



STERLING RESOURCES (UK) LTD

WELL: 210/30a-4Y Cladhan

APPRAISAL

WELLSITE GEOLOGICAL REPORT

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1. INTRODUCTION

The Cladhan 210/30a-4Y well was planned as a sidetrack appraisal well located in Quad/Block 210/30a of the Northern North Sea.

The Cladhan discovery 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 discovery comprises a stratigraphic trap of slump/channel sandstones of Late Oxfordian to Late Kimeridgian age, pinching out within the Kimmeridge Clay Formation.

The Cladhan reservoir has been penetrated by five previous wells. These were 210/29a-4 in 2008 and subsequent sidetracks 210/29a-4Z and 4Y in 2010. Most recently 210/30a-4 was drilled in 2011. On completion this well was sidetracked to 210/30a-4Z. 201/30a-4Y well is the second sidetrack from the donor well 210/30a-4.

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 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 up-dip and are encased in the black shales and claystones of the Kimmeridge Clay Formation.

The source of the hydrocarbons are 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 Clay Formation 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 location for the proposed C2 210/30a-(4Y) well targets the central channel, up dip and to the south of the 210/30a-4 reservoir target.

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

Other sand intervals were encountered in the original discovery well 210/29a-4 and were referred to as Sequence 2A/2B. Sequence 2A was tightly cemented and Sequence 2B was water wet and normally pressured. The most recent well 210/30a-4 also encountered thin (17 ft AVT) sand in a stratigraphical similar position as the Sequence 2 and is hydrocarbon bearing.

The proposed target coordinates for the well at the top of Sequence 1 was:

- shallow

Latitude 61° 06' 44.709" N Longitude 00° 48' 14.603" E

-deep

Latitude 61° 06' 41.741" N Longitude 00° 48' 13.070" E

The well was planned as a deviated well with an inclination of 62.16° and an azimuth of 195.96° deg on tangent section from 8200 ft MDRT to TD.

Last active survey at 12545 ft MDBRT showed: inclination 60.96° , azimuth 195.78° , TVDBRT 9852.53 ft (-9779.53 ft TVDSS).

The well TD was prognosed at 12621 ft MDRT (-9812 ft TVDSS) which was anticipated to be +/- 150 ft MDRT below the base of the Sequence 1 into the underlying Kimmeridge Clay Formation.

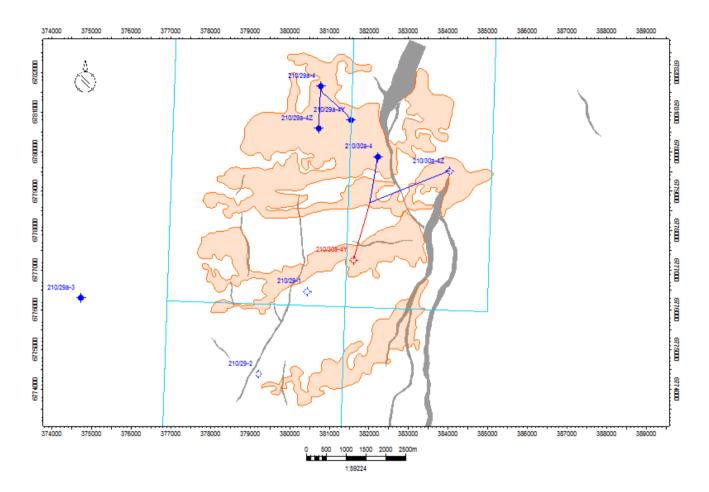
The base of the Sequence 1 was intersected at 12468 ft MDRT (-9743 ft TVDSS). This was 2 ft shallower than expected. Well reached TD of 12615 ft (-9813.6 ft TVDSS) on 7th of May 2011.

1.1 Primary Objectives

- Drill the well with no recordable accidents and environmental incidents
- Establish the presence of hydrocarbon bearing sands up dip of the present well penetrations
- Possible objective: Acquire 120 ft core if hydrocarbon bearing formation is encountered
- Acquire both pressure and sample data, across any sand intervals encountered in the Kimmeridge Clay Formation regardless of fluid type encountered
- 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 tools to pass below any recorded hydrocarbon bearing formation
- Depth tie in with logging tools essential at 13 3/8" casing shoe, therefore a GR must be obtained from inside casing shoe to RD

2. LOCATION MAP

The 210/30a-4Y well is located on Cladhan prospect 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.



Location Map for 210/30a-4Y

3. WELL DATA SUMMARY

Well:	210/30a-4Y
Pre-spud designation:	Drill a deviated well as sidetrack from the donor well 210/30a-4 to establish the presence of hydrocarbons in the Cladhan reservoir up dip of previous drilled 210/30a wells. Evaluation of the reservoir with conventional coring, 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	Latitude: 61° 06' 38.827" N
Coordinates	Longitude: 00° 48' 11.565" E
	X UTM: 381 608.45 m E
	Y UTM: 6 777 275.63 m 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:	7 th May 2011
TD Reached:	15 th May 2011
Total depth:	12615 ft MDBRT (-9814ft TVDSS)

HOLE SIZE and CASING DATA

Hole Size (in)	Depth (ft MDRT)	Casing Shoe (ft MDRT)	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"	12615			

BIT DATA

Bit Run	Туре	Size (in)	Depth in (ft)	Depth out (ft)	Footage (ft)
10	HC QD506X	12 ¼"	6080	12039	5959
11	Smith MDSi716LBPX	12 ¼"	12039	12615	576

MUD SYSTEM: MI SWACO

		12	2 ¼" Hole Se	ction drilled w	vith VERSA	CLEAN OBN	1 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 %
6097	11.95	59	30/24	16/21/22	3	2	18.72	660	68/32
6689	12	55	23/23	13/19/20	2	2	18.59	687	69/31
7239	12	54	24/20	14/19/20	1.8	2	18.83	701	70/30
7835	12	54	25/22	14/19/20	1.8	2	19.56	661	69/31
8920	12.05	50	25/22	14/19/20	1.5	2	19.49	726	69/31
9371	12.1	50	25/22	14/19/20	1.5	2	20.48	741	70/30
10300	12.15	51	23/22	14/19/20	1.8	2	20.48	657	71/29
10899	12.7	53	26/21	13/19/20	1.7	2	21.47	688	71/29
11264	13.2	53	31/21	14/19/20	1.7	2	23.14	613	71/29
11889	13.45	55	33/22	13/18/19	1.8	2	24.69	603	70/30
11968	13.45	52	32/20	13/18/19	1.5	2	24.67	696	70/30
12039	13.45	52	34/23	14/19/20	1.5	2	24.71	708	70/30
12208	13.4	51	36/22	14/19/20	1.5	2	26.45	678	71/29
12354	13.5	56	35/24	13/17/18	2	2	26.68	671	71/29
12547	13.45	54	37/25	14/18/19	2.1	2	26.63	681	71/29
12610	13.4	54	37/25	14/18/19	1.8	2	26.63	684	71/29

MEASUREMENT WHILE DRILLING LOGS: BHI

Hole Size (in)	Run no.	Tools Run/Curves	n/Curves Interval Date Logged (ft) In-Out		Comments
12 ¼"	11	ATK-OTK2-LTK + Sonic (NB Incl /Res /ECD /GR /Dir/Cal/Dens/Neutron/ Sonic)	6060.0 – 12004.9	07/05/11 - 12/05/11	Good run with no issues. Sonic in memory mode only.
12 ¼"	12	OTK1-LTK +Sonic (Res/ECD/GR/Dir/Cal/De ns/Neutron/Sonic)	12004.9- 12566.4	13/05/11 - 16/05/11	Good run with no issues. Sonic in memory mode only.
12 ¼"	4	Pathfinder RCI Sonic	6015 - 11941		
12 ¼"	5	Pathfinder RCI Sonic	11914-12493		

WIRELINE LOGGING: BHI - Baker Atlas

Hole Size (in)	Run no.	Tools Run	Interval Logged (ft)	Date In-Out	Comments
12 ¼"	#1a	Baker Atlas / RCI pressures & samples	12454 – 11951.3	16-18/05/11	RCI-Pretests in interval 12454 ft to 11951.3 ft: 26 total-9 good, 6 tight, 3 supercharged, 3 lost seal, 5 insufficient drawdown and 2 sampling depths. DSL interval: 12535 ft to 11428 ft GR Interval: 11428 ft to 5852 ft
12 ¼"	#1a	Baker Atlas / GR	12537 - 5915	16-18/05/11	E-Line

Logs witnessed by Gaia Earth Sciences Ltd specialist

CUTTINGS SAMPLES

Hole Section	Washed & Dried Samples	Bulk Wet Samples	Sample Interval
12 ¼" section to TD	2	2	20 ft composite sample

See APPENDIX A: BHI mudlogging Shipping Manifest 210-30a-4Y

SAMPLE DESTINATIONS:

One set of wet / dry to be sent to:

CORPRO Muirtonside Whitecairns Aberdeenshire AB23 8UP

Contact: Dick Patterson Tel: (+ 44) (0)1651 863000 Email: ops@corpro.co.uk

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

One set of wet / dry to be sent to:

British Geological Survey

NGDC,

Kingsley Dunham Centre,

Keyworth, Nottingham, NG12 5GG

Contact: Scott Renshaw Tel: 0115 9363 228

4. FORMATION TOPS

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

	Prog	nosis	Uncert.	Act	tual	Difference
Wellsite Tops (provisional only)	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
KOP (from donor well 210/30a-4)	6100	-6020	100	6080	-6007	-13
Early Cretaceous Undifferentiated	10434	-8778	150	10206	-8682	-96
Jurassic Kimmeridge Clay formation	11583	-9300	100	11545	-9305	+5
Top Sequence 2B	11819	-9433	150	11949	-9494	+61
J66 MFS				12026	-9531	
Top Sequence 1 (shallow)	11931	-9486	150			
Top Sequence 1 (deep)	12277	-9650	150	12217	-9622	-28
Base Sequence 1	12470	-9741	150	12468	-9743	+2
TD	12639	-9812	-	12615	-9814	+2

5. LITHOSTRATIGRAPHY

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

Lithological descriptions from 6080 ft (Kick off point) to TD at 12615 ft are based on cutting samples examined at the wellsite. Samples were collected as follow:

• 20 ft intervals from 6080 ft to 12615 ft – 12 ¼" section. Additionally spot samples were collected as per request.

Formation tops on the lithology log were picked on MWD logging tool responses and cuttings examination along with gas shows.

LATE CRETACEOUS
Undifferentiated

6080 (KOP) – 10206 ft MDRT 6007 – 8682 ft TVDSS

The lithology comprised of massive claystones with inter-bedded thin limestone and dolomite stringers throughout. Minor sandstone stringers were also observed. The top of the section was not seen in this well as it was kicked off within the Late Cretaceous. The main part of the section consisted of medium to dark grey to greyish black claystones with thin limestone/dolomite stringers interspersed. A thin reddish band was noted from 6440 ft to 6510 ft and a thin blocky Limestone, which is traceable to other Cladhan wells, was intersected from 8405 ft to 8443ft. This seems to correspond to a change from common dolomitic stringers above to predominantly limestone stringers below.

In the basal section, the lithology was represented by medium grey claystones with more numerous interbedded limestone stringers.

Upper Section

Claystone: medium grey to dark grey, olive grey, dark brown grey,

rare pale green grey, sub-blocky, slightly to moderately calcareous, soft to moderately hard, micro-micaceous,

disseminated pyrite.

Sandstone: very light grey to medium grey, translucent in places,

very fine, well sorted, sub-angular to sub-rounded, spherical, firm, friable, poorly to moderately cemented, slightly calcareous cement / argillaceous matrix, poor

visual porosity.

Limestone: mudstone, greyish orange, pale yellowish orange,

white-off white, rare greyish orange pink and light brown, firm, crumbly, sub-blocky to blocky, rare argillaceous, crypto to micro-crystalline, occasionally

dolomitic.

Dolomite:

dark yellowish orange, dusky yellow, light brown, firm to moderately hard, crumbly in places, blocky, crypto to micro-crystalline, argillaceous with common argillaceous streaks, slightly silty in places.

Lower section

Claystone: medium grey to medium dark grey, light grey to

medium light grey in places, predominantly firm to very firm, soft, plastic and sticky when light, sub-blocky to blocky, slightly to moderately calcareous, calcareous in

places, grading marl, slightly micromicaceous.

Sandstone: light brown, light grey, crumbly, calcareous, colourless

to cloudy white grains, very fine, sub-rounded,

glauconitic.

Limestone: off white, blocky, brittle, angular, mudstone, chalky,

micro to cryptocrystalline, no visible porosity. General dull yellow even fluorescence, spots moderately bright yellow, slow streaming blue white cut, masked by OBM. Also: mudstone, greyish orange, light brown, very pale orange in places, occasionally vitreous, firm to moderately hard, blocky, crypto to micro-crystalline, argillaceous in places, dolomitic in places grading

dolomitic limestone.

Dolomite: dark yellowish orange, dusky yellow, light brown, firm

to moderately hard, crumbly in places, blocky, crypto to micro-crystalline, argillaceous with common

argillaceous streaks, slightly silty in places.

Depth		BACKGROUND GAS								
Interval	Min	Max	Avg	C1	C2	C3	iC4	nC4	iC5	nC5
ft MDRT	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
L. Cretaceous Undiff.	ROP: m	ROP: min/max/avg – 13.2/440/132								
6080 - 8405	0.16	0.27	0.23	625	Tr-5	0	0	0	0	0
8405-10206	0.25	0.37	0.30	571	7	3	Tr	Tr	Tr	Tr

Depth		GAS PEAKS										
ft MDRT	Background	Max	C1	C2	C3	iC4	nC4	iC5	nC5	Type		
	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm			
8445	0.26	0.45	1726	23	11	5	11	6	8	FG		

Legend:

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

EARLY CRETACEOUS Undifferentiated

10206 – 11545 ft MDRT 8682 – 9305 ft TVDSS

The Early Cretaceous was picked on an increasing trend in gamma log response and a shift on porosity curve. This coincided with an increase in rate of penetration, 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 90api GR trend with the lower section averaging 75api. In addition, a sandy/limestone interbedded interval was encountered at around 10700 ft that was accompanied by a notable increase in both overall gas levels and the appearance of heavier gases upon entering the lower section. This interbedded sequence was also observed in 210/30a-4 and 4Z wells. The lithology of both sections comprises of massive claystone beds and thin limestone/dolomite stringers, with a notable increase in limestone when approaching the base of the section below 11300 ft. There was a notable change in the nature of the claystones below 10700 ft that become predominantly calcareous (marly) and reddish brown towards base of the section.

Above 10700 ft MDRT

Claystone: varicoloured, medium grey to medium dark grey, olive

grey, medium light grey to medium light greenish grey, reddish brown, blocky, firm, rarely soft, non to moderately calcareous, slightly silty in places, slightly

micromicaceous.

Sandstone: very light brown, greyish orange, very fine to silty, well

sorted, firm, friable, moderately cemented with moderately calcareous cement, non to poor visual

porosity.

Limestone: mudstone, greyish orange, very pale orange, dark

yellowish orange, firm to moderately hard, crumbly, brittle in places, blocky, crypto to microcrystalline,

argillaceous in places.

Below 10700 ft MDRT

Claystone: medium dark grey to brownish grey, olive grey, firm to

moderately firm, blocky to sub-blocky, sub-platy in places, moderately calcareous to calcareous (marly), slightly to moderately silty, silty in places grading silty claystone, slightly micromicaceous. Also towards base interval: varicoloured, predominantly red brown to moderate brown, with medium to dark grey, rarely

black, increasingly very light grey to white grey, very pale green, very soft to occasionally firm, rarely very firm, sub-blocky, sticky in places, commonly plastic to crumbly, very calcareous, marly, often mottled, pyrite nodules.

Siltstone: medium grey to medium greenish grey, friable, blocky,

moderately calcareous to calcareous, argillaceous.

Sandstone: very light grey, off white, light greenish grey to greenish

grey, common dark spotted, translucent in places, very fine, well sorted, sub-angular to sub-rounded, common spherical, firm, friable, moderately hard in places, poorly to well cemented, moderately calcareous cement, micromica in places, poor visual porosity, no

shows.

Limestone: mudstone-wackestone, varicoloured, greyish orange to

dark yellowish orange, dusky yellow, light brown, pale yellowish brown in places, firm to moderately hard, friable in places, crumbly, crypto to micro-crystalline, argillaceous with common argillaceous / carbonaceous

streaks and laminations, silty/sandy in places.

Depth		BACKGROUND GAS										
Interval ft MDRT	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm		
L. Cretaceous Undiff.	ROP: m	OP: min/max/avg – 23/268/149										
10206 - 10700	0.28	0.33	0.30	664	9	5	0	0	0	0		
10700- 11545	0.25	0.35	0.30	536	14	20	4	9	4	2		

Depth		GAS PEAKS											
ft MDRT	Background	Max	C1	C2	C3	iC4	nC4	iC5	nC5	Type			
	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm				
10737	0.30	0.50	1984	64	118	14	55	12	16	FG			

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

> 11545 – 12615 ft MDRT TD 9305 – 9814 ft TVDSS TD

The Upper Jurassic-Kimmeridge Clay Formation was evident from incoming dark carbonaceous claystone with associated typical signature: a high increase in GR values ("hot shales") and shifting in density, porosity and sonic curves. The Jurassic formation saw an increase in the background gas that displayed the characteristic presence of heavy hydrocarbons C3 to C5, from 0.30 % in Lower Cretaceous formation to 0.8-1.0 % through the carbonaceous claystone of the upper section of the Kimmeridge Clay Formation.

The lithology consists of massive claystones with intercalations of sandstone and locally siltstone thin to well developed beds throughout. In the basal section the formation becomes predominantly silty argillaceous with minor sandstone/siltstone and rarely dolomite stringers. The Cladhan structure omnipresent highly gamma ray J66 marker was picked up at 12026 ft MDRT (-9531 ft TVDSS)

Claystone:

brownish black to olive black, dark grey brown, dusky yellow brown, firm to hard, sub-blocky to blocky, crumbly, earthy, moderately silty in places, non calcareous, occasionally micromicaceous, pyrite nodules, disseminated micro-pyrite, occasional carbonaceous flakes.

Towards end of the section, the claystone becomes brownish and predominantly silty: dark grey to dark brownish grey, dark yellowish brown, rare greenish grey, firm friable, sub-blocky to blocky, very slightly to slightly calcareous, silty, grading silty claystone, micromicaceous in places.

Siltstone:

light grey, brownish grey, dark yellowish brown, friable, blocky, firm, crumbly, non to slightly calcareous, grading to very fine sandstone in places.

Sandstone:

very light grey, off white-white, translucent in places, common dark streaks and laminations, predominantly as rock flour, very fine, moderately to well sorted, subrounded to rounded, spherical, firm-friable, moderately cemented, slightly to moderately calcareous cement, non to poor visual porosity. Also: light grey, off white-white, brownish grey in places, rare translucent, seen as rock flour, very fine to fine, firm-friable, poorly to moderately cemented, slightly to moderately calcareous cement, argillaceous matrix when brown, no visual porosity, shows: patchy dull yellowish brown

direct UV, slow streaming dull vellowish white cut

colour.

Dolomite: brownish grey, moderate yellowish brown, hard,

blocky, micro-crystalline, trace calcite.

Two sandstone units were developed within Kimmeridge Clay Formation

Sequence 2: 11949 ft-12009 ft MDRT (9494 ft – 9523 ft) Alternating beds of sandstone and claystone with minor siltstone stringers.

Claystone: brownish grey, dark yellowish brown, moderate brown,

> occasionally light bluish grey, firm, sub-blocky to blocky, sub-platy in places, non calcareous, common silty

grading silty claystone, slightly micromicaceous.

Siltstone: brownish grey, moderate brown, dark spotted in places,

> firm-friable, blocky, very slightly calcareous, argillaceous, common silt size quartz grains inclusions,

grading very fine argillaceous sandstone in places.

Sandstone: very light grey to light grey, white-off white, brownish

> grey, rare light bluish grey, occasional smoky quartz aggregates, rare translucent, common dark laminations, common as rock flour, very fine, well sorted, subrounded to rounded, spherical, firm-friable, poor to moderate cemented, non to very slight calcareous cement, dolomitic, argillaceous matrix in places when brownish grey and bluish grey, poor visual porosity, shows: light yellowish brown to bright yellow direct UV, moderate streaming yellowish white to bluish white cut

UV colour (masked by OBM).

Sequence 1: 12217 ft-12468 ft MDRT (9622 ft – 9743 ft)

Massive sandstone alternating locally thin beds of claystone and siltstone.

medium grey to dark brown grey, moderately firm-Claystone:

> friable, sub-blocky, sub-platy in places, non calcareous, moderately silty to very silty grading siltstone, trace

disseminated and nodules pyrite.

Siltstone: light grey, brownish grey, dark yellowish brown, friable,

blocky, firm, crumbly, non to slightly calcareous,

grading to very fine sandstone in places.

Sandstone: light grey, off white-white, medium grey in places,

often as "rock flour", in parts sandstone, colourless to

translucent grains, laminated with dark grev argillaceous streaks in places, very fine to fine, rare medium, sub-angular, sub-spherical, firm-friable, poorly to moderately cemented, slightly to moderately calcareous cement, argillaceous matrix, pyrite, poor visual porosity, shows: patchy dull yellowish brown to moderate yellow direct UV, very slow streaming dull yellowish white cut colour (masked by OBM). Also: brownish grey to dark yellowish brown, light grey to medium light grey in places, off white, very fine grading silt in places, moderately to well sorted, sub-angular to sub-rounded, firm-friable, common argillaceous matrix, slightly to moderately calcareous cement when light, no visual porosity.

Depth					BACKGR	OUND GAS	S			
Interval ft MDRT	Min %	Max %	Avg %	C1 ppm	C2 ppm	C3 ppm	iC4 ppm	nC4 ppm	iC5 ppm	nC5 ppm
Upper int. Jurassic Kimmeridge Clay	ROP: m	ROP: min/max/avg – 23/135/76								
11545- 11949	0.75	1.04	0.93	6243	328	189	21	68	14	22
Sequence 2	ROP: m	in/max/a	avg – 9/4	14/29						
11949- 12009	0.46	1.01	0.82	3530	327	257	25	97	38	28
Middle int. Jurassic Kimmeridge Clay	ROP: min/max/avg – 8/56/29									
12009- 12217	0.41	0.85	0.72	3469	353	236	15	68	14	21
Sequence 1	ROP: m	in/max/a	avg – 7/6	59/39						
12217- 12468	0.49	0.81	0.66	2012	260	207	13	69	21	15
Basal int. Jurassic Kimmeridge Clay	ROP: min/max/avg – 9/33/17									
12468- 12615	0.48	0.65	0.60	2260	201	137	46	16	9	8

Depth	GAS PEAKS									
ft	Bkgnd	Max	C1	C2	C3	iC4	nC4	iC5	nC5	Туре
MDRT	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
11578	0.27	0.75	4288	177	84	8	27	8	8	FG
11768	0.70	1.12	6718	382	230	26	85	24	25	FG
11907	0.60	1.37	9846	592	413	49	162	48	55	FG
Legend:										
FG=Forma	FG=Formation gas, CG=Connection gas, TG=Trip gas, STG=Short trip gas, SW=Swab gas, POG=Pumps off gas									

6. CUTTING DESCRIPTIONS LOG

Well 210/30a-4Y sidetracked at 6080 ft MDRT (-6007 ft TVDSS) from donor well 210/30a-4

			sidetracked at 6080 ft MDRT (-6007 ft TVDSS) from donor well 210/30a-4
DEPT		%	LITHOLOGICAL DESCRIPTION
60		100	CLAYSTONE: medium grey to medium dark grey, slightly firm to firm, sub-blocky to blocky, sub-
(sp	ot)		platy in places, slightly calcareous to calcareous (marly), slightly micromicaceous, trace cement
			contamination.
		Trace	LIMESTONE: mudstone, dolomitic grading dolomitic limestone, greyish orange, light brown,
			friable to firm, crumbly in places, sub-blocky to sub-elongated, micro to crypto-crystalline,
			argillaceous.
60		100	CLAYSTONE: a/a, trace cement contamination.
(B		Trace	LIMESTONE: a/a, dolomitic.
61	20	100	CLAYSTONE: medium grey to medium dark grey, slightly to moderately firm, occasionally soft
			and plastic, sub-blocky to blocky, slightly to moderately calcareous, slightly micromicaceous.
		Trace	LIMESTONE: a/a, dolomitic.
61	40	90	CLAYSTONE: a/a
		10	LIMESTONE: mudstone, greyish orange, pale yellowish orange, rare greyish orange pink and
			light brown, firm, crumbly, sub-blocky to blocky, rare argillaceous, crypto to micro-crystalline,
			occasionally dolomitic.
61	60	100	CLAYSTONE: a/a, slightly silty in places, very fine disseminated pyrite in places.
		Trace	LIMESTONE: a/a.
61	80	70	CLAYSTONE: a/a
		30	LIMESTONE: mudstone, light brown, dark yellowish orange, firm, crumbly, sub-blocky to
			blocky, crypto-crystalline, argillaceous, slightly dolomitic to dolomitic in places.
62	00	100	CLAYSTONE: a/a
		Trace	LIMESTONE: a/a
62	20	80	CLAYSTONE: medium grey, slightly light grey, firm, sub-blocky to blocky, moderately
			calcareous, slightly silty, occasional disseminated pyrite.
		20	LIMESTONE: dolomitic, brownish grey, yellow brown, firm to moderately hard, sub-blocky, to
			blocky, crypto crystalline, mudstone, argillaceous, disseminated pyrite.
62	40	100	CLAYSTONE: a/a
		Trace	Dolomitic LIMESTONE; a/a
62	60	100	CLAYSTONE: a/a predominantly medium grey.
		Trace	Dolomitic LIMESTONE; a/a
62	80	100	CLAYSTONE: a/a
		trace	Dolomitic LIMESTONE; a/a
63	00	100	CLAYSTONE: medium grey, medium dark grey, grey black, soft to firm, sub-blocky, moderately
			calcareous.
		Trace	LIMESTONE: light brown grey, firm, crumbly, else a/a.
63	20	100	CLAYSTONE: a/a. medium dark grey, slightly firmer.
		Trace	LIMESTONE: a/a
63	40	65	CLAYSTONE: medium dark grey a/a
		35	LIMESTONE: white to off white, very light brown, mudstone, firm to hard, brittle, blocky to
			sub-blocky, micro-crystalline, no visible porosity, no show, mineral fluorescence only.
63	60	85	CLAYSTONE: a/a
		15	LIMESTONE: white to off white, with brownish grey,
63	80	75	CLAYSTONE: a/a, generally non calcareous, dark grey to grey black
		25	Dolomitic LIMESTONE: moderate yellowish brown, else a/a.
64	00	65	CLAYSTONE: a/a rare very light grey
		35	Dolomitic LIMESTONE; a/a
64	20	90	CLAYSTONE: light to medium grey, greenish grey, dark olive grey, brown grey, firm to hard,
			blocky to sub-blocky, slightly to moderately calcareous, minor micro-pyrite.
		10	LIMESTONE: a/a slightly dolomitic
64	40	80	CLAYSTONE: becoming lighter green else a/a
		20	LIMESTONE: slightly dolomitic else a/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
6460	60	CLAYSTONE: medium to light grey, occasional very pale green grey, in part purplish brown to
		dusky red, grey brown, firm to moderately hard, blocky to sub-blocky, non swelling,
		moderately calcareous.
	40	LIMESTONE: off white to white, very pale green white, moderate yellow brown, mudstone
		blocky, crypto crystalline, no visible porosity.
6480	70	CLAYSTONE: a/a increase in dusky red,
	30	LIMESTONE: white to off white, very light grey, light green grey, marly, else a/a
6500	90	CLAYSTONE: increasingly medium grey, 5% red brown to dusky red, traces greenish grey,
0000		calcareous.
	10	LIMESTONE: white to off white, very light grey, light green white, marly, else a/a
6520	95	CLAYSTONE: medium grey to dark grey, olive grey, soft to firm, sub-blocky, slightly to
0320	33	moderately calcareous, micromicaceous, slight trace pyrite,
	5	LIMESTONE: a/a
6540	<u> </u>	CLAYSTONE: a/a disseminated pyrite
0340		LIMESRONE: a/a
CECO	15	·
6560	80	CLAYSTONE: medium grey to medium dark grey, dark brown grey, firm to moderately hard, a/a
	20	LIMESTONE: white grey to light yellow brown, firm to hard, blocky, angular, brittle, mudstone
5500		crypto-crystalline, no visible porosity.
6580	90	CLAYSTONE: medium grey to light grey, traces pale green grey, soft to firm, sub-blocky
		moderate to slightly calcareous, non swelling, micro-pyrite,
	10	LIMESTONE: a/a
6600	90	CLAYSTONE: a/a medium to dark grey, micro-pyrite
	10	LIMESTONE: a/a yellow brown predominantly
6620	90	CLAYSTONE: a/a
	20	LIMESTONE: a/a
6640	80	CLAYSTONE: medium grey to grey black, dark grey, soft to moderately hard, sub-blocky to
		blocky, earthy, non to slightly calcareous, micromicaceous, trace disseminated micro-pyrite.
	20	LIMESTONE: light yellow brown, light grey, grey brown, firm to hard, sub-blocky to blocky
		angular, brittle, micro- crystalline, mudstone, dolomitic.
6660	90	CLAYSTONE: medium grey, medium dark grey, occasional light grey, marly else a/a
	10	LIMESTONE: yellow brown, light grey, firm to hard, blocky, crumbly, else a/a.
6680	80	CLAYSTONE: medium grey, a/a.
	15	LIMESTONE: a/a
6700	90	CLAYSTONE: light to medium grey, with medium to dark grey, non calcareous.
	10	DOLOMITE/LIMESTONE: light yellow brown, medium brown, in part very hard, angular.
6720	50	CLAYSTONE: a/a
0, 20	50	LIMESTONE: a/a
6740	80	CLAYSTONE: a/a
0740	20	LIMESTONE: a/a
6760	20	missed
6780	80	CLAYSTONE: medium to dark grey, soft, in part moderately hard, blocky, non swelling, mino
0780	80	disseminated pyrite, non calcareous.
	20	
	20	DOLOMITE/LIMESTONE: light yellow brown, firm to moderately hard, blocky, crumbly
5000		mudstone, micro-crystalline
6800	75	CLAYSTONE: a/a slight greenish grey in parts.
	25	LIMESTONE: a/a
6820	65	CLAYSTONE: a/a
	35	LIMESTONE: light yellow brown, in part light grey, firm to moderately hard, blocky, crumbly
		rare green specks (glauconite)
6840	70	CLAYSTONE: a/a
	30	LIMESTONE: a/a
	80	CLAYSTONE: a/a
6860	80	
6860	20	LIMESTONE: a/a
6860 6880		

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
6900	95	CLAYSTONE: a/a
	5	LIMESTONE/DOLOMITE: a/a
6920	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
6940	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
6960		missed
6980		missed
7000	95	CLAYSTONE: medium dark grey, firm to very firm, sub-blocky, sub-platy in places, slightly to
		moderately calcareous, slightly micromicaceous, occasionally very fine disseminated pyrite.
	5	DOLOMITE: greyish orange, light brown, firm to moderately hard, crumbly in places, common
7000		blocky, crypto to micro-crystalline, argillaceous, common argillaceous streaks.
7020	100	missed
7040	100	CLAYSTONE: a/a
7000	Trace	LIMESTONE/DOLOMITE: a/a
7060	100	missed
7080	100	CLAYSTONE: a/a, non calcareous in places.
7100	Trace 75	LIMESTONE/DOLOMITE: a/a CLAYSTONE: a/a
7100	25	DOLOMITE: greyish orange, dark yellowish orange, light brown, firm to moderately hard,
	23	crumbly, blocky, crypto to micro-crystalline, argillaceous, common dark grey argillaceous
		streaks.
7120		missed
7140	90	CLAYSTONE: a/a
72.0	10	DOLOMITE: a/a
7160	90	CLAYSTONE: medium grey to medium dark grey, firm, sub-blocky to blocky, sub-platy in places,
		non to moderately calcareous, rare slightly to moderately calcareous, slightly micromicaceous.
	5	SANDSTONE: very light grey to medium grey, translucent in places, very fine, well sorted, sub-
		angular to sub-rounded, spherical, firm, friable, poorly to moderately cemented, slightly
		calcareous cement / argillaceous matrix, poor visual porosity.
	5	DOLOMITE: a/a
7180	95	CLAYSTONE: a/a, slightly silty in places, occasionally fine disseminated pyrite.
	5	DOLOMITE: a/a
	Trace	SANDSTONE: a/a
7200		missed
7220	95	CLAYSTONE: a/a
72.40	5	DOLOMITE: a/a, missed
7240	400	missed
7260	100	CLAYSTONE: medium grey to medium dark grey, rarely greenish grey, firm to very firm, sub- blocky to blocky, predominantly non to very slightly calcareous, slightly micromicaceous.
	Trace	DOLOMITE: a/a
	Trace	SANDSTONE: light brown, very fine grading silt, well sorted, firm, moderately cemented with
	Trucc	dolomitic cement, no visual porosity.
7280	80	CLAYSTONE: a/a
	20	DOLOMITE: dusky yellow, dark yellowish orange, light brown, occasionally moderate brown,
		firm to hard in places, friable in places, crumbly, blocky, crypto to micro-crystalline,
		argillaceous with argillaceous streaks, silty in places.
7300		missed
7320	100	CLAYSTONE: a/a
	Trace	DOLOMITE: a/a
7340		missed
7360	100	CLAYSTONE: a/a
	Trace	DOLOMITE: a/a
7380	90	CLAYSTONE: a/a, slightly to moderately calcareous, slightly silty in places.

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
, ,	10	DOLOMITE: a/a
7400		missed
7420	100	CLAYSTONE: medium dark grey, firm to very firm, sub-blocky to blocky, slightly to moderately
		calcareous, slightly micromicaceous.
	Trace	DOLOMITE: a/a
7440		missed
7460		missed
7480	100	CLAYSTONE: a/a
	Trace	DOLOMITE: a/a
7500		missed
7520		missed
7540	100	CLAYSTONE: a/a
	Trace	DOLOMITE: a/a
	Trace	LIMESTONE: mudstone, dark yellowish orange, light brown, firm to moderately hard, blocky,
		crypto to micro-crystalline, argillaceous, slightly silty in places, argillaceous streaks in places,
		dolomitic grading dolomitic limestone.
7560		missed
7580	100	CLAYSTONE: a/a
	Trace	DOLOMITE: a/a
	Trace	LIMESTONE: a/a
7600		missed
7620	100	CLAYSTONE: medium dark grey, firm to very firm, sub-blocky to blocky, sub-platy in places, non
		to moderately calcareous, slightly silty in places, rarely silty, micromicaceous.
	Trace	LIMESTONE/DOLOMITE: a/a
7640	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
7660	100	CLAYSTONE: a/a
7500	Trace	LIMESTONE/DOLOMITE: a/a
7680	95	CLAYSTONE: a/a
	5	DOLOMITE: dark yellowish orange, dusky yellow, light brown, firm to moderately hard,
		crumbly in places, blocky, crypto to micro-crystalline, argillaceous with common argillaceous streaks, slightly silty in places.
7700		missed
7720		missed
7740	100	CLAYSTONE: medium dark grey to brownish grey, olive grey, firm to very firm, blocky to sub-
7740	100	blocky, sub-platy in places, non to slightly calcareous, slightly silty in places, slightly
		micromicaceous.
	Trace	DOLOMITE: a/a
7760	10	CLAYSTONE: a/a
7700	Trace	LIMESTONE/DOLOMITE: a/a
7780		missed
7000	0.5	CLAVCTONE: a /a
7800	95	CLAYSTONE: a/a
7820	5	LIMESTONE/DOLOMITE: a/a
	0.5	missed
7840	95 5	CLAYSTONE: a/a LIMESTONE/DOLOMITE: a/a, in part light brown.
7860	3	missed
7880		missed
7900	90	CLAYSTONE: a/a
7,500	10	LIMESTONE: a/a
7920	100	CLAYSTONE: medium dark grey, olive grey, firm to moderately hard, blocky, waxy, slightly
7320	100	calcareous, micromicaceous.
	Trace	DOLOMITE/LIMESTONE: a/a
7940	100	CLAYSTONE: a/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
7960		missed
7980	100	CLAYSTONE: a/a
8000	100	CLAYSTONE: medium grey, grey black, occasional light grey, firm, in part soft, blocky to sub-
		blocky, moderately to slightly calcareous, silty in part, rare included sandstone—light grey,
		very fine, friable, glauconitic.
8020	95	CLAYSTONE: a/a
	5	LIMESTONE/DOLOMITE: yellowish brown, dusky yellow, light brown, firm to moderately hard,
		crumbly in places, blocky, crypto to micro-crystalline, argillaceous, slightly silty texture.
8040	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
8060	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
8080	100	CLAYSTONE: a/a becoming somewhat lighter in colour
	Trace	LIMESTONE/DOLOMITE: a/a
8100	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
8120		missed
8140	100	CLAYSTONE: dark grey, grey black, occasional medium grey, firm to moderately hard, soft in
		parts, sub blocky, slightly to moderately calcareous.
8160	100	CLAYSTONE: a/a
8180	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
8200	100	CLAYSTONE: medium to dark grey, occasional light grey, firm to moderately hard, in part soft,
		sub blocky, slightly to moderately calcareous.
8220	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
8240	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
8260	100	CLAYSTONE: medium dark grey, medium grey, firm to moderately hard, blocky, slightly to
		moderately calcareous
	Trace	DOLOMITE: medium brown, hard, angular break, brittle, micro-crystalline.
8280	100	CLAYSTONE: a/a in part light green grey
	Trace	LIMESTONE/DOLOMITE: a/a
8300	100	CLAYSTONE: a/a
	Trace	LIMESTONE/DOLOMITE: a/a
8320		missed
8340	100	CLAYSTONE: predominantly medium dark grey, greyish black, blocky, firm to moderately hard,
	_	slightly silty, moderately calcareous.
0250	Trace	LIMESTONE/DOLOMITE: a/a
8360	100	CLAYSTONE: predominantly medium dark grey, greyish black, blocky, firm to moderately hard,
	Tueses	slightly silty, moderately calcareous.
0200	Trace	LIMESTONE/DOLOMITE: a/a
8380	100	missed
8400	100	CLAYSTONE: predominantly medium dark grey, greyish black, blocky, firm to moderately hard,
	Traca	slightly silty, moderately calcareous.
0420	Trace	LIMESTONE/DOLOMITE: a/a
8420	100 Trace	CLAYSTONE: a/a LIMESTONE/DOLOMITE: a/a
8440	Trace 80	LIMESTONE: DOLOMITE: a/a LIMESTONE: off white, blocky, brittle, angular, mudstone, chalky, micro to crypto-crystalline,
0440	00	no visible porosity. General dull yellow even fluorescence, spots moderately bright yellow,
		slow streaming blue white cut, masked by OBM.
	20	CLAYSTONE: medium dark grey, medium grey, firm to moderately hard, blocky, slightly to
	20	moderately calcareous
8460	60	LIMESTONE: a/a
0+00	00	Envications: u/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
(-/	40	CLAYSTONE: a/a.
8480	90	LIMESTONE: a/a
	10	CLAYSTONE: medium dark grey, medium grey, firm to moderately hard, blocky, slightly to
		moderately calcareous
8500	100	CLAYSTONE: medium grey to medium dark grey, occasional pale green grey, blocky,
		moderately hard to hard, non swelling, moderately calcareous, pyritic, sandy.
8520	97	CLAYSTONE: a/a
	3	SANDSTONE: very light grey, white, pale green, colourless to white grains, very fine to silt,
		friable, glauconite specks.
8540	97	CLAYSTONE: medium grey to medium dark grey, occasional pale green grey, blocky,
		moderately hard to hard, non swelling, moderately calcareous, pyritic, sandy.
	3	SANDSTONE: very light grey, white, pale green, colourless to white grains, very fine to silt,
		friable, glauconite specks.
8560	95	CLAYSTONE: a/a
	5	SANDSTONE: a/a
8580	100	CLAYSTONE: medium dark grey, occasional pale green grey, blocky, moderately hard to hard,
		non swelling, silty to very silty, moderately calcareous, pyritic, sandy grades in part to very fine
0500	100	sandstone
8600	100	CLAYSTONE: medium dark grey, occasional pale green grey, blocky, moderately hard to hard,
		non swelling, silty to very silty, moderately calcareous, pyritic, sandy grades in part to very fine
8620	100	sandstone CLAYSTONE: medium dark grey, occasional pale green grey, blocky, moderately hard to hard,
8620	100	non swelling, silty to very silty, moderately calcareous, pyritic, sandy grades in part to very fine
		sandstone.
	Trace	SANDSTONE: very light grey, white, pale green, colourless to white grains, very fine to silt,
	Hacc	friable, glauconite specks.
8640	100	CLAYSTONE: medium grey to medium dark grey, moderately firm to firm, sub-blocky to blocky,
		very slightly calcareous to calcareous, moderately silty to silty in places, slightly
		micromicaceous.
8660	100	CLAYSTONE: a/a, occasionally soft, plastic and sticky.
	Trace	DOLOMITE: a/a
8680		missed
8700	100	CLAYSTONE: medium grey, olive grey, moderately firm to firm, occasionally soft, plastic and
		sticky, sub-blocky to blocky, sub-platy in places, slightly to moderately calcareous, slightly
		micromicaceous.
	Trace	DOLOMITE: a/a
8720	100	CLAYSTONE: a/a, medium grey, less soft
	Trace	LIMESTONE: mudstone, greyish orange, light brown, occasionally vitreous, firm to moderately
		hard, blocky, crypto to micro-crystalline, argillaceous in places, dolomitic in places grading
9740		dolomitic limestone.
8740	100	missed
8760	100	CLAYSTONE: medium grey to medium dark grey, firm to very firm, sub-blocky to blocky, sub-
	Traco	platy in places, common moderately calcareous, slightly micromicaceous. LIMESTONE: a/a, also very pale orange
8780	Trace 95	CLAYSTONE: a/a, also very pale orange CLAYSTONE: a/a, olive grey in places
8780	5	LIMESTONE: a/a, occasionally argillaceous laminations.
8800	100	CLAYSTONE: a/a, slightly to moderately silty in places
	Trace	LIMESTONE: a/a, occasionally white-off white.
8820	100	CLAYSTONE: a/a, occasionally medium light grey, soft, non calcareous.
	Trace	LIMESTONE: a/a, occasionally argillaceous laminations.
8840		missed
8860	100	CLAYSTONE: medium grey to medium dark grey, light grey to medium light grey in places,
		predominantly firm to very firm, soft, plastic and sticky when light, sub-blocky to blocky,
		slightly to moderately calcareous, slightly micromicaceous.
	Trace	LIMESTONE: a/a.

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
8880	95	CLAYSTONE: a/a.
	5	LIMESTONE: mudstone, dusky yellow to dark yellowish orange, light brown, firm, friable in
		places, blocky, micro to crypto-crystalline, argillaceous, dolomitic in places grading dolomitic
		limestone, rarely argillaceous laminations.
8900	90	CLAYSTONE: a/a.
	10	LIMESTONE: a/a.
8920		missed
8940	95	CLAYSTONE: a/a.
	5	LIMESTONE: a/a.
8960		missed
8980	100	CLAYSTONE: a/a, olive grey in places
	Trace	SANDSTONE: very light grey to light grey, translucent, very fine, well sorted, moderately hard,
	Traca	well cemented, calcareous cement, tight.
0000	Trace	LIMESTONE: a/a, occasionally argillaceous laminations.
9000	100	CLAYSTONE: medium grey to medium dark grey, olive grey, occasionally medium light grey, firm to very firm, sub-blocky to blocky, sub-platy in places, moderately calcareous, slightly
		micromicaceous.
	Trace	LIMESTONE: a/a, predominantly yellowish grey.
9020	100	CLAYSTONE: a/a, predominantly yellowish grey.
9020	Trace	LIMESTONE: a/a
9040	Trace	missed
9060		missed
9080	95	CLAYSTONE: medium grey to medium dark grey, olive grey, rarely medium light grey, firm, sub-
3080	95	blocky to blocky, non to moderately calcareous, slightly micromicaceous.
	5	LIMESTONE: mudstone, dusky yellow, dark yellowish orange, light brown, occasionally white,
		firm, blocky, crypto-crystalline, argillaceous, grading dolomitic limestone.
9100		missed
9120		missed
9140		missed
9160	100	CLAYSTONE: a/a, slightly to moderately calcareous.
3200	Trace	LIMESTONE: a/a.
9180	100	CLAYSTONE: medium grey to medium dark grey, olive grey, medium light grey in places,
		slightly firm to firm, occasionally soft, sub-blocky to blocky, non to moderately calcareous,
		calcareous in places (marly), rarely slightly to moderately silty, slightly micromicaceous.
	Trace	LIMESTONE: a/a.
9200	100	CLAYSTONE: a/a, predominantly medium dark grey to medium grey, olive grey.
	Trace	LIMESTONE: a/a.
9220		missed
9240	100	CLAYSTONE: a/a
	Trace	LIMESTONE: a/a.
9260		missed
9280	100	CLAYSTONE: a/a
	Trace	LIMESTONE: a/a.
9300	100	CLAYSTONE: medium dark grey to medium grey, medium light grey in places, olive grey,
		predominantly firm, soft in places, sub-blocky to blocky, non to moderately calcareous, slightly
	1_	to moderately silty in places, slightly micromicaceous.
0000	Trace	LIMESTONE: a/a.
9320	100	CLAYSTONE: a/a
03.40	Trace	LIMESTONE: a/a.
9340	100	CLAYSTONE: a/a
	Trace	LIMESTONE: mudstone, dusky yellow, occasionally very light grey and off white, firm, blocky,
0260	 	crypto to micro-crystalline, argillaceous, grading dolomitic limestone.
9360	100	missed
9380	100	CLAYSTONE: a/a

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
, ,	trace	LIMESTONE: a/a.
9400		missed
9420	100	CLAYSTONE: medium dark grey to medium grey, medium light grey in places, olive grey,
		predominantly firm, soft in places, sub-blocky to blocky, non to moderately calcareous, slightly
		to moderately silty in places, slightly micromicaceous.
9440	90	CLAYSTONE: a/a
	10	LIMESTONE: dolomitic, light grey, pale yellow brown, occasional medium brown, in part white,
		firm to moderately hard, blocky to sub-blocky, micro-crystalline, angular break, argillaceous
		laminations, no visible porosity, no shows.
9460		missed
9480	90	CLAYSTONE: a/a
	10	LIMESTONE: a/a.
9500		missed
9520	100	CLAYSTONE: a/a medium grey to medium dark grey, occasional green to green grey.
	Trace	LIMESTONE: a/a.
9540		missed
9560	100	CLAYSTONE: dark grey, increasing greenish grey, light green, olive grey to grey black, firm to
		occasionally very soft, sub-blocky to blocky, occasional plastic, waxy, silty, non swelling,
		calcareous, micromicaceous.
	Trace	LIMESTONE: off white, very light brown, moderately hard, sub angular, brittle, splintery,
		microcrystalline,
9580	100	CLAYSTONE: a/a generally medium green
	Trace	LIMESTONE: a/a.
9600	100	CLAYSTONE: a/a soft, plastic, light grey to white grey
	Trace	LIMESTONE: a/a.
9620	100	CLAYSTONE: a/a medium grey, with light grey, light green, firm to soft, sub blocky, calcareous.
	Trace	LIMESTONE: a/a. light yellow brown, dolomitic.
9640	100	CLAYSTONE: a/a
	Trace	LIMESTONE: a/a.
9660	100	CLAYSTONE: a/a
	Trace	LIMESTONE: a/a.
9680	100	CLAYSTONE: a/a pyrite, occasional white calcareous lamina.
9700		missed
9720	100	CLAYSTONE: a/a
	Trace	LIMESTONE: a/a.
9740	100	CLAYSTONE: a/a
	Trace	SANDSTONE: very light brown, crumbly translucent, very fine, well sorted, moderately hard,
0760	0.2	well cemented, calcareous cement, tight.
9760	92	CLAYSTONE: a/a
0700	8	LIMESTONE: a/a.
9780	95	CLAYSTONE: medium to light grey, white grey, light green to green grey, very soft in parts to
		firm, amorphous to sub-blocky, waxy, plastic, moderately calcareous, micro micaceous,
	_	glauconite.
	5	LIMESTONE: light grey, light yellow brown, blocky, crumbly, argillaceous, micro crystalline,
0000	100	silty, occasionally sandy, no to poor visible porosity, no shows.
9800	100	CLAYSTONE: light brownish grey to medium brown grey, light grey, light green grey, soft to firm, amorphous to sub-blocky, waxy, plastic in part, moderately calcareous, micromicaceous,
		silty to very silty.
	Trace	LIMESTONE: light grey, light yellow brown, blocky, crumbly, argillaceous, micro crystalline,
	Trace	silty, occasionally sandy, no to poor visible porosity, no shows.
	Trace	SANDSTONE: traces; light brown, light grey, crumbly, off white matrix fill, calcareous,
	Trace	colourless to cloudy white grains, very fine, sub-rounded, glauconitic.
9820	95	CLAYSTONE: a/a
3020	5	LIMESTONE: a/a
		1

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION
	Trace	SANDSTONE: a/a
9840		missed
9860	100	CLAYSTONE: a/a. medium grey to light grey
	Trace	LIMESTONE: a/a occasional white
	Trace	SANDSTONE: a/a. very slight trace
9880	100	CLAYSTONE: a/a.
	Trace	LIMESTONE: a/a
9900	100	CLAYSTONE: a/a. in part very light grey, soft, calcareous
	Trace	LIMESTONE: a/a, in part very hard.
9920	100	CLAYSTONE: light brownish grey to medium brown grey, medium grey to light grey, white grey, soft to firm, amorphous to sub-blocky, waxy, plastic in part, non swelling, moderately
		calcareous to very calcareous, micromicaceous, micro pyrite, silty to very silty.
9940	100	CLAYSTONE: a/a.
9960	100	CLAYSTONE: light brownish grey to medium brown grey, medium grey to light grey, white grey, soft to firm, amorphous to sub-blocky, waxy, plastic in part, non swelling, moderately
0000	100	calcareous to very calcareous, micromicaceous, micro pyrite, silty to very silty.
9980	100	CLAYSTONE: a/a.
10000	97	CLAYSTONE; medium to light grey, in part white grey, firm to soft, plastic in parts, sub-blocky to blocky, waxy, slightly silty in places, very calcareous, grades to marl, micro-pyrite. LIMESTONE: off white, orange brown, light grey, firm, blocky, splintery, micro-crypto-
	3	crystalline, angular, brittle, mudstone, locally argillaceous, glauconite, no visible porosity. No
		Shows. Fibrous calcite.
10020	90	CLAYSTONE: a/a.
10020	10	LIMESTONE: a/a
10040	85	CLAYSTONE: a/a. increasingly lighter colour, marly, very calcareous.
10040	15	LIMESTONE: a/a
10060	85	CLAYSTONE: a/a.
10000	15	LIMESTONE: a/a
10080	85	CLAYSTONE: a/a increasingly white grey, light grey, very soft, marly, glauconite.
	15	LIMESTONE: a/a with white to off white, very light brown, light grey, firm to very hard, blocky,
		brittle, angular break, micro-crystalline, slightly argillaceous, glauconite, no visible porosity, no
		shows, fibrous calcite
	Trace	SANDSTONE: white, very fine, sub-angular grains, glauconite, friable.
10100	85	CLAYSTONE: a/a.
	15	LIMESTONE: a/a
10120		missed
10140	60	CLAYSTONE: medium to light grey, increasingly white grey, firm to soft, plastic in parts, sub-
		blocky to blocky, waxy, slightly silty in places, very calcareous, grades to marl, micro-pyrite.
		LIMESTONE: white to off white, very light brown, light grey, firm to very hard, blocky, brittle,
	40	angular break, micro-crystalline, slightly argillaceous, glauconite, no visible porosity, no shows,
		fibrous calcite.
	Trace	SANDSTONE: traces: very light grey, white, crumbly, very fine, very glauconite, calcite cement.
10160	90	CLAYSTONE: a/a.
	10	LIMESTONE: a/a
10100	Trace	SANDSTONE: a/a
10180	100	CLAYSTONE: a/a medium grey to medium dark grey
10200	95	CLAYSTONE: medium dark grey, medium dark brown grey, with light grey, green grey, pale
		green, white grey, generally moderately firm to moderately hard, blocky, in part soft, plastic,
	_	non swelling, calcareous, glauconitic.
40330	5	LIMESTONE: light brown, light grey, off white a/a
10220	100	CLAYSTONE: medium dark grey, medium dark brown grey, with light grey, green grey, pale green, white grey and with medium red brown, often mottled red and grey, soft to firm
		occasionally hard, in part very soft, plastic, blocky, in part platy, sub fissile, non swelling,
		calcareous, red brown non calcareous, glauconite.
	1	calculations, rea prown non calculations, gradientic.

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION			
10240	100	CLAYSTONE: a/a grey with red brown a/a often mottled, sub-fissile, earthy			
	Trace	LIMESTONE: light grey, light brown, off white, else a/a			
10260		missed			
10280	100 Trace	CLAYSTONE: medium grey to medium dark grey, medium light grey in places, firm, soft in places, sub-blocky to blocky, moderately calcareous to calcareous grading marl, slightly micromicaceous. LIMESTONE: mudstone, greyish orange, very pale orange, firm, friable, blocky, crypto-			
10300	100	crystalline, argillaceous, slightly silty in places. CLAYSTONE: a/a, rarely reddish brown, non to very slightly calcareous.			
10300	Trace	LIMESTONE: a/a			
10320	90	CLAYSTONE: a/a.			
10520	10	LIMESTONE: mudstone, greyish orange, very pale orange, dark yellowish orange, firm to moderately hard, crumbly, brittle in places, blocky, crypto to micro-crystalline, argillaceous in places.			
10340	100	CLAYSTONE: a/a			
	Trace	LIMESTONE: a/a			
10360		missed			
10380		missed			
10400	100	CLAYSTONE: varicoloured, medium grey to medium dark grey, olive grey, medium light grey to medium light greenish grey, reddish brown, blocky, firm, rarely soft, non to moderately calcareous, slightly silty in places, slightly micromicaceous.			
10420	Trace	LIMESTONE: a/a			
10420	100	missed			
10440	100 Trace	CLAYSTONE: medium grey to medium light grey, greenish grey, rarely reddish brown, soft to firm, plastic and sticky in places, sub-blocky to blocky, non calcareous, occasionally moderately silty, slightly micromicaceous. LIMESTONE: a/a			
10460		missed			
10480	100 Trace	CLAYSTONE: a/a, becoming medium dark grey to medium grey, reddish brown in place common non calcareous, rarely slightly to moderately calcareous, occasionally moderate silty. LIMESTONE: mudstone-wackestone, greyish orange, dark yellowish orange, firm, friabl blocky, crypto to micro-crystalline, argillaceous, silty in places, locally argillaceous streaks.			
10500		missed			
10520	100 Trace Trace	CLAYSTONE: a/a, rarely reddish brown, non to very slightly calcareous. SANDSTONE: very light brown, greyish orange, very fine to silty, well sorted, firm, frial moderately cemented with moderately calcareous cement, non to poor visual porosity. LIMESTONE: a/a			
10540	100 Trace	CLAYSTONE: a/a, also light brown, increasing percentage of reddish brown, non calcareous. LIMESTONE: a/a			
10560	100	CLAYSTONE: a/a, less reddish brown			
	Trace	LIMESTONE: a/a			
10580	100	CLAYSTONE: a/a, predominantly non calcareous.			
	Trace	LIMESTONE: a/a			
10600		missed			
10620	100 Trace	CLAYSTONE: varicoloured, medium dark grey to medium grey, olive grey, greenish grey moderate brown to reddish brown, firm, sub-blocky to blocky, sub-platy in places, non t moderately calcareous, rarely slightly silty, slightly micromicaceous. LIMESTONE: a/a			
10640		missed			
10660	100 Trace Trace	missed CLAYSTONE: a/a, predominantly medium dark grey to medium grey, olive grey, reddish brow in places. SANDSTONE: a/a LIMESTONE: a/a			

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION		
10680		missed		
10700	80	CLAYSTONE: a/a, becoming moderately calcareous, calcareous (marly) in places.		
	10	SANDSTONE: very light grey, off white, light greenish grey to greenish grey, common dark		
		spotted, translucent in places, very fine, well sorted, sub-angular to sub-rounded, common		
		spherical, firm, friable, moderately hard in places, poorly to well cemented, moderately		
		calcareous cement, micromica in places, poor visual porosity, no shows.		
	10	LIMESTONE: a/a		
10720	60	CLAYSTONE: varicoloured, medium grey to dark grey, greyish black in places, medium dark		
		greenish grey to dark greenish grey, greenish grey, reddish brown, firm to very firm, sub-		
		blocky to blocky, sub-platy in places, non to moderately calcareous, slightly to moderately silty		
	5	in places, slightly micromicaceous, carbonaceous when dark grey and greyish black. SANDSTONE: a/a.		
	35	LIMESTONE: mudstone-wackestone, varicoloured, greyish orange to dark yellowish orange,		
	33	dusky yellow, light brown, pale yellowish brown in places, firm to moderately hard, friable in		
		places, crumbly, crypto to micro-crystalline, argillaceous with common argillaceous /		
		carbonaceous streaks and laminations, silty/sandy in places.		
10740		missed		
10760	50	CLAYSTONE: a/a.		
	Trace	SANDSTONE: a/a		
	50	LIMESTONE: a/a		
10780		missed		
10800	70	CLAYSTONE: a/a.		
	Trace	SILTSTONE: light to moderate brown, common dark spotted, firm, friable, blocky, moderately		
		calcareous, argillaceous.		
	Trace	SANDSTONE: a/a		
	30	LIMESTONE: a/a		
10820		missed		
10840	65	CLAYSTONE: a/a.		
	Trace	SILTSTONE: a/a		
	Trace	SANDSTONE: a/a		
10000	35	LIMESTONE: a/a		
10860	80	CLAYSTONE: medium grey to medium greenish grey, medium dark grey, rarely dark grey and reddish brown, firm, sub-blocky to blocky, sub-platy in places, moderately calcareous to		
		calcareous (marly), slightly to moderately silty in places, slightly micromicaceous.		
	Trace	SILTSTONE: a/a		
	20	LIMESTONE: a/a		
10880		missed		
10900	85	CLAYSTONE: a/a, moderate calcareous to calcareous, grading marl in places, slightly to		
		moderately silty in places.		
	15	LIMESTONE: mudstone, dark yellowish orange, greyish orange, yellowish brown, firm to		
		moderately hard, hard in places, crumbly, brittle, blocky, crypto to micro-crystalline,		
		argillaceous, common argillaceous / carbonaceous laminations and streaks, rarely silty.		
10920		missed		
10940	90	CLAYSTONE: a/a.		
	10 LIMESTONE: a/a			
10960		missed		
10980	95	CLAYSTONE: medium dark grey to brownish grey, firm to very firm, sub-blocky to blocky, sub-		
		platy in places, moderately calcareous to calcareous grading marl, locally slightly silty, slightly		
		micromicaceous.		
11000	5 95	LIMESTONE: a/a CLAYSTONE: a/a.		
11000	5	LIMESTONE: a/a.		
11020	<u> </u>	missed		
11040		missed		
11060		missed		
11000	I.	1		

DEPTH (ft) % LITHOLOGICAL DESCRIPTION				
		CLAYSTONE: medium dark grey to brownish grey, olive grey, firm to moderately firm, blocky to		
		sub-blocky, sub-platy in places, moderately calcareous to calcareous grading marl, slightly to		
		moderately silty, silty in places grading silty claystone, slightly micromicaceous		
	5	LIMESTONE: a/a		
11100	100	CLAYSTONE: a/a.		
	Trace	LIMESTONE: mudstone, dark yellowish orange, greyish orange, light brown, firm to hard,		
		crumbly, brittle, blocky, crypto to micro-crystalline, argillaceous in places, dolomitic in places		
		grading dolomitic limestone		
11120	100	CLAYSTONE: medium grey to medium greenish grey, greyish green in places, slightly firm to		
		firm, blocky to sub-blocky, moderately calcareous to calcareous grading marl, slightly to		
		moderately silty in places		
	Trace	SILTSTONE: medium grey to medium greenish grey, friable, blocky, moderately calcareous to		
		calcareous, argillaceous.		
	Trace	LIMESTONE: a/a		
11140	90	CLAYSTONE: a/a.		
	10	LIMESTONE: a/a		
11160		missed		
11180	85	CLAYSTONE: a/a.		
	15	LIMESTONE: a/a		
11200	100	CLAYSTONE: predominantly reddish brown, medium dark grey to brownish grey in places, dark		
		greenish grey in places, firm, sub-blocky to blocky, moderately calcareous to calcareous		
		grading marl, slightly to moderately silty in places, slightly micromicaceous.		
	Trace	LIMESTONE: a/a		
11220	100	CLAYSTONE: a/a, less reddish brown		
	Trace	LIMESTONE: a/a		
		CLAYSTONE: medium grey, with light grey, white grey and green grey, together with medium		
		red brown, firm to moderately hard, sub-blocky to blocky, moderate to very calcareous, red		
		brown slightly calcareous, mottled and laminated.		
	Trace	LIMESTONE: yellow brown to medium brown, firm to hard, blocky, micro-crystalline,		
		argillaceous, no visible porosity.		
11260	100	CLAYSTONE: increase in light grey, marly, traces very dark grey to black		
	Trace	LIMESTONE: becoming off white to white, argillaceous, laminated		
11280	90	CLAYSTONE: a/a, 15% reddish brown, often mottled		
	10	LIMESTONE: a/a		
11300				
	10	LIMESTONE: a/a		
11320	95	CLAYSTONE: a/a, marly in parts		
	5	LIMESTONE: a/a		
11340	95	CLAYSTONE: a/a, increase in reddish brown to dark red brown, pyrite nodules.		
	5	LIMESTONE: a/a		
11360	95	CLAYSTONE: a/a, less reddish brown		
	5	LIMESTONE: a/a		
11380	100	CLAYSTONE: a/a, becoming darker grey, green grey, some red brown, very calcareous, marly,		
		slightly carbonaceous.		
11400 100 CLAYSTONE: varicoloured, predominantly red brown to moderate brown, with				
		dark grey, rarely black, increasingly very light grey to white grey, very pale green, very soft to		
		occasionally firm, rarely very firm, sub-blocky, sticky in places, commonly plastic to crumbly,		
		grey very calcareous, marly, often mottled, pyrite nodules.		
11420	92	CLAYSTONE: a/a.		
	8	LIMESTONE: very light grey to light grey, off white, firm, very light brown, sub-blocky to blocky,		
		micro-crystalline, mudstone, argillaceous, commonly micro-pyritic.		
11440	100	CLAYSTONE: a/a. increase in light grey, soft, marly, pyrite nodules, red brown also soft but non		
		calcareous.		
11460	100			
11480	90	CLAYSTONE: varicoloured, predominantly red brown to moderate brown, with medium to		

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION	
		dark grey, rarely black, increasingly very light grey to white grey, very pale green, very soft to	
		occasionally firm, rarely very firm, sub-blocky, sticky in places, commonly plastic to crumbly,	
		grey very calcareous, marly, often mottled, pyrite nodules.	
	10	LIMESTONE: very light grey to light grey, off white, firm, very light brown, sub-blocky to blocky,	
		micro-crystalline, mudstone, argillaceous, commonly micro-pyritic.	
11500	90	CLAYSTONE: abundant red brown, with very light grey, to dark grey, rare green to green grey.	
	10	LIMESTONE: light grey, grey, off white, firm, brittle, hard to soft, slightly argillaceous	
		mudstone, no visible porosity, no show.	
11520	90	CLAYSTONE: light grey to grey, greenish, very soft, grades to marly, occasional incoming dark	
		grey, moderately hard	
	10	LIMESTONE: a/a	
11540	40	LIMESTONE: off white, very light grey, in part speckled green (glauconite) occasional quartz	
		grains included, firm to moderately hard, argillaceous, mudstone, brittle, micro crystalline, no	
		visible porosity, no show.	
	60	CLAYSTONE: a/a increase in very dark green, banded, also light green, soapy, very pyritic, soft,	
		blocky.	
11560	60	CLAYSTONE: a/a some very dark green, banded, also light green, soapy, very pyritic, soft,	
		blocky, non calcareous, speckled white/dark green, tuff??, Incoming very dark grey, grey black	
		Kimmeridge.	
	40	LIMESTONE: off white, very light grey, in part speckled green (glauconite) occasional quartz	
		grains included, firm to moderately hard, argillaceous, mudstone, brittle, very pyritic, micro	
		crystalline, no visible porosity, no show.	
	Trace	SANDSTONE: very hard, glassy, well cemented no visible porosity.	
11580	90	CLAYSTONE: brownish black to olive black, dark grey brown, dusky yellow brown, firm to hard,	
		sub-blocky to blocky, crumbly, earthy, moderately silty in places, non calcareous, occasionally	
		micromicaceous, pyrite nodules, disseminated micro-pyrite, occasional carbonaceous flakes,	
		with occasional coloured a/a	
	10	LIMESTONE: very light grey, off white, speckled green, moderately hard, blocky, argillaceous in	
		part grading to marl, sandy, colourless quartz grains, very fine, well cemented, hard,	
		glauconitic, pyritic.	
	Trace	SANDSTONE: colourless to translucent grains, very fine, pyrite, friable	
11600		missed	
11620	100	CLAYSTONE: dark grey brown, dusky yellow brown, firm to hard, blocky, non calcareous. a/a	
11640	100	CLAYSTONE: a/a slight trace carbonaceous flakes, disseminated pyrite and nodules	
11660	100	CLAYSTONE: brownish black to olive black, dark grey brown, dusky yellow brown, firm to hard,	
		sub-blocky to blocky, earthy, moderately silty in places, non calcareous, occasionally	
		micromicaceous, disseminated micro-pyrite, coaly fragments.	
	Trace	SANDSTONE: as laminations, light grey, very argillaceous, friable.	
11680	100	CLAYSTONE: brownish black to olive black, dark grey brown, dusky yellow brown, firm to hard,	
		sub-blocky to blocky, earthy, moderately silty in places, non calcareous, occasionally	
		micromicaceous, disseminated micro-pyrite, coaly fragments.	
11700	100	CLAYSTONE: a/a	
	Trace	SANDSTONE: as laminations in the Claystone; white to light grey, hard to crumbly, colourless	
		to white grains, very fine to silt, sub rounded, in part dolomitic cement, white matrix fill, dull	
		yellow fluorescence, no cut above OBM effect.	
11720	100	CLAYSTONE: a/a	
	Trace	SANDSTONE: a/a	
11740	100	CLAYSTONE: brownish black to olive black, dark grey brown, dusky yellow brown, firm to hard,	
		sub-blocky to blocky, earthy, moderately silty in places, non calcareous, occasionally	
		micromicaceous, disseminated micro-pyrite, coaly fragments.	
11760	95	CLAYSTONE: a/a. dusky yellow brown, dark brown grey, very pyritic.	
	5	SANDSTONE: partly as "rock flour", off white to light grey, firm to in part very hard, well	
		cemented, dolomitic cement, colourless to cloudy white grains, very fine rare medium, sub	
		angular, fair sorted, partly as lamina in the claystone, poor visible porosity, silty matrix,	
		carbonaceous flakes and pyrite, shows: dull yellow fluorescence in part, no cut.	

DEPTH (ft)					
11780	90	CLAYSTONE: a/a.			
	10	SANDSTONE: a/a. occasional carbonaceous flakes, rare medium grains, in part very hard,			
		angular, brittle, dolomitic cement, dull orange yellow fluorescence.			
11800	85	CLAYSTONE: a/a.			
	15	SANDSTONE: a/a "rock" flour, light grey to off white, dull yellow fluorescence, no cut.			
11820	95	CLAYSTONE: a/a.			
	5	SANDSTONE: a/a			
11840	100	CLAYSTONE: a/a. abundant pyrite			
	Trace	SANDSTONE: a/a			
11860	100	CLAYSTONE: dark grey to dark brownish grey, dark greenish grey, firm, sub-blocky to blocky,			
11000	100	non calcareous, moderately silty in places, slightly micromicaceous.			
	Trace	SANDSTONE: a/a, occasionally very fine disseminated pyrite inclusions (secondar			
	Tracc	mineralization?)			
11880	95	CLAYSTONE: a/a, becoming silty disseminated pyrite and nodules.			
11000					
	5	SANDSTONE: very light grey, off white-white, translucent in places, common dark streaks and			
		laminations, predominantly as rock flour, very fine, moderately to well sorted, sub-rounded to			
		rounded, spherical, firm-friable, moderately cemented, slightly to moderately calcareous			
		cement, non to poor visual porosity.			
11900	95	CLAYSTONE: a/a, brownish grey in places, common silty.			
	5	SANDSTONE: a/a			
11920	100	CLAYSTONE: brownish grey, moderate brown to greyish brown, firm, sub-blocky to blocky,			
		sub-platy in places, non calcareous, predominantly moderately silty to silty, micromicaceous.			
	Trace	SANDSTONE: a/a			
11940 85 CLAYSTONE: a/a		CLAYSTONE: a/a			
	15	SANDSTONE: very light grey to medium light grey, off white, translucent in places, common			
		dark streaks and laminations, as rock flour in places, very fine, well sorted, firm to hard,			
		moderately to well cemented, slightly to moderately calcareous cement, non (tight) to poor			
		visual porosity.			
11952	50	CLAYSTONE: a/a			
(spot, <rop)< td=""><td>50</td><td>SANDSTONE: light grey to medium light grey, off white, rarely light to moderate brown,</td></rop)<>	50	SANDSTONE: light grey to medium light grey, off white, rarely light to moderate brown,			
		common dark streaks and laminations, predominantly as rock flour, very fine, moderately to			
		well sorted, sub-rounded to rounded, common spherical, friable, firm, poorly to moderately			
	cemented, slightly calcareous cement, argillaceous / silty matrix when brown, poor				
		porosity, shows: very light brown to very light yellowish brown direct UV, fast streaming bluish			
white cut UV colour (masked by OBM).					
11960	90	CLAYSTONE: brownish grey, dark yellowish brown, firm, sub-blocky to blocky, sub-platy in			
		places, non calcareous, moderately silty to silty in places, slightly micromicaceous.			
	10	SANDSTONE: a/a. Also@ frosted, translucent, very fine, hard, very well cemented, dolomitic			
	10	cement, no visual porosity, tight.			
11980	80	CLAYSTONE: a/a			
11300	20	SANDSTONE: a/a, predominantly seen as rock flour, very slightly calcareous cement, dolomitic.			
12000					
12000	40	CLAYSTONE: brownish grey, dark yellowish brown, moderate brown, occasionally light bluish			
		grey, firm, sub-blocky to blocky, sub-platy in places, common silty grading silty claystone,			
	60	micromicaceous, trace pyrite nodules.			
	60	SANDSTONE: very light grey to light grey, white-off white, brownish grey, occasionally light			
		bluish grey, rarely translucent, common dark laminations, predominantly as rock flour, very			
		fine, well sorted, sub-rounded to rounded, spherical, firm-friable, poorly to moderately			
		cemented, non to very slightly calcareous cement, dolomitic, argillaceous matrix in places			
		when brownish grey and bluish grey, poor visual porosity, shows: light yellowish brown to			
		bright yellow direct UV, moderately streaming yellowish white to bluish white cut UV colour			
		(masked by OBM).			
12020	75	CLAYSTONE: a/a, predominantly brownish grey to olive grey, dark greenish grey in places,			
		common silty, trace pyrite nodules.			
	10	SILTSTONE: brownish grey, moderate brown, dark spotted in places, firm-friable, blocky, very			
ĺ	I	slightly calcareous, argillaceous, common silt size quartz grains inclusions, grading very fine			

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION			
		argillaceous sandstone in places.			
	15	SANDSTONE: a/a, predominantly brownish grey, argillaceous matrix, occasionally smoky			
		quartz aggregates.			
12030	92	CLAYSTONE: dark grey, brownish black to olive black, dark grey brown, dusky yellow brown, in			
		part greenish black, firm to hard, sub-blocky to blocky, earthy, crumbly, moderately silty to			
		sandy in places, non calcareous, occasionally micromicaceous, disseminated micro-pyrite,			
		coaly fragments.			
	8	SANDSTONE: white to light grey, often with dark grey argillaceous streaks, crumbly, colourless			
		to translucent, very fine, sub rounded to sub angular, friable, weakly cemented, non			
12060	70	calcareous, white/light grey argillaceous matrix, poor visible porosity, no shows. CLAYSTONE: brownish grey, dark yellowish brown, occasionally light bluish grey and reddish			
12000	/0	brown, moderately firm to firm, friable, sub-blocky to blocky, sub-platy in places, non			
		calcareous, common silty grading silty claystone, slightly micromicaceous.			
	10	SILTSTONE: brownish grey, dark yellowish brown, friable, blocky, non calcareous, argillaceous,			
	10	grading to very fine sandstone in places.			
	20	SANDSTONE: very light grey to medium light grey, white-off white, common seen as rock flour,			
		brownish grey to dark yellowish grey in places, very fine, firm-friable, poorly to moderately			
		cemented, slightly calcareous, dolomitic cement, argillaceous matrix when brown, occasionally			
		argillaceous laminations, no visual porosity.			
12080	90	CLAYSTONE: a/a, predominantly moderately silty.			
	Trace	SILTSTONE: a/a			
	10	SANDSTONE: a/a			
12100	90	CLAYSTONE: a/a, occasionally reddish brown.			
	10	SANDSTONE: a/a			
12120	85	CLAYSTONE: a/a, moderately silty to silty in places.			
	15	SANDSTONE: a/a, as rock flour.			
12140	80	CLAYSTONE: a/a			
	20	SANDSTONE: a/a			
12160	70	CLAYSTONE: brownish grey to dark yellowish brown, moderately firm-friable, sub-blocky, sub-			
		platy in places, non calcareous, common moderately silty to silty grading silty claystone,			
	5	slightly micromicaceous. SILTSTONE: a/a			
	25	SANDSTONE: light grey, off white-white, brownish grey in places, rare translucent, seen as rock			
	23	flour, very fine to fine, firm-friable, poorly to moderately cemented, slightly to moderately			
		calcareous cement, argillaceous matrix when brown, no visual porosity, shows: patchy dull			
		yellowish brown direct UV, slow streaming dull yellowish white cut colour (masked by OBM).			
12180	85	CLAYSTONE: a/a			
	15	SANDSTONE: a/a, argillaceous laminations in places.			
12200	85	CLAYSTONE: medium grey to dark brown grey, moderately firm-friable, sub-blocky, sub-platy			
		in places, non calcareous, moderately silty to very silty grading Siltstone, pyrite.			
	15	SANDSTONE: light grey, off white-white, brownish grey in places, rare green/blue grey, as			
		"rock flour", very fine to fine, occasional medium grains, firm-friable, poorly to moderately			
		cemented, slightly to moderately calcareous cement, argillaceous, pyrite, no visual porosity,			
		shows: patchy dull yellowish brown direct UV, slow streaming dull yellowish white cut colour			
		(masked by OBM).			
12220	70	CLAYSTONE: medium grey to dark brown grey, moderately firm-friable, sub-blocky, sub-platy			
	20	in places, non calcareous, moderately silty to very silty grading siltstone, pyrite.			
	30	SANDSTONE: light grey, off white-white, medium grey in places, often as "rock flour", in parts			
		sandstone, colourless to translucent grains, very fine to fine, rare medium, sub angular, sub			
		spherical, firm-friable, poorly to moderately cemented, slightly to moderately calcareous cement, argillaceous matrix, pyrite, poor visual porosity, shows: patchy dull yellowish brown to			
		moderate yellow direct UV, very slow streaming dull yellowish white cut colour (masked by			
		OBM).			
12240	40	SANDSTONE: abundant "rock flour", off white, white, light grey, and aggregates- colourless to			
		translucent grains, very fine to fine, silty, friable, occasional medium grains, sub spherical,			

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION			
		glauconitic, laminated with grey argillaceous streaks, pyrite, in part loose quartz grains			
		colourless - translucent to white, very fine, rare medium, sub-angular, sub-spherical, fa			
		visible porosity in parts, very poor to moderate yellow fluorescence, very slow developing			
		white cut.			
	50	CLAYSTONE: a/a			
	10	SILTSTONE: medium grey, firm, friable, slightly calcareous, pyritic.			
12260	40	SANDSTONE: a/a white matrix, calcareous, glauconite, pyrite.			
	40	CLAYSTONE: medium grey, dark grey a/a			
	20	SILTSTONE: a/a			
12280	50	SANDSTONE: a/a occasional very pale green, blue grey, general even moderate to bright			
		yellow fluorescence, very weak slow developing cut.			
	10	CLAYSTONE: a/a			
	40	SILTSTONE: very sandy a/a.			
12300	30	SANDSTONE: light grey, off white-white, medium grey in places, often as "rock flour", in parts			
		sandstone, colourless to translucent grains, very fine to fine, rare medium, sub-angular, sub-			
		spherical, firm-friable, poorly to moderately cemented, slightly to moderately calcareous			
		cement, argillaceous matrix, pyrite, poor visual porosity, shows: patchy dull yellowish brown to			
		moderate yellow direct UV, very slow streaming dull yellowish white cut colour (masked by			
	10	OBM). CLAYSTONE: medium grey to dark brown grey, moderately firm-friable, sub-blocky, sub-platy			
	10	in places, non calcareous, moderately silty to very silty grading siltstone, trace disseminated			
		and nodules pyrite.			
	60	SILTSTONE: light grey, brownish grey, dark yellowish brown, friable, blocky, firm, crumbly, non			
		to slightly calcareous, grading to very fine sandstone in places.			
12320	90	SANDSTONE: a/a			
11010	10 SILTSTONE: a/a				
	Trace	CLAYSTONE: medium to dark grey, blocky, hard, non calcareous			
12340	90	SANDSTONE: a/a			
	10	SILTSTONE: a/a			
	Trace	CLAYSTONE: a/a			
12360	100	SANDSTONE: a/a white to off white, predominantly "rock flour", poor shows.			
	Trace	SILTSTONE: a/a			
12380	95	SANDSTONE: off white-white, light to medium grey in places, occasional very pale green, often			
		as "rock flour", in parts sandstone aggregates, colourless to translucent grains, very fine to			
		fine, sub angular to sub rounded, sub spherical, firm-friable, poorly to moderately cemented,			
		slightly to moderately calcareous cement, argillaceous matrix, glauconite specks, poor visual			
		porosity, shows: poor, patchy dull yellowish to moderate yellow direct UV, very slow			
	_	streaming dull yellowish white cut colour (masked by OBM).			
	5	SILTSTONE: light grey to medium grey, brownish grey, friable, blocky, firm to moderately hard,			
12400	00	blocky, crumbly, non to slightly calcareous, grading to very fine sandstone in places.			
12400	90	SANDSTONE: a/a			
12420	10	SILTSTONE: a/a SANDSTONE: a/a			
12420	90 10	SILTSTONE: a/a			
	Trace	CLAYSTONE: medium to dark grey, blocky, hard, non calcareous			
12440	70	SANDSTONE: a/a abundant rock flour, can look like limestone, very calcareous, occasional			
12770	'	coarse to very coarse grains.			
	30	SILTSTONE: medium grey, firm, blocky, crumbly, with quartz grain laminations.			
	Trace	CLAYSTONE: medium to dark grey, firm to hard, blocky, earthy, traces red brown, medium			
		green—Lithic?			
12460	25	CLAYSTONE: a/a, common silty, grading silty claystone.			
	75	SANDSTONE: light grey to medium light grey, off white, common seen as rock flour,			
		translucent in places, very fine grading silty in places, firm-friable, poorly to moderately			
		cemented, slightly to moderately calcareous cement, poor visual porosity, rare trace			
		transparent to translucent, coarse quartz grains, shows: dull yellowish brown direct UV, slow			

DEPTH (ft)	%	LITHOLOGICAL DESCRIPTION			
(-7		streaming yellowish cut colour (masked by OBM)			
12480	50	CLAYSTONE: brownish grey, dark yellowish brown, olive grey in places, firm-friable, blocky to			
		sub-blocky, sub-platy in places, non calcareous, common silty grading silty claystone, slightly			
		micromicaceous.			
	20	SILTSTONE: brownish grey to dark yellowish grey, firm-friable, blocky to sub-blocky, non			
		calcareous, common silt size quartz grains inclusions, argillaceous.			
	30	SANDSTONE: predominantly brownish grey to dark yellowish brown, light grey to medium light			
		grey in places, off white, very fine grading silt in places, moderately to well sorted, sub-angular			
		to sub-rounded, firm-friable, common argillaceous matrix, slightly to moderately calcareous			
		cement when light, no visual porosity.			
12500	100	CLAYSTONE: dark grey, dark brownish grey, firm-friable, blocky, sub-platy in places, non to			
		very slightly calcareous, common silty grading silty claystone, micromicaceous.			
	Trace	SANDSTONE: light grey to medium light grey, off white, as rock flour, very fine, firm, friable,			
		slightly to moderately calcareous cement, rare coarse quartz grains.			
	Trace	SILTSTONE: a/a, predominantly dark grey.			
12520	100	CLAYSTONE: a/a			
	Trace	SANDSTONE: a/a			
	Trace	SILTSTONE: a/a			
12540	100	CLAYSTONE: a/a, rare fine disseminated pyrite.			
	Trace	SANDSTONE: a/a, rare coarse quartz grains.			
	Trace	SILTSTONE: a/a			
12560	100	CLAYSTONE: dark grey, dark brownish grey, firm, sub-blocky to sub-platy, slightly calcareous			
		slightly to moderately silty, slightly micromicaceous.			
	Trace	DOLOMITE: (very rare): a/a, greenish grey in places.			
12580	100	CLAYSTONE: dark brownish grey to dark yellowish brown, firm, sub-blocky to blocky, no			
		calcareous, slightly to moderately silty, slightly micromicaceous.			
	Trace				
		crystalline, trace calcite.			
12600	100	CLAYSTONE: a/a, dark brownish grey to dark yellowish brown, rare coarse quartz grains.			
12615 TD	100	CLAYSTONE: dark grey to dark brownish grey, dark yellowish brown, rare greenish grey, firm,			
(BU)		friable, sub-blocky to blocky, very slightly calcareous to slightly calcareous, silty, grading silty			
		claystone.			
	Trace	SANDSTONE: very light grey, light greenish grey, very fine, friable, slightly calcareous cement.			

7. WIRELINE LOGGING OPERATIONS

Run	Logging tools	Interval	Date	Comments
#1A	RCI-DSL-GR	12534 -11428	16-18/05/11	Pretests in interval 12454 ft to 11951.3 ft: 26 total-9 good, 6 tight, 3 supercharged, 3 lost seal, 5 insufficient drawdown Fluid sampling: 2 bottles (840cc) x2 per depth (12454 ft and 12371.8 ft). DSL interval: 12535 ft to 11428 ft GR Interval: 11428 ft to 5852 ft Tool head temperature: 212 deg F Max Temperature: 216.2 deg F (sampling at 12454 ft) Pulled 8,500lbs to get free (2,600 at cable-head) after completed sampling at 12454 ft Pulled 10,200lbs and activate jars to get free (4,500 at cable-head) after completed sampling at 12371.8 ft Tool hangs at: 12250 ft, overpull at: 11,380ft, 11,330ft (jars fired), 11,080ft, 10,915ft, 9,555ft
#1B	Baker Atlas Earth Imager	9794 – 10606		E-Line
#1C	Baker Atlas RCI pressure & samples	11549 - 12084		E-Line
#1D	Baker Atlas Caliper	560 - 6006		E-Line

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

APPENDIX A: BHI mudlogging_Shipping Manifest_210/30a-4Y

APENDIX B: Gaia_BHI Wireline Timings Run #1_210-30a-4Y

BHI Wireline_Time Breakdown_210-30a-4Y

APENDIX C: RCI-DSL-GR Tooldiagram

APPENDIX D: BHI Wireline_RCI Fluid Samples Shipping Manifest_210-30a-4Y



Shipping Manifest

From: Inteq Unit 442 To: ASCO

O/B Transocean Prospect C/O Sterling Resources UK Ltd

Cladhan – 210/30a- 4Y

Boat Name: Havilla Fortress
Container No.: AMF 850

Dispatch date:

Peterhead

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

Set A:

9 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	6080 - 6640
2	A	Wet and Unwashed	6640 – 7420
3	A	Wet and Unwashed	7420 – 8260
4	A	Wet and Unwashed	8260 – 9020
5	A	Wet and Unwashed	9020 – 9860
6	A	Wet and Unwashed	9860 – 10620
7	A	Wet and Unwashed	10620 – 11440
8	A	Wet and Unwashed	11440 – 12060
9	A	Wet and Unwashed	12060 – 12615

Set B:

9 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	В	Wet and Unwashed	6080 - 6640
2	В	Wet and Unwashed	6640 – 7420
3	В	Wet and Unwashed	7420 – 8260
4	В	Wet and Unwashed	8260 – 9020
5	В	Wet and Unwashed	9020 – 9860
6	В	Wet and Unwashed	9860 – 10620
7	В	Wet and Unwashed	10620 – 11440
8	В	Wet and Unwashed	11440 – 12060
9	В	Wet and Unwashed	12060 – 12615

Sterling Resources UK Ltd.: 210/30a-4Y

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

Set C:

2 plastic wrapped packages (Each containing 3 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	6080 - 7420
2	C Washed and Dried		7420 - 8680
3	C	Washed and Dried	8680 – 10000
4	C	Washed and Dried	10000 - 11500
5	C	Washed and Dried	11500 – 12420
6	C	Washed and Dried	12420 – 12615

Set D:

2 plastic wrapped packages (Each containing 3 cardboard boxes)

Sterling Resources UK Ltd

British Geological Survey NGDC, Kingsley Dunham Centre Keyworth Nottingham

Nottingnam NG12 5GG

FAO: Scott Renshaw

Box No.	Set	Sample Type	Depth Interval		
1	D	Washed and Dried	6080 – 7420		
2	D	Washed and Dried	7420 – 8680		
3	D	Washed and Dried	8680 – 10000		
4	D	Washed and Dried	10000 - 11500		
5	D	Washed and Dried	11500 – 12420		
6	D	Washed and Dried	12420 - 12615		

Mud samples from Sterling well 210/30a- 4Y 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	Е	Mud Sample	6080 – 12615

Total Number of items: 23 19 green plastic boxes

4 plastic wrapped packages

Sterling Resources UK Ltd.: 210/30a-4Y

0.		F11	- •	Lo	st Time	Do	wn Time	D	uration	December
St	art	Fini	sn		hh:mm		hh:mm	d	hh:mm	- Description
Run 1A: RCI-GR										
16/5	20:30	20:45	16/5						00:15	Tool box talk
16/5	20:45	21:30	16/5						00:45	Rig up sheaves and compensator
16/5	21:30	22:20	16/5						00:50	Make up Run 1A
16/5	22:20	22:45	16/5						00:25	Surface checks
16/5	22:45	23:15	16/5						00:30	RIH from surface to 300ft, set compensator
40/5	00.45	00.05	40/5						00.40	Adjusting top-drive hoses so as not to interfer with the wireline &
16/5	23:15	23:25	16/5						00:10	compensator cables
										RIH from 300ft to casing shoe
40/5	00.05	00.00	47/5						04.05	Temperature stabilization at CS
16/5	23:25	03:30	17/5						04:05	RIH from CS to first pressure point @ 12325ft
										Correlation and stick test
17/5	03:30	08:30	17/5						05:00	Pressure tests
										Sample 1 and 2 @ 12454,0ft.
										Start pumping at 8:32, finish sampling at 11:32.
17/5	08:30	11:40	17/5						03:10	Total Pumped = 79 litres.
										Pulled 8.500lbs to get free (2.600 at cable-head)
17/5	11:40	11:55	17/5						00:15	Move to next sample depth. Correlation is on depth
17/5	11.40	11.55	17/3						00.13	Sample 3 and 4 @ 12371,8ft
17/5	11:55	15:20	17/5						03:25	Start pumping 12:05, finish sampling at 15:15.
17/3	11.55	13.20	17/3						03.23	Total Pumped = 81 litres.
										Pulled 10,200lbs and activate jars to get free (4,500 at cable-head).
17/5	15:20	15:30	17/5						00:10	
47/5	45.00	45.40	47/5						00.40	CHT data no longer being returned from tool
17/5	15:30	15:40	17/5						00:10	Move to next sample point
17/5	15:40	15:55	17/5				00:15		00:15	Logging Unit shuts down. Winch still operational. Start system and re-
										initialise tools. CHT data now being received again
17/5	15:55	16:15	17/5						00:20	RIH to correlate. Hang-up at 12,250ft.
17/5	16:15	16:25	17/5						00:10	Correlate from 12,250ft to 12,060ft. Shift depth -9ft
17/5	16:25	16:35	17/5						00:10	RIH to 12,350ft. Hang-up again at 12,250ft but pass through
17/5	15:55	16:45	17/5						00:50	Correlate from 12,350ft up to next pressure point at 12,269.8ft
17/5	16:45	18:25	17/5						01:40	Pressure tests
17/5	18:25	18:35	17/5						00:10	Correlate from 12,030ft to 11,986ft. Shift depth +2ft
17/5	18:35	18:50	17/5						00:15	Pressure tests - all points tight so third sample was not attempted
17/5	18:50	19:00	17/5						00:10	RIH to 12,600 ft
17/5	19:00	19:50	17/5						00:50	Log Spectral GR from 12,505ft up to 11,450 ft (BCU)
										Log GR up to Casing Shoe.
17/5	19:50	22:40	17/5						02:50	Over-pull at 11,380ft, 11,330ft (jars fired - CHT data lost), 11,080ft,
										10,915ft, 9,555ft
17/5	22:40	23:20	17/5						00:40	POOH to 300ft.
17/5	23:20	23:50	17/5						00:30	Release compensator and pull to surface
17/5	23:50	00:00	18/5						00:10	Tool-Box Talk concerning tool rig down
18/5	00:00	01:00	18/5						01:00	Rig down top part of tool.
18/5	01:00	01:30	18/5						00:30	Flush through tool with water
18/5	01:30	01:45	18/5						00:15	Verify Gamma-Ray & SpectralGamma-Ray
18/5	01:45	03:00	18/5						01:15	Rig down RCI Tool & Close Manual Tank Valves
18/5	03:00	03:30	18/5						00:30	Rig down Ker roof & close Mandar rank varves Rig down Sheaves & Compensator
10/0		ost Time	>				00:15		31:00	< Total operating time
The state of the s						Total operating time				
				D	hh:mm	D	hh:mm	Days	hh:mm	

```
Sun May 15 23:09:14 2011 Equipment onboard. Waiting to get tools out of rack.
Mon May 16 03:20:21 2011 Tools out of rack
Mon May 16 20:35:36 2011 TBT on drill floor.
Mon May 16 20:47:22 2011 Rig up tools
Mon May 16 22:13:38 2011 Surface check tools - all ok.
Mon May 16 22:51:14 2011 Tide Charts 2.5ft high
Mon May 16 22:52:19 2011 Zero tools at TTRm (49' --> 46.5' including tide)
Mon May 16 23:01:43 2011 TTRm Calibrated.
Mon May 16 23:05:57 2011 Mark line at 299.77' - set compensator.
Mon May 16 23:15:47 2011 Standby for compensator to be put on - hose rubbing.
Mon May 16 23:27:46 2011 Depth at Mark 318'. (-18.23' from sys depth)
Mon May 16 23:34:15 2011 Marked cable at dual wheel. Ran in to Floor new depth
= 512'
                   Distance = 512 - 299.77 = 212.23
Mon May 16 23:40:58 2011 Surface mark at 397'
Tue May 17 00:42:24 2011 Check tools at shoe. (146.3degF)
Tue May 17 00:52:50 2011 Csg mark 5799.6'
Tue May 17 02:55:33 2011 File1: GR tie-in pass (6ft added to file and system)
Tue May 17 03:13:01 2011 File2: GR tie-in pass 2 (from 12550' to 12325.3')
Tue May 17 03:20:02 2011 5 min stick test at 12325.5'
Tue May 17 03:27:39 2011 10min stick test at 12325.3'
                   File3: 12325.3' (No seal)
**Tue May 17 03:45:52 2011 File4: 12329.5 (Tight)
                    File5: Cancelled
**Tue May 17 04:01:52 2011 File6: 12347' (Tight?)
**Tue May 17 04:14:27 2011 File7: 12353.5 (Tight?)
**Tue May 17 04:28:33 2011 File8: Cancelled
**Tue May 17 04:30:30 2011 File9: 12363.5' (Tight?)
**Tue May 17 05:34:13 2011 File10: 12371.8' (Tight?)
Tue May 17 04:39:20 2011 File11: 12382' (Good Test).
Tue May 17 04:47:41 2011 File12: 12371.8' (Good Test)
Tue May 17 05:02:46 2011 File13: 12363.5'(Good Test)
Tue May 17 05:31:59 2011 File14: 12353.5' (Good Test)
Tue May 17 05:47:04 2011 File15: 12347' (Good Test)
Tue May 17 05:58:22 2011 File16: 12329.5' (Good Test) No repeat - pressure on trend
line.
Tue May 17 06:12:15 2011 File17: 12326' (Good Test) Rpt didn't pick on display.
Tue May 17 06:33:07 2011 File18: Depth tie from 12550' (-1.5' from system depth)2
Tue May 17 06:43:52 2011 File19: 12410.3' (First test no seal then second tight
- test cancelled)
Tue May 17 07:14:09 2011 File21: 12441.8' (good, rpt)
Tue May 17 07:50:52 2011 File22: 12449.3' Tight
Tue May 17 08:03:19 2011 File23: corr pass - on depth
Tue May 17 08:03:26 2011 File24: 12448.5'No seal, close and re-open - no seal
Sample point 1
                       12,454 ft
Tue May 17 08:20:15 2011 File25: 12454' Good, start pumping
                   filling 2PVT tanks after 79L
                   Could not drop off point so picked up
                   Pulled 8500 TTEN and 2600 CHT to get free
Tue May 17 11:49:03 2011 File26: Correlation pass - on depth
```

```
Tue May 17 11:56:21 2011 File 27: 12371.8' Good test, start pumping
Tue May 17 13:12:14 2011 RB stalling, switched to BB - similar pump rates
Tue May 17 15:02:50 2011 filling tanks after 81L before filling first of 2PVT's
Tue May 17 15:14:50 2011 Tanks flled, start post dd
Tue May 17 15:21:35 2011 try drop off, not gong down
Tue May 17 15:40:47 2011 Unit shut down, try pull up to diff tensions
Tue May 17 15:32:47 2011 Fired jars - TTEN 10,200, CHT 4,500 lbs
Tue May 17 15:50:34 2011 Start OCT again
Tue May 17 15:55:25 2011 RCI initial power up, start set up tool
Tue May 17 16:11:18 2011 File30: Correlation pass - shifted by -9ft
Tue May 17 16:14:02 2011 handing up 12315ft
Tue May 17 16:20:44 2011 hanging up at 12,240ft
Tue May 17 16:49:39 2011 File32: 12269.8ft Tight
Tue May 17 16:50:22 2011 File33: 12270.5ft Tight
Tue May 17 16:57:23 2011 File34: corr pass - added +0.8ft
Tue May 17 17:00:21 2011 File35: Sample attempt 12245.8ft s-ch? test + rpt...
Tue May 17 17:36:39 2011 File36: 12238ft not allowed to stab, v slow build up..
Tue May 17 18:02:31 2011 File37: 12221.5ft su-ch? test +rpt
Tue May 17 18:25:55 2011 File39: corr pass added 2ft to depth (not to file yet)
Tue May 17 18:35:00 2011 File40: 11988.5ft Tight
Tue May 17 18:52:56 2011 File41: 11951.3ft Tight
Tue May 17 18:55:02 2011 File42: Start rec DSL from 15ft above TD @ 12,600ft
Tue May 17 19:50:16 2011 Swact off DSL. at 11450'
Tue May 17 19:51:48 2011 Pulled 8900lbs at 11380'
Tue May 17 19:53:11 2011 Pulled 9400lbs at 11330' (CHT steady). Possibly fired
jars.
                         Lost cht & chv after jarring but GR still good.
Tue May 17 20:00:30 2011 Pulled 8000lbs at 11080
Tue May 17 20:06:21 2011 Pulled 6200 at 10915
Tue May 17 20:49:13 2011 Pulled 7500lbs at 9550'
Tue May 17 22:39:37 2011 In shoe (subtracted 4' from file42).
Tue May 17 22:40:53 2011 Stop record at 5860'
Tue May 17 23:16:39 2011 210.3ft dualwheel to rig floor
Tue May 17 23:17:50 2011 Surface mark at 398.3'
Tue May 17 23:41:26 2011 At surface 23.8ft
Wed May 18 01:03:01 2011 Pumping through RCI.
Wed May 18 01:37:53 2011 After ver GR
Wed May 18 01:44:10 2011 Cals done. continue rig down.
Wed May 18 03:00:51 2011 Rigged down tools.
Wed May 18 03:30:25 2011 Rigged down sheave wheels. Well handed back.
Wed May 18 03:48:43 2011 Temp therm: 212 deg F
```

INSTRUMENT CONFIGURATION

Source File: /dat1a/11075-3/RCI-tdg

DICITAL SPECTRALOG

	1 <u>44</u> .45'
MECHANICAL RELEASABLE CABLEHEAD	
Diameter : 3.38"	ſ)
Length : 4.39'	*
Weight : 48 lbs	
Series : 4460MA	
MECHANICAL RELEASABLE CABLEHEAD ELEC	f
Diameter : 3.38"	
Diameter : 3.38" Length : 1.88'	
SWIVEL	7
Diameter : 3.38" Length : 3.50'	
Length : 3.50'	
Weight : 68 lbs Series : 3944XD	
Series : 3944XD	
DOWNHOLE POWER ADAPTER	
Diameter : 3.62"	
Length : 5.27' Weight : 86 lbs	
Weight : 86 lbs Series : 4430XB	
Series : 4430XB	
t	
ROLLER	
Diameter : 3.38"	
Length : 3.33'	
Weight : 70 lbs Series : 3927NA	
Series : 392/NA	
The state of the s	1
ISI WIRELINE JAR	
Diameter : 3.50"	=
Length : 12.40'	
Weight : 287 lbs	
Series : SIJAR	
P P	
H	-
ROLLER	
ROLLER	
Diameter : 3.38"	
Length : 3.33'	
Weight : 70 lbs	
Diameter : 3.38" Length : 3.33' Weight : 70 lbs Series : 3927NA	
TTRM SUB	
TTRM SUB Digmeter : 3.63"	
TTRM SUB Diameter : 3.63" Length : 3.83'	TEMP MP
TTRM SUB Diameter : 3.63" Length : 3.83'	TEMP MP 107.89' RM MP 107.64'
TTRM SUB Digmeter : 3.63"	TEMP MP 107.89' RM MP 107.64'
TTRM SUB Diameter : 3.63" Length : 3.83'	TEMP MP 107.89' RM MP 107.64'
TTRM SUB Diameter : 3.63" Length : 3.83'	TEMP MP 107.89' RM MP 107.64'
TTRM SUB Diameter : 3.63" Length : 3.83'	TEMP MP 107.89' RM MP 107.64'
TTRM SUB Diameter : 3.63" Length : 3.83' Weight : 62 lbs Series : 3981XA WTS COMMON REMOTE	TEMP MP 107.89' RM MP 107.64'
TTRM SUB Diameter : 3.63" Length : 3.83' Weight : 62 lbs Series : 3981XA WTS COMMON REMOTE Diameter : 3.63"	TEMP MP 107.89' RM MP 107.64'
TITRM SUB Diameter : 3.63" Length : 3.83' Weight : 62 lbs Series : 3981XA WTS COMMON REMOTE Diameter : 3.63" Length : 6.36'	TEMP MP 107.89' RM MP 107.64'
TTRM SUB Diameter : 3.63" Length : 3.83' Weight : 62 lbs Series : 3981XA WTS COMMON REMOTE Diameter : 3.63" Length : 6.36'	TEMP MP 107.89' RM MP 107.64'
TTRM SUB Diameter : 3.63" Length : 3.83' Weight : 62 lbs Series : 3981XA WTS COMMON REMOTE Diameter : 3.63"	TEMP MP 107.89' RM MP 107.84'
TTRM SUB Diameter : 3.63" Length : 3.83' Weight : 62 lbs Series : 3981XA WTS COMMON REMOTE Diameter : 3.63" Length : 6.36'	TEMP MP 107.89' RM MP 107.64'

| 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 H/T

RCI ELECTRONICS SECTION H/T

RCI SINGLE PACKER SECTION (STD) H/T

RCI DRAW DOWN SECTION (56.7 CC) H/T

| Diameter : 4.75" | Length : 7.67' | Weight : 250 | lbs | Series : 1979BA

RCI SAMPLE PUMPTHRU SECTION (500 CC) H/T

Diameter: 4.75" Length: 7.89' Weight: 250 lbs Series: 1979RA GR MP 94.43'

GR MP 89.36'

PACKER MP 58.70'

IN-SITU FLUIDS EXPLORER : 4.87" : 10.15' : 200 lbs : 1970IC Diameter Length Weight Series RCI AUX POWER SECTION H/T Diameter : 4.75" Length : 8.82' Weight : 336 lbs Series : 19790A RCI SIX TANK SECTION WA W/TANKS H/T : 4.75" : 12.92' : 398 lbs : 1979WA Diameter Length Weight Series RCI WTS CROSSOVER SUB Diameter : 4.75" HOLEFINDER SECTION | Diameter : 3.63" | Length : 5.00' | Weight : 135 | Ibs | Series : 1678PB ROLLER HOLEFINDER SECTION : 3.67" : 3.40' : 70 lbs : 3928NA Diameter Length Weight Series BULL PLUG 3 3/8

TOTAL LENGTH: 144.45' TOTAL WEIGHT: 3854 lbs MAX DIAMETER: 0'4.87" 0.00'

SHIPPING MANIFEST

Stoneywood Park North, Dyce, Aberdeen.

Baker Atlas

Scotland. AB21 7EA Tel: (01224) 728500

Telex: 7395 Fax: (01224	70				
	1		-		
From:	Transocean Pro	ospect		Date 18 May 2011	
То:				S: ATTN EWAN THOMSON, CORE LABORATORIES (U.K) L' IAL ESTATE, DYCE, ABERDEEN, ABDERDEENSHIRE, AB21	
Quantity	Serial / Stock No.	I.D. No.	I.D. No.	DESCRIPTION OF GOODS	SRO Y/N
1		60180		MINI CONTAINER	
2	1974XA	369162	369212		
2	1974XA	369220	369222		
2				MUD SAMPLES	
NOTE:				BAKER ATLAS	
	SRO STATUS Y C LUMN ON RIGHT FEST			R. MACAULAY	
				Baker Atlas Representative	

REV. 971203