735 – 3902.5 ft TVDSS

The formation top was picked on the low side of a gamma feature at the base of the Balder Formation. The formation comprised mainly of monotonous claystone with frequent limestone and infrequent sandstone stringers. The limestone stringers although thin were relatively hard causing the rate of penetration to decrease significantly. In order to reduce the risk of washing out the claystone above the limestone the flow rate was reduced whilst drilling out the limestones.

Claystone: mainly dark grey brown to brown black, occasional medium dark grey, trace medium grey to medium blue grey, trace blue green grey, firm, blocky, silty earthy texture with very fine sand grains included (decreasing

with depth), generally non calcareous, moderately calcareous in places, micro-micaceous, trace glauconite, trace carbonaceous flecks at the top of the section.
At the base of the formation recovered as light green grey, moderately firm, sub-blocky, homogeneous, very calcareous.

Limestone: Mudstone; cream, light brown grey, off white to light grey, soft to moderately firm, sub-blocky to amorphous, brittle in parts, chalky texture, micro-crystalline, slightly argillaceous, trace very fine sand inclusions, no visible porosity. No Show

Sandstone: clear, light grey, cream in parts, occasionally mottled black & orange, firm, friable, weakly cemented with calcite cement, also recovered as loose quartz, generally colourless, transparent, opaque, orange, yellow, grey, very fine to fine grained, sub-rounded, sub-spherical, well sorted, poor inferred porosity, trace glauconite. No Show.

Depth Interval ft MD	**BACKGROUND GAS**									
	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
Recent - Eocene: Undiff.	ROP: min/max/avg – 15/295/118									
574 - 3825	0.04	0.31	0.12	398	0	0	0	0	0	0
Early Eocene: Balder Fm	ROP: min/max/avg – 99/211/148									
3825 - 3975	0.06	0.11	0.09	509	0	0	0	0	0	0
Palaeocene: Lista Fm	ROP: min/max/avg – 50/233/140									
3975 - 5530	0.04	0.63	0.32	2216	0	0	0	0	0	0

Depth ft MDRT	**GAS PEAKS**									
	Background %	Max %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm	Type
none										
FG=Formation gas, CG=Connection gas, TG=Trip gas, STG=Short trip gas, SW=Swab gas, POG=Pumps off gas										

LATE CRETACEOUS
Undifferentiated

5530 – 9740 ft MD
5457 – 8858 ft TVDSS

The Late Cretaceous was picked midway on a decreasing gamma log trend which coincided with low rates of penetration and a massive chalky limestone. The section comprised of monotonous claystones with minor limestone and dolomite

throughout. The top of the section is marked by a massive chalky limestone and the introduction of calcareous claystones. The upper section consists of medium to dark grey claystones with the lower section mainly represented by lighter grey claystones. The top and lower sections comprises mainly of calcareous claystones and limestones with the mid section mainly unreactive claystones and dolomites.

Upper Section

Claystone:	medium to dark grey, grey black, (thin layer of grey red at 6500ft), soft to firm, sub-blocky, platy, sub-fissile, homogeneous, varying plastic and earthy textures were seen, generally non to slightly calcareous, locally moderately to very calcareous, micro-pyritic, micro-micaceous, with carbonaceous material in parts.
Limestone:	Mudstone; off white, light brown, light to medium grey, grey brown, moderately firm to firm, blocky, chalky texture, micro-crystalline, locally very argillaceous, grading Dolomitic Limestone in parts, no visible porosity. No Show. Also recovered as medium brown, very hard, angular and brittle, crypto-crystalline with no porosity

Mid Section

Claystone:	dark grey to grey black, occasional light grey to bluish grey, moderately firm to firm, blocky, earthy texture, slightly plastic, non calcareous, locally slightly calcareous, trace disseminated pyrite.
Dolomite:	Mudstone; light to medium brown, light grey brown, light brown, cream, very hard, moderately firm, blocky, micro to crypto-crystalline, chalky texture in parts, locally argillaceous, no visible porosity. No Show.

Lower section

Claystone:	very light to medium grey, very light grey brown to grey brown, white grey to medium grey, very light green to light green grey, (thin layer of pale red brown to orange brown at 9100ft), very soft to firm, amorphous to sub-blocky, waxy, plastic, non to moderately calcareous, with increasing calcimetry values towards the base, glauconitic, trace micromica.
Limestone:	Mudstone; very light grey, white, light brown, orange brown at the base, firm, blocky, chalky, crumbly, chalky texture, occasional angular, brittle, micro to crypto-crystalline, locally argillaceous, no visible porosity. No Show.

Depth Interval ft MD	BACKGROUND GAS									
	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
L. Cretaceous Undiff.	ROP: min/max/avg – 4/224/76									
5530 - 9740	0.06	0.49	0.24	902	5	0	0	0	0	0

Depth ft MDRT	GAS PEAKS									
	Background %	Max %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm	Type
none										
Legend: FG=Formation gas, CG=Connection gas, TG=Trip gas, STG=Short trip gas, SW=Swab gas, POG=Pumps off gas										

EARLY CRETACEOUS
Undifferentiated

9740 – 11085 ft MD
8858 – 9791 ft TVDSS

The Early Cretaceous was picked midway on an increasing trend in gamma log response. This coincided with an increase in rate of penetration, a decrease in resistivity log response, an introduction of red brown claystone and reduction in calcareous content.

Early Cretaceous formation can be divided into two sections mainly on gamma ray trends. The upper section displays an average 85api GR trend with the lower section averaging 73api. Lithology of both sections comprises of interbedded claystone and thin limestone/dolomite stringers, with more numerous limestone beds intersected in the lower section from 10150ft MD and with a massive limestone developed at the base.

Claystone: light grey, light greenish grey, very light grey, reddish brown, reddish grey, brown, locally dark grey, firm to moderately hard, with soft, plastic and sticky, sub-blocky to blocky, earthy texture, platy, amorphous in places, slightly silty, slightly to moderately calcareous, traces of glauconite and disseminated pyrite.

Limestone: mudstone, white, off white, orange brown to brown, with light grey to light green grey, chalky texture, firm to moderately hard, blocky, slightly brittle, crypto to micro-crystalline, black argillaceous laminations, trace of glauconite, no visible porosity. No Show.

Depth Interval ft MD	BACKGROUND GAS									
	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
L. Cretaceous Undiff.	ROP: min/max/avg – 22/131/85									
8579-9029	0.17	0.52	0.31	11495	15	3	0	0	0	0

Depth ft MDRT	GAS PEAKS									
	Background %	Max %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm	Type
none										
Legend: FG=Formation gas, CG=Connection gas, TG=Trip gas, STG=Short trip gas, SW=Swab gas, POG=Pumps off gas										

LATE JURASSIC
Kimmeridge Clay Formation

11,085 – 12252ft MD TD
9791 – 10610.5 ft TVDSS TD

The Upper Jurassic-Kimmeridge Clay Formation was evident from incoming dark claystone with associated typical increase in GR values. The Upper Jurassic formation saw an increase in the background gas from 0.25 % in Lower Cretaceous to 1.4 % through the carbonaceous claystone of the Kimmeridge Clay Formation accompanied by the consistent presence of heavy hydrocarbons C3 to C5 over the drilled section.

1. Interval from 11085 ft to 11544 ft: massive beds of dark, carbonaceous claystone alternating very thin sandstone streaks, mainly in the lower section.
2. Interval from 11544 ft to 11565 ft : a clean blocky sandstone (Sequence 2?)
3. Interval from 11565 ft to 11710 ft : typical “hot” Kimmeridge claystone, dark brown to black grey claystone.
4. Interval from 11710 ft to 12095 ft : this section can be attributed Sequence 1. The section 11710 ft to 11827ft, with the GR gradually decreasing represents a gradually fining up sequence of claystone interspersed with numerous fine sandstone beds. Below 11827ft the Sequence 1 is better developed with a number of discrete blocky sandstones inter bedded with typical looking Kimmeridge claystone.
5. Interval from 12095 ft to 12252 ft (TD) : massive layers of dark, silty claystone and very minor thin calcareous sandstone.

Interval 11,085 ft – 11,544 ft MD (9791 - 10111 ft TVDSS)

Claystone: dark brown grey, firm to hard, blocky, non calcareous, carbonaceous flakes, coaly fragments, pyrite nodules.

Sandstone: medium grey, blocky, hard, well cemented, generally silica cement, micaceous, colourless to translucent grains, very fine grained, partly as "rock flour", light grey to off white to light green, soft, sticky, occasional very fine floating quartz grains, no fluorescence to dull yellow, no cut, although masked by OBM becoming generally medium yellow fluorescence with a moderate bright yellow streaming yellow cut.

Interval 11,544 ft – 11,565 ft MD (10111 – 10126 ft TVDSS)

Sandstone: Sandstone: grey brown, light brown, moderately firm to firm, hard in parts, sub-blocky, moderately sorted, dolomitic cement, silty matrix with clay fragments, poor visible porosity.
Occasional loose quartz, generally fine to medium, also very fine, sub-angular to sub-rounded, moderately spherical, shows: medium yellow with patchy yellow white direct fluorescence, very slow diffuse to streaming cut fluorescence, very weak cut colour, with a clear residual film.

Interval11,565 ft – 11,710 ft MD (10126 –10227 ft TVDSS)

Claystone: dark grey, black grey, very dark brown grey, occasional medium grey, firm to hard, sub-blocky to blocky, sub-fissile, iridescent, non calcareous, carbonaceous, trace bitumen, micromicaceous disseminated pyrite, finely laminated.

Interval 11,710 ft – 12,095ft MD (10227 – 10498 ft TVDSS)

A) 11,710ft – 11,827ft

Claystone: Claystone: dark grey, brownish black, rarely light grey , slightly firm to firm, soft in places, sub-blocky to blocky, sub-platy to platy in places, non calcareous, occasionally slightly silty, carbonaceous, micromicaceous.

Sandstone: white to off white "rock flour", rare very light brown, soft, friable, with quartz grains, colourless, translucent, white, very fine, occasional fine, sub-angular to sub - rounded, sub-spherical, fair sorted, calcareous cement, argillaceous matrix, micaceous, generally as fine laminations in the Claystone. Weak pale yellow

fluorescence, very slow streaming white cut, no residue stain.

B 11,827 ft – 12,095 ft

Claystone: brownish grey, olive brownish grey, occasionally reddish brown, firm to very firm, sub-blocky to blocky, non calcareous, rare slightly silty, slightly micromicaceous.

Sandstone: off white, very light grey, very light brown stained in places, rarely translucent, occasionally medium grey to brownish grey, seen as rock flour in places, common carbonaceous/ argillaceous streaks, very fine, moderately to well sorted, sub-angular to sub-rounded, predominantly firm-friable, slightly calcareous cement, occasionally argillaceous matrix, poor to moderately visual porosity, shows obscured by OBM patchy yellowish-dull yellowish brown direct fluorescence, moderate patchy streaming, yellowish bluish , bluish white cut colour. Also: trace loose quartz grains, clear, transparent, very fine, moderately to well sorted.

Interval 12095 ft - 12252 ft MD TD (10498 – 10610.5 ft TVDSS)

Claystone: grades to Siltstone, brownish grey, olive brownish grey, black grey, occasional medium grey, firm to hard, earthy, sub-blocky to blocky, non to slightly calcareous, non swelling, siltstone in part, slightly micromicaceous, traces micro-pyrite. Rare speck Limestone, off white, firm to moderately hard, blocky, crumbly in part.

Sandstone: Minor trace; light grey, "rock flour", very fine grained, calcareous cemented.

Depth Interval ft MD	**BACKGROUND GAS**									
	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
U. Jurassic Kimmeridge Clay	ROP: min/max/avg – 2/124/49									
11085-12252- TD	0.26	2.97	1.16	7137	380	359	31	129	30	42
1 interval	ROP: min/max/avg – 12/106/65									
11085-11544	0.22	2.47	1.27	12140	350	275	95	25	20	15
2 interval	ROP: min/max/avg – 28/115/72									
11544-11565	0.91	2.90	0.93	7200	400	375	125	35	30	25

3 interval	ROP: min/max/avg – 14/104/33									
11565-11710	0.55	2.97	1.63	10290	485	560	75	240	55	120
4 interval	ROP: min/max/avg – 2.4/124/34									
11710-12095	0.26	2.92	0.86	6175	575	335	40	160	30	40
5 interval	ROP: min/max/avg – 18/71/48									
12095-12252	0.56	1.3	1.07	5750	395	415	43	135	30	40

Depth ft MDRT	**GAS PEAKS**									
	Bkgnd %	Max %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm	Type
11430	0.35	2.47	19644	850	725	61	260	52	63	FG
6090	0.54	2.50	19417	972	805	69	249	50	65	TG (circ at 11566ft)
6550	0.71	3.07	24895	1203	975	83	290	57	73	TG (circ at 11566ft)
8100	2.55	12.22	116706	4911	3831	318	1053	192	247	TG (circ at 11566ft)
9643	2.61	10.30	97719	4015	3203	273	940	179	237	TG (circ at 11566ft)
11566	0.81	2.97	22057	1128	1058	109	429	104	149	TG
11710	0.94	1.92	13184	664	572	60	254	79	124	FG
11839	0.3	0.62	2868	182	178	13	49	10	8	FG
11911	0.46	2.92	21313	1354	1128	69	251	41	53	FG
12000	0.57	2.00	12383	950	930	60	224	39	50	FG
12021	0.71	2.72	17337	1152	1062	64	235	38	48	FG
12079	0.64	1.52	8479	705	789	55	206	37	48	FG
12252	0.4	2.71	17651	1502	1484	102	355	62	78	TG

Legend:
FG=Formation gas, CG=Connection gas, TG=Trip gas, STG=Short trip gas, SW=Swab gas, POG=Pumps off gas

6. CUTTING DESCRIPTIONS LOG

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
		20" shoe set at 2572ft MD. First sample at 2650ft MD.
2650	100	Sand: loose, pebbles, opaque, grey, orange, with common coarse shell fragments.
2700	100	Claystone: brown grey to medium dark grey, soft, sub-blocky, generally non locally calcareous, hydroturgid, abundant fine to medium sand grains grading Sandy Claystone, trace shell fragments, micro-micaceous.
2750	20 80	Claystone: a/a Sand: loose quartz / feldspar, generally colourless, transparent, opaque, orange, yellow, grey, fine to medium grained, sub-rounded, sub-spherical, well sorted, occasional amorphous clay interpreted as matrix, good to moderate inferred porosity, common glauconite, trace mica, rare coarse shell fragments. No Show.
2800	100	Claystone: a/a
2850	80 20	Claystone: common glauconite grading Sandy Claystone. Sand: a/a
2900	100	Sandy Claystone: brown grey to medium dark grey, soft, sub-blocky, generally non calcareous, locally calcareous, common with locally abundant fine to medium sand grains grading Argillaceous Sandstone, common glauconite, trace mica, rare coarse shell fragments.
2950	100	Sandy Claystone: a/a
3000	100	Sandy Claystone: a/a
3050	100	Claystone: medium dark grey, soft to firm in places, sub-blocky, silty earthy texture, generally non calcareous, locally calcareous, trace glauconitic, trace fine sand grains, trace mica, trace red orange flecks.
3100	100	Claystone: a/a becoming grey brown
3150	100 Trace	Claystone: a/a rare nodular pyrite Limestone: Mudstone; off white, mottled grey, moderately firm, blocky, chalky texture, slightly argillaceous, micro-crystalline, no visible porosity. No Show.
3200	100 Trace	Claystone: medium dark to dark grey, firm, blocky, silty earthy texture, locally calcareous, trace fine sand grains, trace mica, trace carbonaceous material. Limestone: a/a off white to very light grey, increasingly argillaceous
3250	100 Trace	Claystone: a/a Limestone: a/a
3300	100	Claystone: a/a increasingly sandy
3350	100	Claystone: a/a
3400	100	Claystone: a/a
3450	100	Claystone: a/a
3500	100	Claystone: a/a common fine to medium sand, increasingly glauconitic.
3550	100 Trace	Claystone: a/a Limestone: Mudstone; light brown, light grey, soft to moderately firm, sub-blocky, chalky texture, slightly argillaceous, micro-crystalline, no visible porosity. No Show.
3600	100	Claystone: trace blue green
3650	100	Claystone: medium dark to dark grey, firm, sub-blocky to blocky, silty earthy texture, non calcareous, trace glauconitic, trace mica, trace carbonaceous flecks, rare nodular pyrite, rare fine sand grains.
3700	100	Missed
3750	100	Claystone: a/a less sand content
3800	100	Claystone: a/a
3850	100	Claystone: medium dark to dark grey, medium grey to medium blue grey, firm, sub-blocky to blocky, silty earthy texture, non calcareous, trace glauconite, micro-micaceous, trace carbonaceous flecks.

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
3900	100 Trace	Claystone: a/a Tuff: light blue to green grey, speckled dark blue green, black and red brown flecks, soft, friable, amorphous, gritty texture, non calcareous, trace glauconite, trace very fine crystalline grains.
3950	100	Claystone: medium grey, grey brown, soft to moderately firm, sub-blocky to blocky, silty earthy texture with very fine sand grains included, non calcareous locally moderately calcareous, trace glauconite, micro-micaceous, trace red brown flecks, trace very fine sand.
4000	100	Claystone: a/a
4050	100	Claystone: grey brown, soft to moderately firm, sub-blocky, silty earthy texture with very fine sand grains included, non calcareous, micro-micaceous, trace carbonaceous flecks.
4100	100	Claystone: a/a
4150	100	Claystone: dark grey brown to brown black, trace medium grey to medium blue grey, firm, blocky, silty earthy texture with very fine sand grains included, non calcareous, micro-micaceous.
4200	100	Claystone: a/a
4250	100	Claystone: a/a loose fine sand
4300	100	Claystone: a/a generally dark grey brown, also medium grey, increasing sand content.
4350	100	Claystone: a/a trace carbonaceous material
4400	100 Trace	Claystone: a/a Sandstone: clear, light grey, cream in parts, firm, friable, rarely cemented generally loose quartz / feldspar, generally colourless, transparent, opaque, orange, yellow, grey, very fine to fine grained, sub-rounded, sub-spherical, well sorted, poor inferred porosity, trace glauconite. No Show.
4450	100 Trace	Claystone: brown grey, medium dark grey, occasionally medium grey, firm, blocky, silty earthy texture, non calcareous, very sandy. Limestone: mudstone; off white to light grey, soft to moderately firm, sub-blocky to amorphous, chalky texture, slightly argillaceous, micro-crystalline, no visible porosity. No Show.
4500	100	Claystone: a/a
4550	100	Claystone: a/a
4600	100	Claystone: a/a increasingly sandy
4650	100 Good Trace	Claystone: a/a Limestone: mudstone; cream, light brown grey, light grey, soft to moderately firm, sub-blocky to amorphous, brittle in parts, micro-crystalline, slightly argillaceous, trace very fine sand inclusions, no visible porosity. No Show.
4700	100	Claystone: dark grey brown to brown black, medium dark grey, trace blue green grey, firm, blocky, silty earthy texture, generally non calcareous, moderately calcareous in parts, micro-micaceous, trace glauconite.
4750	100	Claystone: a/a
4800	100	Claystone: a/a
4850	100 Trace	Claystone: a/a Limestone: mudstone; cream, light brown grey, soft to moderately firm, sub-blocky to amorphous, brittle in parts, micro-crystalline, slightly argillaceous, no visible porosity. No Show.
4900	100	Claystone: a/a
4950	100	Claystone: a/a
5000	100	Claystone: dark grey brown to brown black, firm, blocky, silty earthy texture, non calcareous, micro-micaceous.
5050	100	Claystone: a/a
5100	100	Claystone: dark grey brown to brown black, firm, blocky, silty earthy texture, non calcareous, micro-micaceous.
5150	100	Claystone: a/a
5200	100	Claystone: a/a
5250	90	Claystone: a/a

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
	10	Sandstone: clear, mottled black, orange, light grey, very fine to fine grained, firm, crumbly, weakly cemented with calcite cement, locally argillaceous, rare loose quartz, generally colourless, transparent, opaque, orange, yellow, grey, very fine to fine grained, sub-rounded, sub-spherical, well sorted, poor inferred porosity, trace glauconite. No Show.
5300	100	Claystone: a/a
5350	100	Claystone: a/a trace loose very fine sand
5400	100	Claystone: a/a increase carbonaceous material
5450	100	Claystone: a/a
5500	100	Claystone: dark grey brown to brown black, firm, blocky, silty earthy texture, moderately calcareous, micro-micaceous. Also recovered as light green grey, moderately firm, sub-blocky, homogeneous, very calcareous.
5550	40 60	Claystone: becoming medium to medium dark grey Limestone: Mudstone; off white, light brown, light to medium grey, moderately firm to firm, blocky, chalky texture, micro-crystalline, locally very argillaceous, (also very hard, angular & crypto-crystalline), no visible porosity. No Show.
5600	20 80	Claystone: light to medium grey, firm, blocky, platy, homogeneous, moderate to very calcareous, micro-pyritic. Limestone: a/a
5650	100	Claystone: a/a
5700	100 Trace	Claystone: dark grey brown to brown black, firm, blocky, slightly silty earthy texture, slightly to moderately calcareous, micro-micaceous, common carbonaceous material. Limestone: Mudstone; light brown, light grey, grey brown, moderately firm, blocky, chalky texture, micro-crystalline, slightly argillaceous, no visible porosity. No Show.
5750	100	Claystone: a/a medium dark grey
5800	100	Claystone: medium grey, soft to firm, sub-blocky, platy, homogeneous, very calcareous, micro-pyritic.
5850	90 10	Claystone: a/a Limestone: Mudstone; cream, very hard, angular, brittle, crypto-crystalline; Also recovered as brown grey, speckled / streaked grey, soft, sub-blocky to amorphous, micro-crystalline, locally argillaceous, no visible porosity. No Show.
5900	100	Claystone: dark grey to grey black, moderately firm to firm, blocky, platy, sub-fissile, homogeneous, non calcareous, micro-micaceous, carbonaceous material in parts.
5910	100 Trace	Claystone: a/a Limestone: a/a
5920	100 Trace	Claystone: a/a Limestone: a/a
5930	100 Trace	Claystone: a/a Limestone: a/a
5940	100 Trace	Claystone: dark grey, firm, blocky, silty earthy texture, non calcareous, micro-micaceous. Limestone: a/a
5950	100	Claystone: a/a
5960	90 10	Claystone: a/a Limestone: Mudstone; cream, off white to light grey, firm to moderately hard, hard in parts, blocky, brittle in parts, chalky texture, mainly micro-crystalline occasionally crypto-crystalline, no visible porosity. No Show.
5970	90 10	Claystone: a/a Limestone: a/a
5980	90 10	Claystone: a/a Limestone: a/a
5990	90 10	Claystone: a/a Limestone: a/a
6000	90	Claystone: a/a

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
	10	Limestone: a/a
6010	100	Claystone: medium grey, occasionally light grey, firm to soft, sub-blocky, platy, homogeneous, moderately to very calcareous, micro-pyritic.
6020	100	Claystone: a/a
6030	80 20	Claystone: dark grey, firm, blocky, silty earthy texture, non calcareous, micro-micaceous. Limestone: a/a
6036	80 20	Claystone: a/a locally moderately calcareous. Limestone: a/a
6050	100	Claystone: medium to medium dark grey, moderately firm to firm, platy, sub-fissile, slightly silty, slightly to moderately calcareous, micro-pyritic with rare nodular pyrite.
6090	100 Trace	Claystone: a/a Dolomitic Limestone: Mudstone; light to medium grey brown, light brown, light grey, soft to firm, blocky, chalky texture, micro-crystalline, slightly argillaceous, no visible porosity. No Show.
6110	100 Trace	Claystone: medium dark to dark grey, moderately firm to firm, platy, sub-fissile, slightly silty, slightly to moderately calcareous, micro-pyritic with rare nodular pyrite. Dolomitic Limestone: a/a
6130		Missed
6150		Missed
6170	100 Trace	Claystone: a/a Dolomitic Limestone: a/a
6190		Missed
6210	100 Good Trace	Claystone: a/a Dolomitic Limestone: a/a
6230	100 Trace	Claystone: a/a Dolomitic Limestone: a/a
6250		Missed
6270	100 Trace	Claystone: a/a slightly to moderately calcareous Dolomitic Limestone: a/a
6290		Missed
6310		Missed
6330	100 Trace	Claystone: a/a Dolomitic Limestone: a/a
6350		Missed
6370	100 Trace	Claystone: medium to medium dark grey, moderately firm to firm, blocky, platy, sub-fissile, slightly silty, non to slightly calcareous, trace disseminated pyrite with rare nodular pyrite. Dolomitic Limestone: a/a
6390		Missed
6410	100 Trace	Claystone: a/a Dolomitic Limestone: Mudstone; light to medium grey brown, light brown, soft to moderately firm, blocky, chalky texture, micro-crystalline, no visible porosity. No Show.
6430	100 Trace	Claystone: a/a Dolomitic Limestone: a/a
6450		Missed
6470	100 Trace	Claystone: a/a trace nodular pyrite Dolomitic Limestone: a/a
6490		Missed
6510	100	Claystone: medium to medium dark grey, trace grey red, moderately firm to firm, blocky, platy, sub-fissile, slightly silty, non to slightly calcareous, trace disseminated pyrite.
6530	100 Trace	Claystone: a/a Dolomitic Limestone: a/a

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
6550	100 Trace	Claystone: a/a Dolomitic Limestone: a/a
6570		Missed
6590		Missed
6610	80 20	Claystone: a/a Dolomite: Mudstone; light grey brown to light brown, firm, blocky, chalky texture, micro-crystalline, no visible porosity. No Show. Also recovered as medium brown, very hard, angular, crypto-crystalline, no visible porosity. No show.
6630	100	Claystone: medium dark to dark grey, moderately firm, blocky, homogeneous, slightly sticky, non to slightly calcareous, rare disseminated pyrite.
6650		Missed
6670	100 Trace	Claystone: a/a Dolomite: a/a
6690	100 Good Trace	Claystone: a/a Dolomite: Mudstone; medium brown, cream, very hard, angular, brittle, crypto-crystalline, also recovered as rock flour, no visible porosity. No show.
6710	100	Claystone: a/a
6730	100 Trace	Claystone: a/a Dolomite: a/a
6750	100	Claystone: a/a
6770	100 Trace	Claystone: a/a medium dark to dark grey Dolomite: a/a
6790	100	Claystone: a/a
6810	100 Trace	Claystone: a/a dark grey Dolomite: a/a
6830		Missed
6850	100	Claystone: a/a
6870	100 Trace	Claystone: a/a Dolomite: a/a
6890	100	Claystone: a/a
6910	100 Trace	Claystone: a/a Dolomite: a/a
6930	100 Trace	Claystone: medium dark to dark grey, firm, blocky, slightly silty, non to slightly calcareous, rare disseminated pyrite. Dolomite: Mudstone; light brown to light grey brown, soft to firm, blocky, chalky, micro-crystalline, slightly argillaceous in parts, no visible porosity. No show.
6950	100	Claystone: dark grey, firm, blocky, homogeneous, slightly splintery, non calcareous, rare disseminated pyrite.
6970	100 Trace	Claystone: a/a Dolomite: a/a
6990	100 Good Trace	Claystone: a/a increase in pyrite content Dolomite: a/a
7010	100 Trace	Claystone: a/a common pyrite Dolomite: a/a
7030	100 Trace	Claystone: a/a Dolomite: a/a
7050		Missed
7070	100 Trace	Claystone: a/a Dolomite: a/a
7090	90 10	Claystone: a/a Dolomite: a/a
7110	100	Claystone: a/a dolomitic

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
7130	100	Claystone: a/a
7150		Missed
7170	100 Trace	Claystone: a/a silty Dolomite: a/a
7190	100	Claystone: medium dark to dark grey, moderately firm, blocky, slightly sticky, homogeneous, waxy texture, dolomitic, rare disseminated pyrite.
7210	100 Trace	Claystone: a/a Dolomite: Mudstone; brown grey, grey brown, light brown, cream, very hard, moderately firm, blocky, micro-crystalline, chalky texture, argillaceous in parts, no visible porosity. No show.
7230		Missed
7250	90 10	Claystone: a/a Dolomite: a/a
7270	100	Claystone: a/a mainly dark grey
7290	100	Claystone: a/a
7310	100 Trace	Claystone: a/a Dolomite: a/a
7330	100 Trace	Claystone: dark grey to grey black, moderately firm to firm, blocky, homogeneous, earthy texture, non calcareous locally slightly calcareous, rare disseminated pyrite. Dolomite: a/a
7350		Missed
7370	100 Trace	Claystone: a/a Dolomite: a/a
7390		Missed
7410		Missed
7430	100	Claystone: a/a
7450	100 Trace	Claystone: a/a Dolomite: a/a
7470	100	Claystone: dark grey to grey black, moderately firm to firm, blocky, earthy texture, non calcareous, locally slightly calcareous, trace disseminated pyrite.
7490	100	Claystone: a/a
7510	100	Claystone: a/a
7530	100	Claystone: a/a
7550	100 Trace	Claystone: dark grey to grey black, occasional light grey to bluish grey, moderately firm to firm, blocky, earthy texture, slightly plastic, non calcareous, locally slightly calcareous, trace disseminated pyrite. Dolomite: light brown grey, light brown, very hard to moderately firm, blocky, micro-crystalline, argillaceous in parts, no visible porosity. No show.
7570	100 Trace	Claystone: a/a Dolomite; a/a
7590	100 Trace	Claystone: dark to medium black, occasional light grey to bluish grey, moderately firm to firm, blocky, earthy texture, slightly plastic, non calcareous, locally slightly calcareous, trace disseminated pyrite. Dolomite: light brown grey, light brown, very hard to moderately firm, blocky, micro-crystalline, argillaceous in parts, no visible porosity. No show.
7610	100 Trace	Claystone: a/a Dolomite; a/a
7630	100 Trace	Claystone: a/a Dolomite; a/a
7650	90 10	Claystone: medium to light grey, dark grey, greenish grey in part, firm to moderately hard, blocky, slightly to non calcareous Dolomite; pale yellow brown, light brown, brown grey, firm to hard, blocky, crumbly, argillaceous, nvp, ns.
7670	100	Claystone: a/a

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
	Trace	Dolomite; a/a
7690	100 Trace	Claystone: a/a Dolomite; a/a
7710	100 Trace	Claystone: a/a Dolomite; a/a
7730	100 Trace	Claystone; medium dark grey, grey black, brown grey, firm, sub-blocky to blocky, slightly to non calcareous Dolomite a/a
7750	100 Trace	Claystone: a/a Dolomite: a/a
7770	100 Traces	Claystone: brown grey, medium grey, grey black, occasional light grey, firm to hard, blocky, platy, earthy texture, non swelling, slightly calcareous, trace disseminated pyrite. Dolomite: light brown grey, light brown, grey, very hard to moderately firm, blocky, splintery, micro-crystalline, argillaceous in parts, no visible porosity. No show.
7790	100 Trace	Claystone: a/a Dolomite; a/a
7810	100	Claystone: a/a
7830	100	Claystone: a/a
7850	100 Trace	Claystone; medium grey, grey black, firm, sub-platy to blocky, plastic, waxy texture, generally slightly to non calcareous, moderately calcareous in parts. Dolomite a/a
7870	100	Claystone; light grey, light green grey, trace grey black, soft to firm, sub-blocky to blocky, slightly sticky, waxy texture, moderately to very calcareous.
7890		Missed
7910	100	Claystone: dark grey to grey black, firm, blocky, earthy texture, slightly to non calcareous.
7930	100	Claystone: a/a moderately calcareous in parts
7950	100	Claystone: a/a
7970	100	Claystone: a/a Dolomite: a/a
7990	100	Claystone: a/a
8010	100 Trace	Claystone: dark grey to grey black, dark grey brown, occasional medium grey, firm to moderately hard, blocky, sub-platy, earthy texture rarely plastic, non swelling, slightly calcareous locally calcareous, trace disseminated pyrite. Dolomite: light brown grey, light brown, cream, moderately firm, blocky, chalky texture, micro-crystalline, argillaceous in parts, no visible porosity. No show.
8030	100	Claystone; light to medium grey, light green grey, soft to firm, blocky, slightly sticky, waxy texture, moderately to very calcareous, trace disseminated pyrite.
8050	100	Claystone: a/a
8070	100	Claystone: a/a Dolomite: a/a
8090	100	Claystone: a/a trace carbonaceous material
8110	100	Claystone: a/a
8130	100	Claystone: dark grey to grey black, brown black, firm to moderately hard, blocky, sub-platy, earthy texture, non swelling, non to slightly calcareous, trace disseminated pyrite.
8150	100	Claystone: a/a locally moderately calcareous
8170	100 Trace	Claystone: a/a Limestone: Mudstone; medium to dark brown, moderately firm, blocky, crumbly, micro-crystalline, no visible porosity. No show.
8190	100	Claystone: dark grey to grey black, occasional medium grey, moderately firm, blocky, plastic, waxy texture, occasional earthy texture, non swelling, slightly calcareous, locally moderately calcareous.

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
8210	100	Claystone: a/a Dolomite: a/a
8230	100	Claystone: a/a less calcareous Dolomite: a/a
8250	100 Trace	Claystone: a/a less calcareous Dolomite: a/a
8270	100	Claystone: medium to dark grey to grey black, brown grey, firm to moderately hard, blocky, earthy texture, non swelling, slightly to moderately calcareous, off white calcareous streaks and laminations included.
8290		Missed
8310	100 Trace	Claystone: medium to dark grey to grey black, brown grey, firm to moderately hard, blocky, earthy texture, non swelling, slightly to moderately calcareous, rare off white calcareous specks Dolomite a/a
8330	100 Trace	Claystone: a/a Dolomite: a/a
8350	20 80	Limestone: off white, very light grey, occasional brown, porcellaneous, firm to hard, sub-blocky to blocky, mudstone, cryptocrystalline, chalky. Claystone: medium to dark grey to grey black, brown grey, firm to moderately hard, blocky, earthy texture, non swelling, slightly to moderately calcareous, rare off white calcareous specks
8370	60 40	Limestone; a/a Claystone: a/a
8390	100 Trace	Claystone: medium to dark grey to grey black, brown grey, firm to moderately hard, blocky, earthy texture, non swelling, slightly to moderately calcareous, rare off white calcareous specks Limestone; a/a
8410	100	Claystone: light to medium grey, soft to firm, sub-blocky, crumbly, slightly waxy, plastic, moderately calcareous
8430	100	Claystone: predominantly medium to dark grey, brown grey, a/a
8450		Missed
8470	100 Trace	Claystone: a/a with incoming lighter grey, very calcareous Limestone: off white, light brown a/a
8490	100 Trace	Claystone; medium to dark grey, dark brown grey, firm to moderately hard, in part soft, plastic, blocky to sub-blocky, earthy texture, micromicaceous, moderately calcareous Limestone: off white, light brown, firm, blocky, crumbly, microcrystalline, nvp, ns.
8510	100 Trace	Claystone: a/a with increasing very light grey to greenish grey, very soft, very calcareous, white specks calcite included. Limestone: a/s
8530	100 Trace	Claystone; increasingly lighter grey, very calc in part. Limestone: a/a
8550	100	Claystone: generally a/a, increase in pale green and light grey, very soft, sticky, calcareous.
8570		Missed
8590	100 Trace	Claystone: mainly medium grey, grey brown, a/a slight traces siltstone, light brown grey, friable Limestone: as streaks in the Claystone, off white a/a
8610	100 Trace	Claystone: a/a, slight trace siltstone. Limestone: good trace, white to off white, firm to hard, blocky
8630	100 Trace	Claystone: lighter grey to medium grey, soft to firm, very calcareous, marly else a/a Limestone/Dolomite; light brown, firm, blocky, hard, angular, crumbly
8650	100 Trace	Claystone: a/a Limestone: a/a
8670	100	Claystone: dark grey to dark brown grey, brown black, firm, blocky, locally silty, earthy texture, plastic in parts, non swelling, slightly calcareous, locally moderately calcareous.

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
8690	100 Trace	Claystone: a/a becoming medium grey in colour with increasing calcareous content Limestone: a/a
8710	100	Claystone: as 8670ft
8730		Missed
8750	100	Claystone: medium dark to dark grey, occasional dark brown grey, medium grey, soft to firm, blocky, sub-platy, slightly silty, earthy texture, plastic in parts, non swelling, non to slightly calcareous, locally moderately calcareous.
8770	100	Claystone: a/a predominantly medium to medium dark grey and increasingly calcareous.
8790	100 Trace	Claystone: medium grey, medium to light green grey, occasional medium dark grey, soft to firm, sub-blocky, sub-platy, slightly silty, plastic, earthy texture in parts, non swelling, moderately calcareous, locally non to slightly calcareous. Limestone: Mudstone; white, hard, angular, splintery fracture, crypto-crystalline, no visible porosity. No Show. Dolomite: light brown, moderately firm, blocky, chalky texture, no visible porosity. No Show.
8810	100	Claystone: a/a increasingly dark brown grey, less calcareous.
8830	100	Claystone: medium dark grey, medium grey, trace dark brown grey, moderately firm, blocky, sub-platy, slightly silty, plastic, waxy texture, non swelling, slightly to moderately calcareous.
8850	100	Claystone: a/a
8870	100	Claystone: a/a
8890	100	Claystone: a/a
8910	100	Claystone: medium grey, occasional medium green grey, light grey, soft to firm, sub-blocky, slightly silty, waxy, plastic, slightly calcareous, locally moderately calcareous.
8930	100	Claystone: a/a
8950	100	Claystone: a/a
8970	100	Claystone: medium to medium dark grey, occasional light grey, soft to firm, sub-blocky, elongate, slightly silty, slightly sticky, plastic, waxy texture, calcareous, locally slightly calcareous, trace glauconite.
8990	100	Claystone: a/a
9010	100	Claystone: a/a
9030		
9050	100 Trace	Claystone medium to medium dark grey, rare light grey, firm to moderately hard, sub-blocky to blocky, occasional silty,--light brown grey, waxy, earthy texture, slightly to moderately calcareous Limestone: white to off white firm, blocky, fibrous, included in Claystone
9070	100	Claystone; colour change, very light grey brown, medium brown, occasional white grey, minor very pale green, soft, plastic, sub-blocky, waxy, moderately calcareous
9090	100 Trace	Claystone; a/a with 20% pale red brown, soft to firm, blocky, plastic, waxy, generally non to slightly calcareous Limestone; very light grey, soft, marly
9110	100 Traces	Claystone: very pale grey, pale grey brown, very light green, green grey, white grey, very soft, amorphous, plastic, moderately calcareous, glauconitic. traces orange brown to very pale red brown, mottled pale green, Limestone; off white, firm, crumbly, sub-blocky, argillaceous, cryptocrystalline, no visible porosity, no shows
9130	100 Trace	Claystone: very light grey brown, white grey to medium grey, very light green to light green grey, with pale red brown to orange brown, mottled pale green, very soft to firm, amorphous to sub-blocky, waxy, plastic, non to moderately calcareous, red brown non calcareous, marly in part, glauconitic, trace micromica. Limestone: very light grey, white, firm, blocky, chalky, crumbly, cryptocrystalline, argillaceous, no visible porosity, no shows
9150	100	Claystone: medium to light grey, occasional pale green grey, rare red mottling, firm to soft, blocky to sub-blocky, variably calcareous
9170	100	Claystone; a/a
9190		

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
9210		
9230	100 Trace	Claystone; medium grey, medium to light brown grey, pale green, sub-blocky, plastic, glauconite, calcareous. Limestone; white, occasional brown, blocky, hard, angular.
9250		Claystone; a/a
9270		Claystone; light to medium grey with very pale green, else a/a.
9290	100 Trace	Claystone: very light grey, white grey to medium grey, occasional very light green to light green grey, very soft to firm, amorphous to sub-blocky, waxy, plastic, non to moderately calcareous, marly in part, glauconitic, trace micromica. Limestone: traces, very light grey, white, light brown, firm, blocky, chalky, crumbly, occasional angular, brittle, cryptocrystalline, argillaceous, no visible porosity, no shows
9310	100	Claystone: a/a
9330	100	Claystone: a/a
9350	100 Trace	Claystone: light to medium grey, occasional medium dark grey, with medium green to very light greenish white, firm to soft, blocky, plastic, moderately calcareous Limestone: off white to very light brown, firm, moderately hard, brittle, crypto to microcrystalline, slightly argillaceous, no visible porosity, no shows,
9370		
9390	95 5	Claystone: lighter coloured grey, abundant very pale green grey, greenish white, soft, plastic, in part blocky, moderately hard, slightly to moderately calcareous. Limestone: a/a
9410	90 10	Claystone: a/a Limestone; light brown, firm, blocky, hard, splintery, crypto crystalline
9430	100 Trace	Claystone: a/a Limestone: a/a
9450	100 Trace	Claystone: a/a Limestone: a/a
9470	100 Trace	Claystone: a/a grading to medium dark grey Limestone: a/a
9490	100 Trace	Claystone: a/a Limestone: a/a
9510	100 Trace	Claystone: dark grey, occasional medium grey, firm, blocky, plastic, earthy in parts, slightly silty, slightly to moderately calcareous, trace disseminated pyrite. Limestone: mudstone; light brown, orange brown, light grey, firm to hard, very hard in parts, angular, brittle, crypto to micro-crystalline, chalky texture in parts, slightly argillaceous, no visible porosity. No Shows.
9530	90 10	Claystone: a/a medium grey streaky light grey / white Limestone: a/a
9550	90 10	Claystone: a/a Limestone: a/a
9570	90 10	Claystone: medium grey, light grey finely laminated / streaked white, soft to firm, blocky, plastic, slightly silty, calcareous, Marly in parts. Limestone: mudstone; cream, orange brown, light grey, moderately firm, blocky, splintery, micro-crystalline, chalky texture in parts, no visible porosity. No Shows.
9590		Missed
9610	100 Trace	Claystone: a/a Limestone: a/a
9630		Missed
9650	100 Trace	Claystone: a/a slightly darker, earthy texture Limestone: a/a
9670	70 30	Claystone: medium dark to medium grey, light grey finely laminated / streaked white, dark green grey, soft to firm, sub-blocky to blocky, platy, earthy texture, plastic in parts, slightly silty, calcareous, Marly in part. Limestone: Mudstone; cream, off white, orange brown, light grey, firm, blocky, splintery,

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
		micro-crystalline, chalky texture, also recovered as very hard, angular, brittle, crypto-crystalline, locally argillaceous, no visible porosity. No Shows.
9690		Missed
9710	70 30	Claystone: medium grey, light grey finely laminated / streaked white, light to medium green grey, brown grey, soft to moderately firm, blocky, plastic in parts, calcareous, Marly in part, trace glauconite. Limestone: Mudstone; cream, off white, trace orange brown, very hard, blocky, angular, brittle, micro to crypto-crystalline, no visible porosity. No Shows.
9730	80 20	Claystone: a/a light grey to light green grey Limestone: a/a
9750	100	Claystone: a/a introduction of red brown, grey red, non calcareous.
9770	100	Claystone: light to medium grey, light green grey, red brown, soft to firm, sub-blocky, platy, slightly silty, plastic in parts, non to slightly calcareous, trace glauconite.
9790	100	Claystone: a/a becoming medium dark grey.
9810	100	Claystone: a/a predominantly medium dark grey, occasional medium grey, red brown
9830		
9850	100 Trace	Claystone: light to medium grey, light green grey, blue grey, red brown, grey red, moderately firm to firm, blocky, platy, elongate, slightly silty, non to slightly calcareous. Dolomitic Limestone: cream to light brown, firm, blocky, chalky, microcrystalline, no visible porosity, no shows.
9870		
9890	100	Claystone a/a
9910	100	Claystone; becoming med to dark grey
9930		
9950		
9970		
9990	100 Trace	Claystone; medium to light grey, light green grey, orange to red brown, firm to moderately hard, blocky to sub-blocky, platy, slightly silty, plastic in parts, non to slightly calcareous, trace glauconite. Dolomitic Limestone; traces, very light brown to brown, firm to moderately hard, blocky, micro-crystalline, no visible porosity, no shows.
10010	100 Trace	Claystone: medium to light grey, light green grey, increase in orange to red brown, firm to moderately hard, blocky to sub-blocky, platy, slightly silty, plastic in parts, non to slightly calcareous, trace glauconite. Dolomitic Limestone; traces, a/a
10030		
10050	100 Trace	Claystone; very light grey, light greenish grey, soft, plastic, occasional firm, sub-blocky, slightly calcareous, traces orange brown to red brown claystone, pyritic Dolomitic limestone; very light grey brown, firm, blocky, crumbly, microcrystalline, no visible porosity, no shows.
10070		
10090	100 Trace	Claystone; very light grey, light greenish grey, soft, plastic, occasional firm, sub-blocky, slightly calcareous, traces orange brown to red brown claystone, pyritic Dolomitic limestone; very light grey brown, firm, blocky, crumbly, microcrystalline, no visible porosity, no shows.
10110		
10130		
10150	100	Claystone; light grey with influx of red brown, greenish grey, soft to firm, disseminated pyrite, rare glauconite, else a/a Limestone; a/a off white, moderately hard, microcrystalline to cryptocrystalline, argillaceous, no visible porosity, no shows.
10170	90 10	Claystone; predominantly red brown, light to medium grey, greenish grey, soft to firm, plastic, disseminated pyrite, rare glauconite, else a/a Limestone; a/a off white, moderately hard, brittle, microcrystalline to cryptocrystalline, black

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
		argillaceous laminations, no visible porosity, no shows.
10190	90	Claystone; predominantly red brown, light to medium grey, greenish grey, soft to firm, plastic, disseminated pyrite, rare glauconite, else a/a
	10	Limestone; a/a off white, moderately hard, brittle, microcrystalline to cryptocrystalline, black argillaceous laminations, no visible porosity, no shows.
10210		
10230	90	Claystone; no red brown, light to medium grey, greenish grey, medium dark grey, soft to firm, plastic, disseminated pyrite, moderate to slightly calcareous, rare glauconite, else a/a
	10	Limestone; a/a off white, moderately hard, brittle, microcrystalline to cryptocrystalline, black argillaceous laminations, no visible porosity, no shows.
10250		
10270	100	Claystone; light to medium grey, greenish grey, medium dark grey, soft to firm, plastic, disseminated pyrite, moderate to slightly calcareous, rare glauconite, else a/a
	Trace	Limestone; a/a off white, moderately hard, brittle, microcrystalline to cryptocrystalline, black argillaceous laminations, no visible porosity, no shows.
10290	90	Claystone; a/a
	10	Limestone; a/a
10310	95	Claystone: light to medium grey, very light green grey, occasional very dark grey, soft to moderately hard, amorphous to blocky, plastic in part, occasional disseminated pyrite, carbonaceous?, moderately calcareous.
	5	Limestone: Mudstone; off white, blocky, crumbly, splintery, micro crystalline, no visible porosity, no shows.
10330	95	Claystone: light to medium grey, very light green grey, occasional very dark grey, trace red brown, soft to moderately hard, amorphous to blocky, plastic in part, occasional disseminated pyrite, moderately calcareous.
	5	Limestone: Mudstone; off white, blocky, occasional very hard, angular, crumbly, splintery, micro crystalline, no visible porosity, no shows.
10350	100	Claystone: a/a
	Trace	Limestone: white to off white a/a
10370		Missed
10390	95	Claystone: light to medium grey with light green grey, pale green, occasional very dark grey, trace red brown, soft to moderately hard, amorphous to blocky, plastic in part, occasional disseminated pyrite, glauconitic, moderately calcareous.
	5	Limestone; off white to white, blocky, occasional very hard, angular, crumbly, splintery, micro crystalline, no visible porosity, no shows.
10410	100	Claystone: very light grey to white grey with light green grey, pale green, soft to moderately firm, amorphous to sub-blocky, plastic in part, moderate to very calcareous, marly.
	Trace	Limestone: Mudstone; off white to white, brown, blocky, occasional very hard, angular, crumbly, splintery, micro crystalline, no visible porosity, no shows.
10430	100	Claystone; very light grey-white grey, greenish grey to pale green, else a/a
10450	100	Claystone; becoming medium dark grey
	Trace	Limestone; a/a
10470	100	Claystone: medium dark to dark grey, light to medium grey, green grey, soft to moderately firm, firm in parts, amorphous to sub-blocky, plastic in part, slightly sticky, moderate to very calcareous, trace disseminated pyrite.
10490		Missed
10510	100	Claystone; becoming lighter
	Trace	Limestone; a/a
10530	100	Claystone: light to medium grey, light to medium green grey, occasional medium dark grey, soft to moderately firm, sub-blocky, plastic, slightly sticky, moderate to very calcareous, trace disseminated pyrite.
10550	100	Claystone; a/a introduction of red brown, grey red cuttings
10570	100	Claystone: varicoloured, very light to light grey, medium grey, light green grey, red brown, light brown, soft to moderately firm, sub-blocky, plastic, slightly sticky, moderate to very

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
		calcareous.
10590		Missed
10610	100	Claystone; a/a increasing red brown, dark grey red & introduction of dark grey cuttings
10630	100 Trace	Claystone: red brown, occasional dark grey red, dark grey, firm, blocky, plastic in part, waxy texture, slightly sticky, moderately calcareous, non to slightly calcareous in part. Limestone: Mudstone; off white, light brown, firm, blocky, slightly splintery, chalky texture, micro-crystalline, no visible porosity. No shows.
10650		Missed
10670	100	Claystone: dark grey, occasional red brown, firm, blocky, plastic in part, waxy texture, slightly sticky, non to slightly calcareous, moderately calcareous in part.
10690	100	Claystone; no red brown.
10710		Missed
10730	100	Claystone: dark grey, medium to medium dark grey, firm, blocky, platy, plastic in part, waxy texture, non to slightly calcareous, locally moderately calcareous.
10750	100	Claystone; a/a
10770	100 Trace	Claystone; a/a Limestone; a/a
10790		Missed
10810	100	Claystone; a/a dark grey to grey black
10830	100	Claystone; a/a re-introduction of red brown, dark grey red, dark brown cuttings
10850	100 Trace	Claystone: dark grey, red brown, occasional dark grey red, dark brown, medium grey, firm, blocky, platy, plastic in part, waxy texture, slightly sticky, homogeneous, non to slightly calcareous, moderately calcareous, in part. Limestone: Mudstone; light brown, light red, occasional off white, firm, sub-blocky, crumbly, chalky texture, micro-crystalline, slightly argillaceous, no visible porosity. No shows.
10870		Missed
10890	100	Claystone; a/a increasing red brown
10910	100	Claystone; a/a mainly red brown
10930	100	Claystone; a/a
10950		Missed
10970	100	Claystone; a/a intro dark grey to grey black
10990	100	Claystone: dark red brown, dark grey red, dark brown, trace dark grey, firm, blocky, earthy texture, plastic in part, non to slightly calcareous, trace disseminated pyrite.
11010	100	Claystone; a/a
11030	100	Claystone; a/a
11050	100 Trace	Claystone; a/a Limestone: Mudstone; light brown, patchy dark grey, cream, firm to moderately hard, blocky, splintery, angular, micro-crystalline, slightly argillaceous, no visible porosity. No shows.
11070	100 Trace	Claystone; a/a Limestone; a/a
11090	40 60	Claystone: dark grey, dark brown grey, firm, blocky, silty, earthy texture, non calcareous, locally very pyritic. Limestone: mudstone; off white to light grey, light green grey, firm, blocky, splintery, slightly brittle, micro-crystalline, argillaceous in parts, glauconitic, no visible porosity. No shows.
11110	60 40	Claystone: a/a Limestone: a/a
11130	90 10 Trace	Claystone: medium to dark grey, dark brown grey, firm, blocky to sub-fissile, earthy texture, non calcareous, micromicaceous, pyrite. Limestone: Mudstone; off white to light grey, light green grey, firm, blocky, splintery, slightly brittle, micro-crystalline, argillaceous in parts, glauconitic, dolomitic, no visible porosity. No shows. Sandstone: medium grey, blocky, hard, well cemented, generally silica cement, micaceous, colourless to translucent grains, very fine grained, partly as "rock flour", light grey to off white to light green, soft, sticky, occasional very fine floating quartz grains, no fluorescence to dull

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
		yellow, no cut
11150	70	Claystone: medium to dark grey, dark brown grey, firm, blocky to sub-fissile, earthy texture, non calcareous, micromicaceous, pyrite.
	30	Limestone: Mudstone; off white to light grey, light green grey, firm, blocky, splintery, slightly brittle, micro-crystalline, argillaceous in parts, glauconitic, dolomitic, no visible porosity. No shows.
	trace	Sandstone: as "rock flour", light grey to off white to light green, soft, sticky, occasional very fine floating quartz grains, slightly calcareous/dolomitic, no fluorescence to dull yellow, no cut
11170	100	Claystone: medium to dark grey, dark brown grey, firm, blocky to sub-fissile, earthy texture, non calcareous, micromicaceous, pyrite.
	Trace	Limestone: a/a
	Trace	Sandstone: as "rock flour", light grey to off white to light green, soft, sticky, occasional very fine floating quartz grains, no fluorescence to dull yellow, no cut
11190	100	Claystone: medium to dark grey, dark brown grey, firm, blocky to sub-fissile, earthy texture, non calcareous, micromicaceous, pyrite.
	Trace	Sandstone: white to light grey, partly "rock flour", very fine grained, firm to friable, sub-angular.
11210	100	Claystone: medium to dark grey, dark brown grey, firm, blocky to sub-fissile, earthy texture, non calcareous, micromicaceous, pyrite.
	Trace	Sandstone: white to light grey, partly "rock flour", very fine grained, firm to friable, sub-angular.
	Trace	Limestone a/a
11230	100	Claystone: medium to dark grey, dark brown grey, firm, blocky to sub-fissile, earthy texture, non calcareous, micromicaceous, pyrite.
	Trace	Sandstone a/a
11250	100	Claystone: dark brown grey, firm to hard, blocky, non calcareous, carbonaceous flakes, coaly fragments, pyrite.
	Trace	Sandstone a/a
11270	100	Claystone: dark brown grey, firm to hard, blocky, non calcareous, carbonaceous flakes, coaly fragments, pyrite.
	Trace	Sandstone a/a
11290	100	Claystone: dark brown grey, firm to hard, blocky, non calcareous, carbonaceous flakes, coaly fragments, pyrite.
11310	100	Claystone: a/a Very Slight trace Sandstone
11330	100	Claystone: dark brown grey, firm to hard, blocky, non calcareous, carbonaceous flakes, coaly fragments, pyrite nodules Slight trace Sandstone
11350	100	Claystone: a/a Very slight trace Sandstone
11370	100	Claystone: a/a
	Trace	Sandstone; a/a in part hard, blocky, well cemented, faint medium yellow fluorescence, moderately bright yellow crush cut
11390	100	Claystone: dark brown grey, firm to hard, blocky, non calcareous, carbonaceous flakes, coaly fragments, pyrite.
	Trace	Sandstone; content increasing 1-2%, shows masked by OBM
11410	100	Claystone: dark grey to dark brown grey, firm to moderately hard, locally very hard, sub-blocky to blocky, non calcareous, carbonaceous specks, pyrite.
	Trace	Sandstone: occasional rock flour, off white to very light grey, soft, friable, very fine grained, colourless to translucent, sub-angular, moderately sorted, weak calcareous cement, micaceous, poor visible porosity.
11430	100	Claystone: a/a
	Trace	Sandstone: a/a
11430	100	Claystone: a/a disseminated and nodular pyrite

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
	Trace	Sandstone: a/a
11450	100	Claystone: a/a
	Trace	Sandstone: a/a calcite cement
11470	100	Claystone: a/a
	Trace	Sandstone: a/a
11480	80	Claystone: a/a
	20	Sandstone: a/a
11490	100	Claystone: dark grey to dark brown grey, firm to moderately hard, blocky, earthy, non calcareous, carbonaceous specks, pyrite.
	Trace	Sandstone: with occasional thin streaks, very light grey to white grey, firm, crumbly, very fine grained, with weak calcareous cement, poor visible porosity.
11510	100	Claystone: introduction of olive black
	Trace	Sandstone: streaks in the claystone.
11530	95	Claystone: dark grey to olive black, firm to moderately hard, blocky, earthy, non calcareous, carbonaceous specks, micro-micaceous, disseminated and nodular pyrite.
	5	Sandstone: very light grey, white, blue white, soft to firm, crumbly, loose quartz grains, very fine to fine, sub-angular to rounded, moderately sorted, moderately spherical, white matrix fill, moderate calcareous cement, poor visible porosity, Shows; even dull yellow fluorescence, slow hazy yellow white cut fluorescence with no residue.
11550	95	Claystone: pyrite nodules, micro-micaceous
	5	Sandstone: a/a with quartz aggregates light brown, very fine to medium, angular to sub-rounded, moderately spherical, fairly sorted, generally cemented with siliceous cement, poor visible porosity. Shows; even dull yellow direct fluorescence, slow hazy yellow white cut fluorescence with no residue.
11554	75	Claystone: micro-micaceous
Core Point	25	Sandstone: grey brown, light brown, moderately firm to firm, hard in parts, sub-blocky, moderately sorted, dolomitic cement, silty matrix with clay fragments, poor visible porosity. Occasional loose quartz, generally fine to medium, also very fine, sub-angular to sub-rounded, moderately spherical, shows: medium yellow with patchy yellow white direct fluorescence, very slow diffuse to streaming cut fluorescence, very weak cut colour, with a clear residual film. Delayed BU with 80% Sand in cuttings.
11570		
11590		
11610		Cored from 11554ft to 11644ft, cut 90ft, recovered 91.5ft. Core retained in sleeve.
11630		
11650	100	Claystone: dark grey, black grey, very dark brown grey, firm to hard, sub-blocky to blocky, sub-fissile, non calcareous, carbonaceous, micromicaceous.
11670	98	Claystone: dark grey, black grey, very dark brown grey, occasional medium grey, firm to hard, sub-blocky to blocky, sub-fissile, iridescent, non calcareous, carbonaceous, trace bitumen, micromicaceous disseminated pyrite, finely laminated.
	2	Sandstone;: white to off white "rock flour", rare very light brown, soft, friable, with quartz grains, colourless, translucent, white, very fine, occasional fine, sub-angular to sub - rounded, sub-spherical, fair sorted, calcareous cement, argillaceous matrix, micaceous, generally as fine laminations in the Claystone. Weak pale yellow fluorescence, very slow streaming white cut, no residue stain.
11690	100	Claystone; a/a
	Trace	Sandstone; a/a
11710	100	Claystone; a/a
	Trace	Sandstone; a/a
11720	90	Claystone: dark grey, black grey, very dark brown grey, occasional medium grey, firm to hard, sub-blocky to blocky, sub-fissile, iridescent, non calcareous, carbonaceous, trace bitumen, micromicaceous disseminated pyrite, finely laminated.
	10	Sandstone: white to off white "rock flour", rare very light brown, soft, friable, with quartz

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
		grains, colourless, translucent, white, very fine, occasional fine, sub-angular to sub - rounded, sub-spherical, fair sorted, calcareous cement, argillaceous matrix, micaceous, generally as fine laminations in the Claystone. Weak pale yellow fluorescence, very slow streaming white cut, no residue stain.
11730	100	Claystone: dark grey, brownish black, rarely light grey and reddish brown, slightly firm to firm, soft in places, sub-blocky to blocky, sub-platy to platy in places, non calcareous, occasionally slightly silty, carbonaceous, micromicaceous.
	Trace	Sandstone: loose quartz grains, clear, transparent to translucent, very fine to fine, sub-angular to sub-rounded, poorly sorted. Also: off white-white as rock flour, very light brown, very fine, firm, friable, poorly to moderately cemented, siliceous cement/argillaceous matrix.
11750	100	Claystone; a/a, micromicaceous, streaks and blebs of calcareous sandy streaks within the claystone, generally non calcareous.
	Trace	Sandstone; a/a rare colourless aggregates, very hard, silica cement.
11770	95	Claystone: dark grey, dark brownish grey, firm to very firm, sub-blocky to blocky, sub-platy in places, non calcareous, slightly to moderately silty in places, occasionally sand inclusions and laminations, slightly micromicaceous, rare pyrite.
	5	Sandstone: off white-white, very light grey in places, seen as rock flour in places, locally carbonaceous/argillaceous streaks and laminations, very fine, poorly to moderately sorted, sub-angular to sub-rounded, sub-spherical to spherical, common friable, poorly cemented, slightly to moderately calcareous cement, poor to moderately visual porosity, shows obscured by OBM. Also: loose quartz grains, clear, milky, transparent to translucent, common angular to sub-angular, medium to coarse (seen as quartz chips in places)
11778	70	Claystone: a/a, rare reddish brown
(spot)	30	Sandstone: a/a
11790	80	Claystone: a/a, occasionally light greenish grey
	20	Sandstone: a/a, light grey in places, predominantly firm, friable, occasionally hard, very well cemented, slightly to moderately calcareous cement, tight.
11810	90	Claystone: dark grey, dark brownish grey, brown black, medium dark grey, firm to very firm, occasionally hard, sub-blocky to blocky, sub-platy in places, earthy texture, non calcareous, slightly to moderately silty in places, occasionally sand inclusions and laminations, slightly micromicaceous, rare pyrite.
	10	Sandstone: aggregates, off white-white, very light grey to very pale brown in places, seen as rock flour in places, locally carbonaceous/argillaceous streaks and laminations, very fine, poorly to moderately sorted, sub-angular to sub-rounded, sub-spherical to spherical, common friable, poorly cemented, slightly to moderately calcareous cement, locally well cemented, very hard, poor to moderate visual porosity, shows obscured by OBM, weak to moderate yellow fluorescence, slow streaming yellow white cut. Also: loose quartz grains, clear, milky, transparent to translucent, common angular to sub-angular, medium to coarse (seen as quartz chips in places)
11830	70	Claystone: dark grey, dark brownish grey, brown black, medium dark grey, occasional medium grey, firm to very firm, occasionally hard, sub-blocky to blocky, sub-platy in places, earthy dull texture, non calcareous, slightly to moderately silty in places, grades to Siltstone in part, occasionally sand inclusions and laminations, slightly micromicaceous, rare pyrite.
	30	Sandstone: aggregates, off white-white, very light grey to very pale brown in places, locally carbonaceous/argillaceous streaks and laminations, very fine, poorly to moderately sorted, sub-angular to sub-rounded, sub-spherical to spherical, common friable, poorly cemented, slightly to moderately calcareous cement, locally well silica cemented, very hard, glassy, no to moderate visual porosity, shows obscured by OBM, weak to moderate yellow fluorescence, slow streaming yellow white cut, rare loose quartz grains, clear, milky, transparent to translucent, common angular to sub-angular, medium to coarse (seen as quartz chips in places)
11850	60	Claystone: dark grey, brownish grey, firm to very firm, sub-blocky to blocky, sub-platy to platy in places, non calcareous, slightly silty in places, slightly micromicaceous, carbonaceous in places.
	40	Sandstone: light grey, off white-white, occasionally seen as rock flour, occasionally very light

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
		brown stained, common carbonaceous streaks, claystone laminations in place, very fine, moderately to well sorted, sub-angular to sub-rounded, predominantly firm-friable, slightly calcareous cement, moderate visual porosity in places, shows obscured by OBM, patchy bright yellowish direct fluorescence, slow to moderate patchy streaming, yellowish bluish white cut colour. Also: transparent-translucent, medium to coarse, sub-angular to sub-rounded loose quartz grains.
11860 (spot)	50 50	Claystone: a/a, olive brownish grey in places. Sandstone: a/a, seen as rock flour in places, slight to moderate calcareous cement in places, moderately hard and tight in places, rarely siliceous cement, shows: a/a.
11870	50 50	Claystone: a/a, becoming slight to moderately silty in places. Sandstone: a/a
11890	80 20	Claystone: brownish grey, olive brownish grey, occasionally reddish brown, firm to very firm, sub-blocky to blocky, non calcareous, rare slightly silty, slightly micromicaceous. Sandstone: a/a
11910	75 25	Claystone: a/a Sandstone: off white-white, very light grey, very light brown stained in places, seen as rock flour in places, common carbonaceous/argillaceous streaks, very fine, moderately to well sorted, sub-angular to sub-rounded, firm-friable, slightly calcareous cement, poor to moderately visual porosity, shows obscured by OBM: patchy bright yellowish direct fluorescence, slow to moderate patchy streaming, yellowish bluish white cut colour. Also: trace loose quartz grains, clear, transparent, very fine, moderately to well sorted
11930	25 75	Claystone: a/a, silty in places grading silty claystone, micromicaceous in places. Sandstone: off white, very light grey, very light brown stained in places, rarely translucent, occasionally medium grey to brownish grey, seen as rock flour in places, common carbonaceous/argillaceous streaks, very fine, moderately to well sorted, sub-angular to sub-rounded, predominantly firm-friable, slightly calcareous cement, occasionally argillaceous matrix, poor to moderately visual porosity, shows obscured by OBM patchy yellowish-dull yellowish brown direct fluorescence, moderate patchy streaming, yellowish bluish , bluish white cut colour. Also: trace loose quartz grains, clear, transparent, very fine, moderately to well sorted.
11950	20 80	Claystone: a/a Sandstone: very light grey, very pale orange, off white, common as rock flour, very light brown stained, carbonaceous/argillaceous streaks, very fine, well sorted, firm-friable, slightly to moderately calcareous cement, poor visual porosity, trace mica, shows obscured by OBM: patchy yellowish bright direct fluorescence, slow streaming yellowish cut colour.
11970	80 20	Claystone: dark grey to dark brownish grey, firm to very firm, sub-blocky to blocky, non calcareous, slightly micromicaceous. Sandstone: a/a
11990	60 40	Claystone: a/a, very silty in places grading silty claystone Sandstone: a/a. Also: brown to brownish grey, very fine to silty in places, well sorted, sub-angular to sub-rounded, firm-friable, argillaceous matrix, non calcareous, poor visual porosity.
12010	10 90	Claystone: a/a Sandstone: a/a, shows masked by OBM: dull yellowish brown direct fluorescence, slow yellowish blue cut colour. Also (5%): loose quartz grains, transparent to translucent, very fine, poor to moderately sorted, sub-angular to sub-rounded
12030	20 80	Claystone: dark grey to dark brownish grey, firm to very firm, sub-blocky to blocky, non calcareous, slightly micromicaceous. Sandstone: very light grey, very pale orange, off white, common as rock flour, very light brown stained, carbonaceous/argillaceous streaks, very fine, well sorted, firm-friable, slightly to moderately calcareous cement, poor visual porosity, trace mica, shows obscured by OBM: patchy yellowish bright direct fluorescence, slow streaming yellowish cut colour.
12050	10 90	Claystone: a/a Sandstone: a/a
12070	10 90	Claystone: a/a Sandstone: a/a

DEPTH (m)	%	LITHOLOGICAL DESCRIPTION
12090	90	Sandstone: white to off white, grey, soft to firm, friable, sub-blocky, rock flour, very fine, rare fine, sub-angular to sub-rounded translucent to cloudy white grains, slightly calcareous, shows a/a
	10	Claystone; dark grey, grey brown, black grey, blocky, firm to hard, laminated, micromicaceous slightly carbonaceous, non calcareous
12110	95	Claystone: brownish grey, olive brownish grey, black grey, occasional medium grey, firm to hard, sub-blocky to blocky, non calcareous, silty in part, slightly micromicaceous.
	5	Sandstone: a/a
12130	100	Claystone: brownish grey, olive brownish grey, black grey, occasional medium grey, firm to hard,, sub-blocky to blocky, non calcareous, silty in part, slightly micromicaceous.
12150	100	Claystone: grades to Siltstone, brownish grey, olive brownish grey, black grey, occasional medium grey, firm to hard, earthy, sub-blocky to blocky, non to slightly calcareous, non swelling, siltstone in part, slightly micromicaceous, traces micro pyrite. Rare speck Limestone, off white, firm to moderately hard, blocky, crumbly in part.
	Trace	Minor trace Sandstone; light grey, "rock flour", very fine grained, calcareous cemented.
12170	100	Claystone: grades to Siltstone, brownish grey, olive brownish grey, black grey, occasional medium grey, firm to hard, earthy, sub-blocky to blocky, non to slightly calcareous, non swelling, siltstone in part, slightly micromicaceous, traces micro pyrite. Rare speck Limestone, off white, firm to moderately hard, blocky, crumbly in part.
12190	100	Claystone; a/a
12210	100	Claystone: grades to Siltstone, brownish grey, olive brownish grey, black grey, occasional medium grey, firm to hard, earthy, sub-blocky to blocky, non to slightly calcareous, non swelling, siltstone in part, slightly micromicaceous, traces micro pyrite. Rare speck Limestone, off white, firm to moderately hard, blocky, crumbly in part.
12230	100	Claystone: a/a
12250	100	Claystone: a/a

7. WIRELINE LOGGING OPERATIONS

Run	Logging tools	Interval	Date	Comments
#1a	SLAM-XMAC-FLEX	12252- 6012	06-07/04/11	FLEX recorded 800 ft, 12120-11320 ft, GR to surface, Logging TD=12252 ft MDRT, Casing shoe=6012 ft MDRT, BHT=219.4 deg F, overpull to 3000 lbs observed on recording main up log.
#1b	EI-GR	12120-11320	08-09/04/11	800 ft recorded, overpull to 1000 lbs observed while running in hole
#1c	MREX-GR	12118-11919 / 11871-11320	09-10/04/11	Tool functionality issues and hole problems (tension to 10000 lbs) were experienced over the recorded interval that resulted in 48 ft gap in data acquired.
#1d	RCI-GR	11549.5-12084	10-11/04/11	Pretests: 39 total-12 Good, 25 Tight, 2 Aborted Fluid sampling: 3 bottles (840cc)x2 per depth (12002 ft, 12023 ft and 11565 ft). Overpull to 4500 lbs (above the jar) while pulling out from the last sampling depth at 11565 ft.

Wireline logging operation witnessed by assigned specialist from Gaia Earth Sciences Ltd Company.

APPENDIX A: 210_30a-4_Samples Shipping Manifest_BHI

APPENDIX B: 210_30a-4_Logging Diary_BHI Wireline

APPENDIX C: 210_30a_4_BHI Wireline Tool diagrams

BAKER HUGHES

INTEQ

Shipping Manifest

From:	**Inteq Unit 442** **O/B Transocean Prospect** **C/O Sterling Resources UK Ltd**	**To:**	**ASCO** **Peterhead**
	Cladhan – 210/30a-4		**Boat Name:** **Havila Fortress** **Container No.** **AMB 1490** **Dispatch date:** **9th April 2011**

Bulk Unwashed Wet sets from Sterling well 210/30a-4 - as follows:

Set A:

12 green plastic boxes

Sterling Resources UK Ltd

CORPRO
Muirtonside
Whitecairns
Aberdeenshire
AB23 8UP
FAO: Dick Peterson

Box No.	Set	Sample Type	Depth Interval
1	A	Wet and Unwashed	2639 – 3950
2	A	Wet and Unwashed	3950 – 5250
3	A	Wet and Unwashed	5250 – 6430
4	A	Wet and Unwashed	6430 – 7210
5	A	Wet and Unwashed	7210 – 7910
6	A	Wet and Unwashed	7910 – 8550
7	A	Wet and Unwashed	8550 – 9410
8	A	Wet and Unwashed	9410 – 9990
9	A	Wet and Unwashed	9990 – 10770
10	A	Wet and Unwashed	10770 – 11450
11	A	Wet and Unwashed	11450 – 11870
12	A	Wet and Unwashed	11870 – 12252

Set B:

12 green plastic boxes

Sterling Resources UK Ltd

British Geological Survey
NGDC,
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
FAO: Scott Renshaw

Box No.	Set	Sample Type	Depth Interval
1	B	Wet and Unwashed	2639 – 3950
2	B	Wet and Unwashed	3950 – 5250
3	B	Wet and Unwashed	5250 – 6430
4	B	Wet and Unwashed	6430 – 7210
5	B	Wet and Unwashed	7210 – 7910
6	B	Wet and Unwashed	7910 – 8550
7	B	Wet and Unwashed	8550 – 9410
8	B	Wet and Unwashed	9410 – 9990
9	B	Wet and Unwashed	9990 – 10770
10	B	Wet and Unwashed	10770 – 11450
11	B	Wet and Unwashed	11450 – 11870
12	B	Wet and Unwashed	11870 – 12252

Washed and dried samples from Sterling well 210/30a-4 - as follows:

Set C:

1 plastic wrapped package
(containing 6 cardboard boxes)

Sterling Resources UK Ltd

CORPRO
Muirtonside
Whitecairns
Aberdeenshire
AB23 8UP
FAO: Dick Peterson

Box No.	Set	Sample Type	Depth Interval
1	C	Washed and Dried	2639 – 6036
2	C	Washed and Dried	6036 – 7750
3	C	Washed and Dried	7750 – 9350
4	C	Washed and Dried	9350 – 10850
5	C	Washed and Dried	10850 – 11870
6	C	Washed and Dried	11870 - 12252

Set D:

1 plastic wrapped package
(containing 6 cardboard boxes)

Sterling Resources UK Ltd

British Geological Survey
NGDC,
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
FAO: Scott Renshaw

Box No.	Set	Sample Type	Depth Interval
1	D	Washed and Dried	2639 – 6036
2	D	Washed and Dried	6036 – 7750
3	D	Washed and Dried	7750 – 9350
4	D	Washed and Dried	9350 – 10850
5	D	Washed and Dried	10850 – 11870
6	D	Washed and Dried	11870 - 12252

Mud samples from Sterling well 210/30a-4 as follows:

Set E:

1 green plastic box

Sterling Resources UK Ltd

CORPRO
Muirtonside
Whitecairns
Aberdeenshire
AB23 8UP
FAO: Dick Peterson

Box	Set	Sample Type	Depth
1	E	Mud Sample	3650 – 12252

Total Number of items: 27

25 green plastic boxes
2 plastic wrapped packages

This information given above is true and correct to the best of our knowledge.

Baker Hughes Inteq
Lucian Nitu

Client Representative
Sandy Jamieson

WELLSITE LOGGING REPORT

Sterling Resources (UK) Ltd

Cladhan 210/30a-4

HOLE DATA		MUD DATA		WIRELINE	
Run #:	1	Type:	OBM	Logging Co.:	Baker Atlas
TD Driller:	12252 ft	Density:	12.65	Engineer:	Ben Hayland/Russ Macauley
TD Logger:	12252 ft	Viscosity:	60	Witness:	G. Vernica/P.Clint
Casing Driller:	13 3/8" @ 6015 ft	PV.YP:	27/29	Start Date:	06 April 2011
Casing Logger:	13 3/8" @ 6012 ft	F/30min :	3.8	Start Time:	23:00
Bit Size:	12.25"	Cake	2	End Date:	11 April 2011
Logging Date:	06 April 2011			End Time:	22:30

LOGGING SEQUENCE

Trip Number	Top	Bottom	Hours	Tools	Remarks
1A	574	12237	23hr 30min	SLAM-XMAC-FLEX	Max Recorded Temp 219.4 °F
1B	11320	12120	19hr 55min	EI-GR	Max Recorded Temp 220 °F
1C	11320	12120	13hr 30min	MREX-GR	Max Recorded Temp 214.8 °F
1D	11549.5	12084	31hr 00min	RCI-GR	Max Recorded Temp 223.3 °F

LOGGING OPERATIONS SUMMARY

Date	From	To	Description of Operation
			run #1a SLAM - XMAC - FLEX
6-Apr-11	23:00	23:15	Tool box talk
7-Apr-11	23:15	00:25	RU sheaves and compensator
	00:25	02:00	MU tools run #1a, calibration checks
	02:00	03:20	Completed surface checks, load sources, RIH to 301.7 ft.
	03:20	03:30	Menriding needed to tie up the hoses back to top drive.
	03:30	03:55	Compensator set (change depth by -24.6 ft). Drill crew still workig on changing kelly bowle.
	03:55	04:00	Start RIH
	04:00	05:15	Tool at the casing shoe, add 4.7 ft to the depth (as per depth control procedure). Perform log calibrations on density caliper and HDIL
	05:15	06:22	Continue RIH in open hole. Tool hung up at 9980 ft (passed after trying to different speeds), 10200 ft, 11040 ft.
	06:22	06:27	Unit shut down due to pressurising control panel failure. Fixed.
	06:27	06:54	Continue RIH tool near TD, added 20.1 ft (as per depth control procedure)
	06:54	08:10	Repeat pass from 12100-11900 ft at 5.4 ft/min
	08:10	08:20	RIH and tag bottom, pull and observe tension, logging depth 12252 ft, BHT 219.4 degF.
	08:20	11:10	Started main up log at 11320 ft SLAM-XMAC-FLEX at 5.4 ft/min (restricted speed for FLEX operation). SLAM in high resolution mode. Shear sonic needs proccesing on base.
	11:10	11:15	Stop recording FLEX at 11320 ft. Mis spool on the drum. Close caliper and arrange spool. Residual activation on FLEX created GR spike at 11229 ft.
	11:15	15:30	Continue main up log to casing shoe. Tool observed hanging up at 11160 ft, 10697 ft and 9718 ft with overpull ~+2000 lbs. Higher overpull observed ~+3000 lbs at 10697 ft. Caliper closed to avoid firing up the jar (set to 3300 lbs overpull)-tool freed-caliper open, continue logging, no data loss.
	15:30	15:45	Tool inside casing. Stop all the tools apart from GR, RIH to 6200 ft for GR overlap.
	15:45	18:40	Casing up log GR only, pull out to 300 ft, remove compensators.
	18:40	19:30	Tool box talk and safety-think plan prior bringing source at surface. Pull tool to surface
	19:30	20:45	Tool at surface, after log verifications on GR/SL11/CN/ZDL
	20:45	22:00	Rig down run #1 tools
	22:00	22:30	Rig down wireline for the BOP tests.
			run #1b EI - GR
8-Apr-11	20:15	20:30	EI-MREX tools off the boat
9-Apr-11	20:30	00:45	Check tools on deck while rig completes BOP tests and surface tests.
	00:45	01:40	Move tools to cat walk
	01:40	01:54	Think plan
	01:54	02:18	Well to BHI commence rig up sheaves etc
	02:18	03:20	Start to make up tools
	03:20	03:40	Tools made up , test
	03:40	03:57	Rig crew tie back top drive hoses
	03:57	04:19	RIH and set compensator
	04:19	04:30	Compensator set. Timeouts suddenly on EI tool, start trouble-shooting
	04:30	04:40	Compensator off, POOH from 300ft
	04:40	05:45	Remove all units above telemetry except the transformer. Check cable head back to unit OK. Power up to MREX and EI. Tools seem fine. Power up and down 4 times to be certain. OK
	05:45	06:35	Pick up from deck back up top section units of tool string (swivel, jar TTRM)
	06:35	07:10	Vertical check on tool, comms with top GR ok but no comms with the lower part of string.
	07:10	07:30	Continue troubleshooting, think plan on lifting tool string, handover.
	07:30	08:20	Open calipers inside 13 3/8" casing for caliper check - OK
	08:20	09:10	Rig down MREX and go w/EI standalone after decision taken by Sterling to stop troubleshooting.
	09:10	09:20	EI vertical check-ok
	09:20	09:30	RIH to 300 ft, set compensator.
	09:30	10:30	Tool at casing shoe, run in open hole at 145 ft/min.
	10:30	11:35	Tool at 12170 ft. Tool hangs at 11020 ft and 11089 ft, passed after changing running speed.
	11:35	12:05	Completed repeat pass 12100-11900 ft at 9 ft/min.
	12:05	12:15	Depth shift 8 ft, tool on depth, run to 12200 ft, commence main up log at 9 ft/min.
	12:15	13:55	Complete main up log at 11320 ft, close pads. From 11725 ft observed lower pressure on pad 1 (high side of the hole). Data will be re-processed in town.
	13:55	14:00	Run in hole to 11887 ft to fix mis-alignment spool on drum, pull out
	14:00	14:56	Tool inside casing. Stop for caliper check, +0.15in (inside the tolerance limits). Continue pulling.
	14:56	15:30	Compensator off at 300 ft.
	15:30	15:40	Tool at surface. TBT and swap to WREX.
	15:40	16:10	EI rigged down. Go for MREX run. The after calibration on orientation to be performed after MREX run

			Run #1c MREX - GR
9-Apr-11	16:10	16:40	Pick up MREX, connect cableahead
	16:40	17:15	Check tool-ok, zero tool at TTRM,RIH
	17:15	17:25	Set compensator at 316.6 ft (-16 ft to reset), cont RIH
	17:25	18:10	Tool passing casing shoe, frequency sweep of MREX.
	18:10	19:25	Continue RIH, hangs at: 8700ft, (+1000lbs overpull); 8987ft; 9122ft; 11988ft
	19:25	19:30	Tool calibration
	19:30	19:38	Correlate GR 11978 to 11830ft
	19:38	19:40	Spooling problem
	19:40	19:45	Correlate GR again 11960 to 11855ft
	19:45	19:48	Start to RIH to 12190ft
	19:48	19:55	11830 to 11897, hanging up /stuck problems
	19:55	20:05	At 12190ft Start repeat log 3.5-4 ft/hr
	20:05	20:22	Abort log due to problem with tool pulses, shut down toll and start up again
	20:22	20:51	Re start repeat from 12145ft 4.5ft /min
	20:51	21:15	Experience O/P at 12.035, 11933, and 11928ft
	21:15	21:25	Stuck at 11928ft, pulled 10,000lbs, broke weak link, may have popped the jars.
	21:25	22:06	Re-set compensator and discuss with town to make this main log and not go down again, means gap of 40-50ft in log
	22:06	22:15	Correlate log again add 1.5ft
	22:15	22:20	RIH to 11900ft continue main pass
	22:20	22:27	Tool not working, start up again
	22:27	22:32	RIH to 11900ft continue main pass
	22:32	22:33	Start log up , possibly 1ft off depth, data starts again from 11871ft
	22:33	0:00	Continue main log up; OK, gap 11,919 to 11,871ft
10-Apr-11	00:00	1:15	Main log complete to 11,320ft
	01:15	1:20	Commence repeat, Repeat section 11,650 to 11,450ft
	01:20	2:33	Repeat complete.
	02:33	02:44	After verifications
	02:44	2:45	Commence POOH with MREX tool
	02:45	4:25	Compensator off
	04:25	4:30	Commence tool rig down
	04:30	5:40	Rig down complete.
			Run #1d RCI
10-Apr-11	05:45	06:00	Start to pick up tools
	06:00	07:20	Start check tools and shift handover.
	07:20	08:00	Complete checking tools, RIH
	08:00	08:06	Compensator set
	08:06	08:17	RIH
	08:17	08:55	At shoe, wait for stabilisation
	08:55	09:19	Tool Temp stable (0.25degf/min)
	09:19	10:15	Correlation; 11525ft add 13.5ft
	10:15	10.:29	Sticking test at first point 11549.5, No problem
	10.:29	10:43	Drill floor had to pump up compensator, Re-do stick test.11549ft. OK
	10:43	10:53	Drop down and log up to check depth. Ok
	10:53	10:57	Start pressure tests 11549.5ft
	10:57	12:23	5 test attempted,4 good, 1 tight.
	12:23	12:37	Correlation pass--on depth
	12:37	15:30	Continue pressure point tests, 10 points, 7 tight, 2 good, 1 building.
	15:30	15:39	Correlation; at 12080ft add 0.5ft
	15:39	17:32	Continue pressure point tests, 9 points, 5 tight, 2 good,(one aborted) 1 building.
	17:32	17:34	Check depth after pump up compensator, On depth.
	17:34	18:37	Continue pressure tests, 8 attempts, all tight
	18:37	19:10	Correlation at 12050ft add 2 ft
	19:10	19:15	On depth 12002.6ft
	19:15	19:25	Get on proper sampling depth 12002ft
	19:25	21:50	Start pump out and clean up
	21:50	22:20	94% confident that it is 95% clean,reduce pump rate for final 5 litres. Pumped 92.5litres
	22:20	22:35	First 884cc tank filled
	22:40	22;50	Second tank filled
	22:50	22:52	Move tool to next station 12020.5ft
	22:52	22:58	Correlate GR on way to station
	22:58	23:40	Attempt to sample at 12020.5ft (mob 10.7), 12020ft (mob 8) 12021ft (mob) abort , too tight.
	23:40	23:45	At station12023ft- mobility 25.
	23:45	00:00	Start pump out and clean up
11-Apr-11	00:00	03:06	Continue clean up prior to sampling, high confidence >95% clean
	03:06	03:12	Fill tank #3, 840cc
	03:15	03:20	Fill tank #4, 840cc
	03:20	03:25	Pull off station OK
	03:25	03:30	Correlate on way up to station #3 at 11565ft, add 2.5ft.
	03:30	03:45	Move to station, pretest not stabilising, but mobility looks reasonable, decide to clean up rather than move
	03:45	08:05	Start clean up at 11565ft. At 07:38-07:47 filled bottle #5&6, 95% estimated cleaning, temp 213.8 deg F. Start pulling , looks like keyseat or stuck above CHT. Pulled 10000lbs, free, cont pulling.
	08:05	09:10	Tool inside casing.
	09:10	09:52	Tool at 300ft, take off compensator.
	09:52	10:10	TBT, stop compensator and POOH to surface
	10:10	12:30	Flush through the tool, rigged down the tools.
	12:30	12:45	Rig down wireline, well to client.
			Logging: 81 hours 55 minutes
			Lost time: 6 hours
			Total: 87 hours 55 minutes

INSTRUMENT CONFIGURATION

Source File: /data/11075-2/slam_flx-tdg

MECHANICAL RELEASABLE CABLEHEAD
- Diameter : 3.38"
- Length : 4.39'
- Weight : 48 lbs
- Series : 4460MA

MECHANICAL RELEASABLE CABLEHEAD ELEC
- Diameter : 3.38"
- Length : 1.88'

SWIVEL
- Diameter : 3.38"
- Length : 3.33'
- Weight : 66 lbs
- Series : 3944XB

DOWNHOLE POWER ADAPTER
- Diameter : 3.62"
- Length : 5.27'
- Weight : 86 lbs
- Series : 4430XB

ROLLER
- Diameter : 3.38"
- Length : 3.33'
- Weight : 70 lbs
- Series : 3927NA

EVANS WIRELINE JAR
- Diameter : 3.50"
- Length : 10.96'
- Weight : 287 lbs
- Series : EVAJAR

ROLLER
- Diameter : 3.38"
- Length : 3.33'
- Weight : 70 lbs
- Series : 3927NA

TTRM SUB
- Diameter : 3.63"
- Length : 3.83'
- Weight : 62 lbs
- Series : 3981XA

WTS COMMON REMOTE
- Diameter : 3.63"
- Length : 6.36'
- Weight : 126 lbs
- Series : 3514XB

DIGITAL SPECTRALOG
- Diameter : 3.63"
- Length : 7.31'
- Weight : 130 lbs
- Series : 1329XA

COMPENSATED NEUTRON
- Diameter : 3.63"
- Length : 7.59'
- Weight : 150 lbs
- Series : 2446XA

Z-DENSILOG
- Diameter : 4.88"
- Length : 11.22'
- Weight : 360 lbs
- Series : 2234XA

FORMATION LITHOLOGY EXPLORER
- Diameter : 4.88"
- Length : 15.57'
- Weight : 273 lbs
- Series : 1338XA

KNUCKLE JOINT (DOUBLE)
- Diameter : 3.38"
- Length : 4.65'
- Weight : 90 lbs
- Series : 3939XA

ARRAY ACOUSTILOG ELECTRONICS, 8 CHANNEL
- Diameter : 3.38"
- Length : 7.82'
- Weight : 102 lbs
- Series : 1677EA

CROSS MULTIPOLE ARRAY ACOUSTILOG
- Diameter : 3.75"
- Length : 10.91'
- Weight : 224 lbs
- Series : 1678MC

SHEAR WAVE ACOUSTILOG
- Diameter : 3.63"
- Length : 5.00'
- Weight : 135 lbs
- Series : 1678PB

MULTI-POLE ARRAY ACOUSTIC
- Diameter : 3.88"
- Length : 7.92'
- Weight : 170 lbs
- Series : 1678BA

MULTI-POLE ARRAY ACOUSTIC
- Diameter : 3.38"
- Length : 4.32'
- Weight : 58 lbs
- Series : 1678FA

HIGH DEFINITION INDUCTION TOOL
- Diameter : 3.62"
- Length : 27.13'
- Weight : 415 lbs
- Series : 1515XA

SHEAR WAVE ACOUSTILOG
- Diameter : 3.63"
- Length : 5.00'
- Weight : 135 lbs
- Series : 1678PB

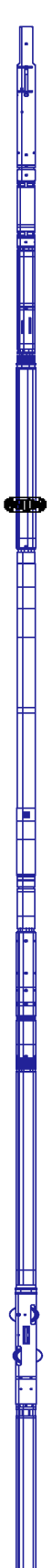
WTS ROLLER
- Diameter : 3.67"
- Length : 3.40'
- Weight : 70 lbs
- Series : 3928NA

BULL PLUG 3 3/8

TOTAL LENGTH: 160.81'
TOTAL WEIGHT: 3220 lbs
MAX DIAMETER: 0'8.50"

INSTRUMENT CONFIGURATION

Source File: /data/11075-2/ei-tdg



98.97'

MECHANICAL RELEASABLE CABLEHEAD
- Diameter : 3.38"
- Length : 4.39'
- Weight : 48 lbs
- Series : 4460MA

MECHANICAL RELEASABLE CABLEHEAD ELEC
- Diameter : 3.38"
- Length : 1.88'

SWIVEL
- Diameter : 3.38"
- Length : 3.33'
- Weight : 66 lbs
- Series : 3944XB

DOWNHOLE POWER ADAPTER
- Diameter : 3.62"
- Length : 5.27'
- Weight : 86 lbs
- Series : 4430XB

EVANS WIRELINE JAR
- Diameter : 3.50"
- Length : 10.96'
- Weight : 287 lbs
- Series : EVAJAR

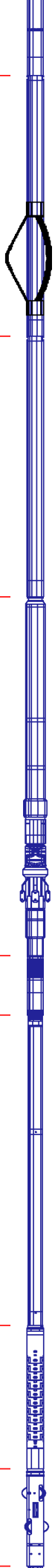
TTRM SUB
- Diameter : 3.63"
- Length : 3.83'
- Weight : 62 lbs
- Series : 3981XA

TEMP MP 70.69'
RM MP 70.44'

WTS COMMON REMOTE
- Diameter : 3.63"
- Length : 6.36'
- Weight : 126 lbs
- Series : 3514XB

WTS ROLLER
- Diameter : 3.67"
- Length : 3.40'
- Weight : 70 lbs
- Series : 3928NA

DIGITAL SPECTRALOG
- Diameter : 3.63"
- Length : 7.31'
- Weight : 130 lbs
- Series : 1329XA



GR MP — 53.84'

PAD MP — 24.88'

ORIENT MP — 8.68'

C6PC IMAGER POWER SUPPLY
Diameter : 3.62"
Length : 9.08'
Weight : 116 lbs
Series : 1022PA

C6PC IMAGER ELECTRONICS
Diameter : 3.62"
Length : 9.08'
Weight : 94 lbs
Series : 1036EA

C6PC IMAGER MANDREL
Diameter : 5.25"
Length : 12.50'
Weight : 278 lbs
Series : 4236MA

ISOLATION RETURN SUB
Diameter : 3.63"
Length : 2.08'

DIGITAL ORIENTATION
Diameter : 3.38"
Length : 10.81'
Weight : 110 lbs
Series : 4401XB

SHEAR WAVE ACOUSTILOG
Diameter : 3.63"
Length : 5.00'
Weight : 135 lbs
Series : 1678PB

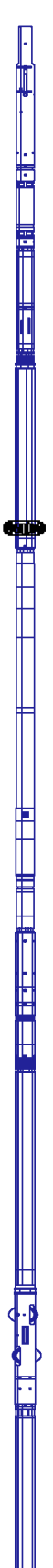
WTS ROLLER
Diameter : 3.67"
Length : 3.40'
Weight : 70 lbs
Series : 3928NA

BULL PLUG 3 3/8

TOTAL LENGTH: 98.97'
TOTAL WEIGHT: 1748 lbs
MAX DIAMETER: 0'8.50"

INSTRUMENT CONFIGURATION

Source File: /data/11075-2/mrex-tdg



MECHANICAL RELEASABLE CABLEHEAD
- Diameter : 3.38"
- Length : 4.39'
- Weight : 48 lbs
- Series : 4460MA

MECHANICAL RELEASABLE CABLEHEAD ELEC
- Diameter : 3.38"
- Length : 1.88'

SWIVEL
- Diameter : 3.38"
- Length : 3.33'
- Weight : 66 lbs
- Series : 3944XB

DOWNHOLE POWER ADAPTER
- Diameter : 3.62"
- Length : 5.27'
- Weight : 86 lbs
- Series : 4430XB

EVANS WIRELINE JAR
- Diameter : 3.50"
- Length : 10.96'
- Weight : 287 lbs
- Series : EVAJAR

TTRM SUB
- Diameter : 3.63"
- Length : 3.83'
- Weight : 62 lbs
- Series : 3981XA

WTS COMMON REMOTE
- Diameter : 3.63"
- Length : 6.36'
- Weight : 126 lbs
- Series : 3514XB

WTS ROLLER
- Diameter : 3.67"
- Length : 3.40'
- Weight : 70 lbs
- Series : 3928NA

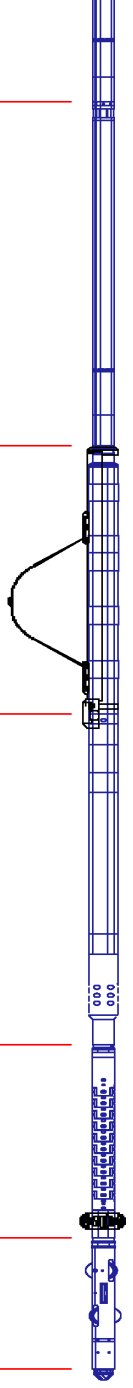
DIGITAL SPECTRALOG
- Diameter : 3.63"
- Length : 7.31'
- Weight : 130 lbs
- Series : 1329XA

Series : 1329XA

GR MP — 34.68'

MREX CAPACITOR CHARGER SUB
Diameter : 3.62"
Length : 8.90'
Weight : 176 lbs
Series : 3218QA

MREX ELECTRONICS
Diameter : 5.00"
Length : 6.95'
Weight : 178 lbs
Series : 3218EB



MREX MAGNET
Diameter : 5.00"
Length : 8.56'
Weight : 310 lbs
Series : 3218MB

ANTENNA — 13.61'

SHEAR WAVE ACOUSTILOG
Diameter : 3.63"
Length : 5.00'
Weight : 135 lbs
Series : 1678PB

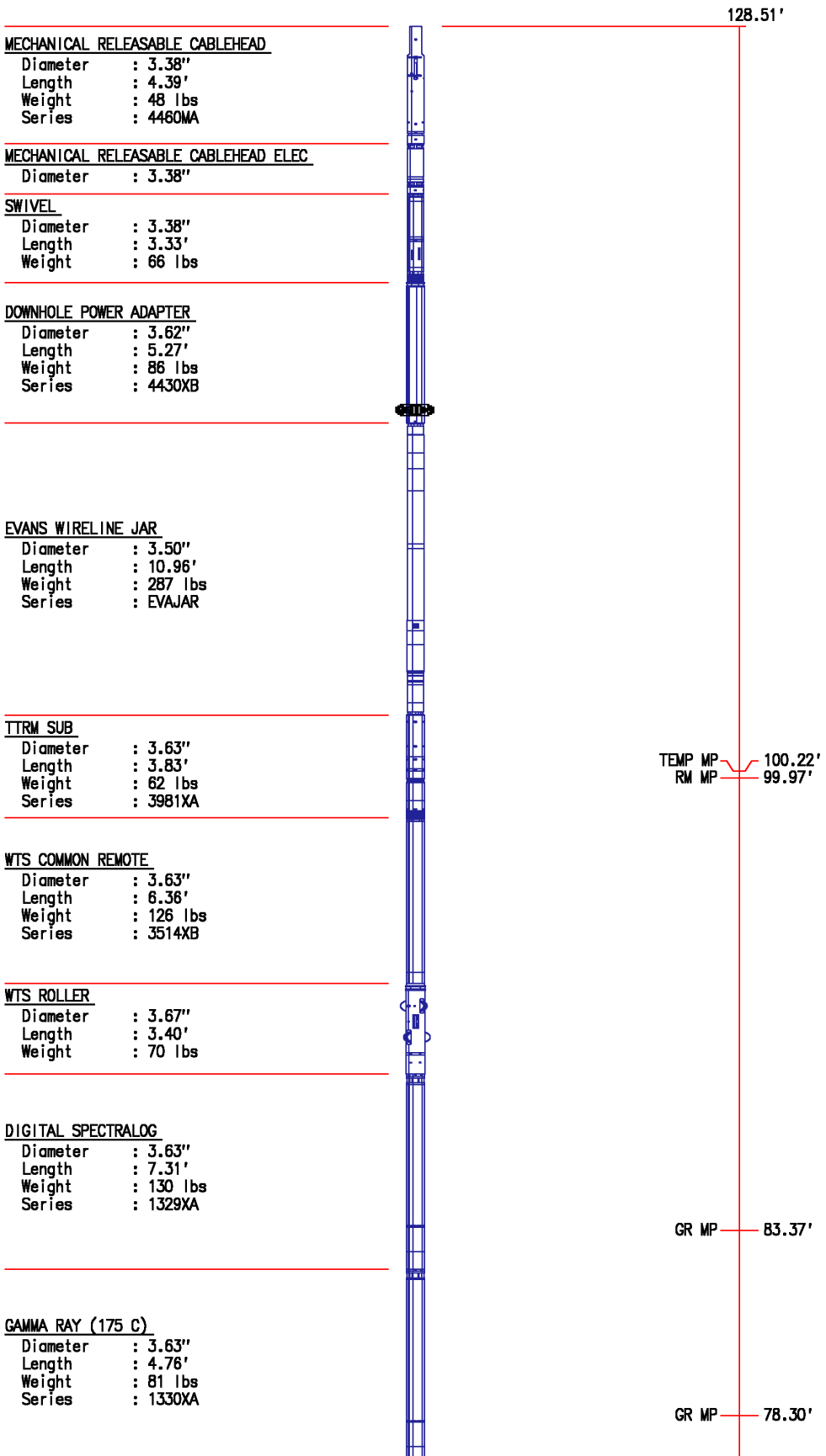
WTS ROLLER
Diameter : 3.67"
Length : 3.40'
Weight : 70 lbs
Series : 3928NA

BULL PLUG 3 3/8 — 0.00'

TOTAL LENGTH: 79.82'
TOTAL WEIGHT: 1799 lbs
MAX DIAMETER: 0'8.50"

INSTRUMENT CONFIGURATION

Source File: /dat1a/11075-2/rci-tdg



MECHANICAL RELEASABLE CABLEHEAD
- Diameter : 3.38"
- Length : 4.39'
- Weight : 48 lbs
- Series : 4460MA

MECHANICAL RELEASABLE CABLEHEAD ELEC
- Diameter : 3.38"

SWIVEL
- Diameter : 3.38"
- Length : 3.33'
- Weight : 66 lbs

DOWNHOLE POWER ADAPTER
- Diameter : 3.62"
- Length : 5.27'
- Weight : 86 lbs
- Series : 4430XB

EVANS WIRELINE JAR
- Diameter : 3.50"
- Length : 10.96'
- Weight : 287 lbs
- Series : EVAJAR

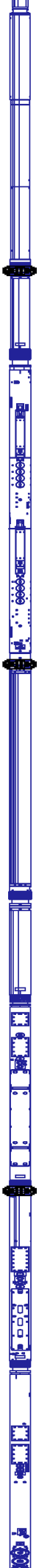
TTRM SUB
- Diameter : 3.63"
- Length : 3.83'
- Weight : 62 lbs
- Series : 3981XA

WTS COMMON REMOTE
- Diameter : 3.63"
- Length : 6.36'
- Weight : 126 lbs
- Series : 3514XB

WTS ROLLER
- Diameter : 3.67"
- Length : 3.40'
- Weight : 70 lbs

DIGITAL SPECTRALOG
- Diameter : 3.63"
- Length : 7.31'
- Weight : 130 lbs
- Series : 1329XA

GAMMA RAY (175 C)
- Diameter : 3.63"
- Length : 4.76'
- Weight : 81 lbs
- Series : 1330XA



RCI HYDRAULIC POWER SECTION (F. D.)
Diameter : 4.75"
Length : 10.86'
Weight : 250 lbs
Series : 1970CB

RCI ELECTRONICS SECTION
Diameter : 4.38"
Length : 3.67'
Weight : 100 lbs
Series : 1970EB

RCI SIX TANK SECTION WA W/TANKS
Diameter : 4.75"
Length : 12.92'
Weight : 398 lbs
Series : 1970WA

RCI FLUID CHARACTERIZATION WITH FLUOR
Diameter : 4.87"
Length : 10.15'
Weight : 200 lbs
Series : 1970IB

RCI AUX POWER SECTION
Diameter : 4.87"
Length : 4.38'
Weight : 136 lbs
Series : 1970OB

RCI SAMPLE PUMPTHRU SECTION (500 CC)
Diameter : 4.75"
Length : 7.89'
Weight : 250 lbs
Series : 1970RB

RCI DRAW DOWN SECTION (56.7 CC)
Diameter : 4.75"
Length : 7.67'
Weight : 250 lbs
Series : 1970BB

RCI SINGLE PACKER SECTION (STD)
Diameter : 4.75"
Length : 9.54'
Weight : 342 lbs
Series : 1970MB

PACKER MP — 11.19'

RCI WTS CROSSOVER SUB

SHEAR WAVE ACOUSTILOG
- Diameter : 3.63"
- Length : 5.00'
- Weight : 135 lbs
- Series : 1678PB

ROLLER
- Diameter : 3.38"
- Length : 3.33'
- Weight : 70 lbs

BULL PLUG 3 3/8

0.00'

TOTAL LENGTH: 128.51'
TOTAL WEIGHT: 3178 lbs
MAX DIAMETER: 0'8.50"