

# **Final Geological Well Report**

## **Kennetcook # 2**

**October 2007**

**For: Elmworth Energy Corporation  
Suite 1250, 521-3 rd Avenue SW  
Calgary Alberta  
T2P 3T3**

**By: E. Macdonald Geoconsulting Limited  
187 Chelsea Court  
New Glasgow Nova Scotia  
B2H 1V5**

## Table of Contents

Well Summary .....	- 2 -
Location.....	- 2 -
Well Objective .....	- 5 -
Well History .....	- 5 -
Formation Description and Evaluation .....	- 6 -
Primary Target     Horton Bluff Formation .....	- 6 -
Primary Target Evaluation .....	- 7 -
Well Data.....	- 8 -
Deviation Surveys .....	- 9 -
Formation Tops .....	- 10 -
Bit Information .....	- 11 -
Daily Particulars .....	- 13 -
Logging Particulars .....	- 15 -
Unit Descriptions .....	- 16 -

## List of Figures

Figure 1 : Geographical Location of Kennetcook # 2.....	- 3 -
Figure 2 : Close-up of the well locations .....	- 4 -
Figure 3 : Portion of the shale section in the upper Horton Bluff Formation .....	- 7 -
Figure 6 : Depth vs Operating Days chart for Kennetcook # 2 .....	- 28 -

Attachments: Geological striplog

## **Well Summary**

Kennetcook # 2 was drilled north of the village of Kennetcook Nova Scotia. The objective of the well was to explore for gas bearing carbonaceous shale in the Horton Bluff Formation of the Horton Group. The location for the well was picked from seismic signatures that corresponded with a rich shale section in Kennetcook # 1. At that location the interval was structurally higher. The second location tests the characteristics and extent of the shale package further basinward.

Secondary targets of interest were the sandstone packages in the upper portion of the Horton Bluff equivalent to the glass sand interval. These sections were identified as possible conventional gas reservoirs.

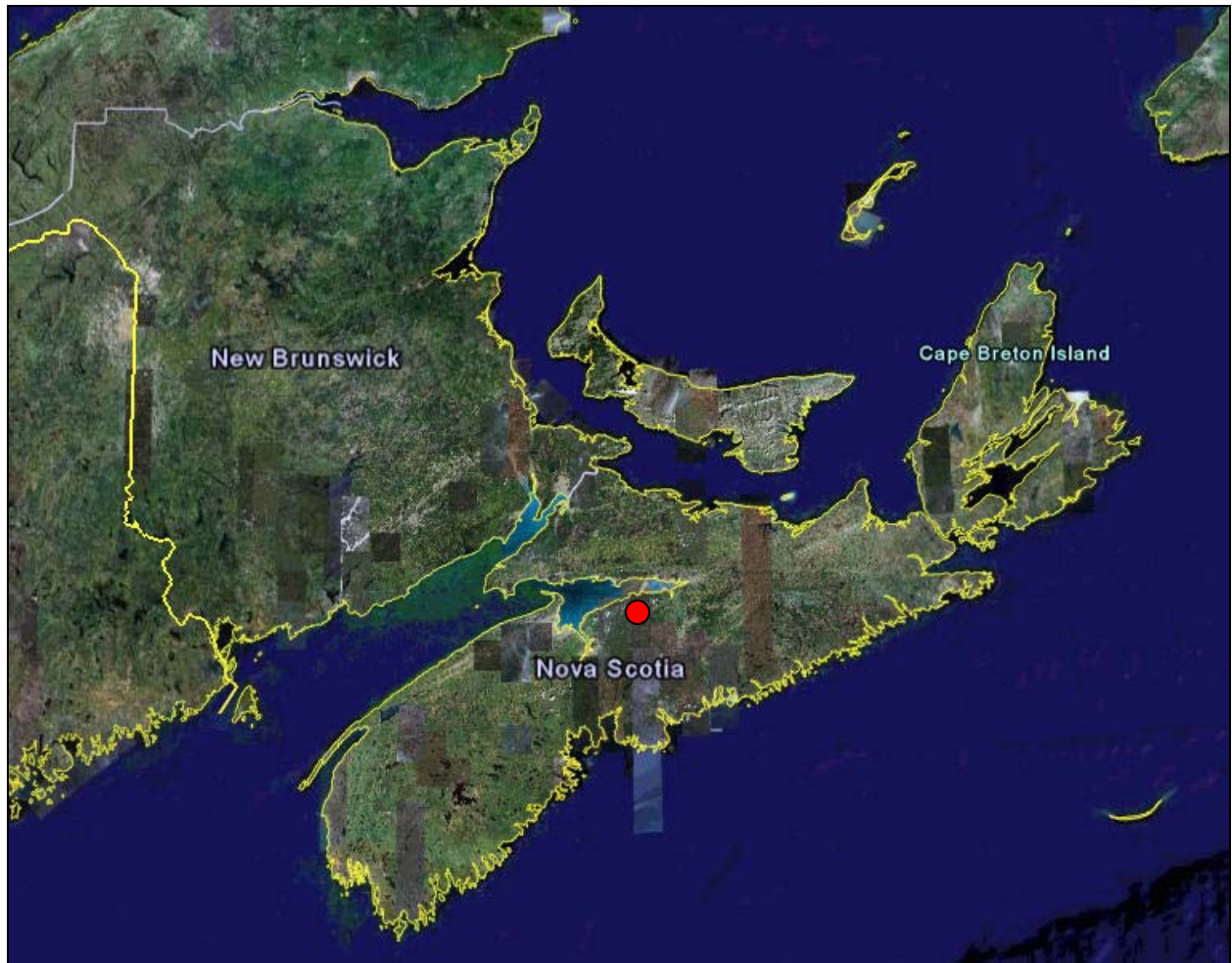
The well was operated by Elmworth Energy Corporation and is the second well that the company has drilled in the area in 2007. The well was drilled by Precision Drilling with Rig 176. The borehole spudded on Sept 18, 2007 at 15:00 hours and reached total depth on Oct 10, 14:23 hours. A drilling curve showing operating days verses depth is included as a figure in this report.

The prognosis called for the well to penetrate the Horton Bluff Formation at approximately 1050 meters measured depth from KB. The geophysical interpretation showed the well to be slightly down structure from Kennetcook # 1 which is approximately 3.4 kilometers to the E. The well design allowed for effective evaluation of the Horton Bluff Formation with wireline tools. The final total depth was called at 1935.0 meters measured depth from kelly bushing.

Geological supervision commenced on Sept 18, 2007 and continued until total depth. The well site geologist remained onsite to oversee wireline logging of the well. Supervision and reporting was performed by E. Macdonald Geoconsulting Limited.

## **Location**

The location of the well is roughly 3.5 kilometers NW from Kennetcook # 1 and 4.5 km north from the village of Kennetcook. Well centre coordinates are: Latitude: N 45-12-34.237 Longitude: W 063-42-24.460. Please refer to Figures 1 & 2 for the wells geographical location.



**Figure 1 : Geographical Location of Kennetcook # 2**



**Figure 2 : Close-up of the well locations**

## **Well Objective**

The objective of Elmworth Kennetcook # 2 was to investigate whether a shale sequence in Noel # 1 and Kennetcook # 1, (offset wells), extended onto the flank of the structural high. Also, if that shale interval did exist, was it sufficiently gas charged to support reservoir stimulation and deliver gas in economic amounts.

One possible secondary target was conventional reservoirs sandstones through the Horton Group. These proved to be of low porosity and permeability and showed low signs of gas potential.

Logging plans for formation evaluation called for TLD-CNL-HRLA-LDT-DSI-GPID-FMI and ECS performed by Schlumberger.

## **Well History**

The drilling program called for 244.5 mm surface casing to be set at approximately 280 metres. The well plan was to drill a vertical 200 mm hole to approximately 1480 meters. At this point a wireline unit was to be utilized to drill the remainder of the well to 1685 meters and continuously retrieve core. Drill cuttings sampling and descriptions, plus mud gas monitoring started from 280 meters and continued in five metre intervals until total depth.

The drill cuttings and mud gases were monitored during the coring program. The purpose of cutting the core is to seal and record the gas being released from the rock. It is important to get that core to surface as quickly as possible to ensure the smallest amount of gas is lost during the time it takes to pull the core and sample it.

The upper portion of the well encountered evaporates and salt which were not accounted for in the original geophysical interpretation. This results in a velocity adjustment through that portion of the section. The re-interpreted seismic predicted that basement and other tops would in fact be deeper than first expected.

Drilling penetration rate was slow through the Cheverie Formation due to the clay content in the red shale balling up the PDC bit. Several attempts to speed ROP by clearing the bit or using different drilling parameters and equipment failed to solve the problem.

The objective of the wireline coring program was to get continuous core through the rich shale interval encountered at Kennetcook # 1. This section was originally anticipated to begin at 1482 m. After retrieving 18 cores, the decision was made to drill ahead conventionally until mud gases increased or drill cuttings suggested a good shale interval. The shale interval was not encountered in significant thicknesses to warrant

coring and the coring equipment and crew were released. A total of 18 cores were taken from 1482 to 1602 meters.

The well did intersect carbonaceous shale which released formation gas between 1190 and 1495 meters. This is in the upper portion of the Horton Bluff and was not expected to be as rich a section. Further petrophysical, geological and geophysical evaluation will be required to determine the exact extent of the shale section in the area.

## **Formation Description and Evaluation**

### **Primary Target     Horton Bluff Formation**

1160 m MD to 1911.5 m MD Sample Depth

1139.5 m MD to 1904.5 m MD Log Depth

The shale sequence in the lower portion of the Horton Bluff Formation at Kennetcook # 1 was considered the main zone of interest for Kennetcook # 2. That shale section did not exist at Kennetcook # 2, but, carbonaceous shale between 1190 and 1495 meters does show a certain amount of gas saturation. The same shale section was in Kennetcook # 1, but it was stratigraphically higher in this well. The shale section in both wells was fairly organic rich and gave steady total gas readings while drilling.

At 1482.0 meters a coring bit was installed and the well was cored to 1602 meters. A total of 18 cores were taken. This core was sampled for gas absorption and certain intervals were preserved in wax for further analysis. Iso jar samples were also taken of certain cuttings and cores to test the gas content of the shale and associated siltstone and sandstone. Core sampling was performed in such a way as to gain a representative sampling of the entire section.

Through the richest intervals, it was common to see the core “bubbling” gas as it was taken from the core barrel.

An example of a description through the Horton Bluff Formation is as follows:

1316-1333 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1333-1340 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

A portion of the shale section is shown in figure 3.

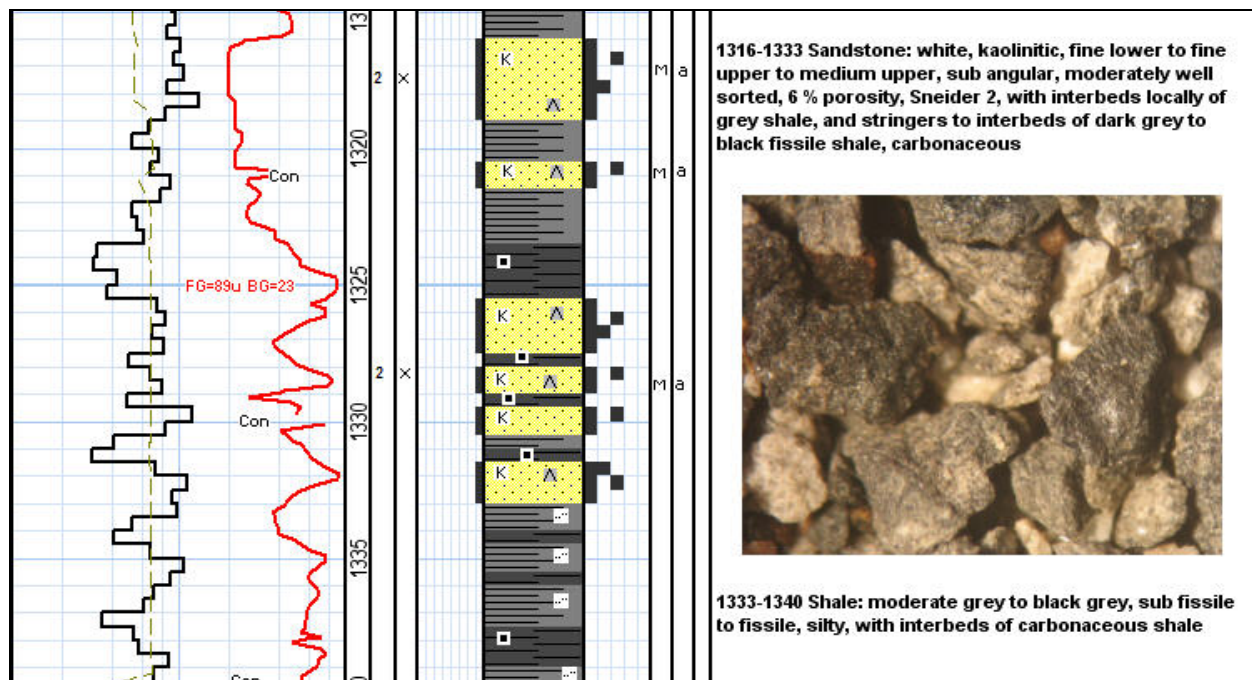


Figure 3 : Portion of the shale section in the upper Horton Bluff Formation

### Primary Target Evaluation

The section between 1190 and 1495 meters interval shows strong indications for shale gas saturation. Further geochemical, geological and engineering evaluation will be required to verify if the section is rich enough to support economic shale gas production.



### Well Data

WELL NAME	Kennetcook # 2
LEGAL LOCATION	11E-4C-73-B
UNIQUE WELL I.D.	na
SURFACE LOCATION	North from the town of Kennetcook
FIELD/REGION	Windsor Block
OPERATOR	Elmworth Energy Corporation

### SITE DATA

BOTTOMHOLE COORDINATES	Vertical Well		
SURFACE COORDINATES	N45-12-34.237 W063-45-24.460		
SEISMIC LOCATION	na		
WELL CLASSIFICATION	Vertical	WELL LICENSE #	99-09-15-02
A/E NUMBER	NA		
DRILLING CONTRACTOR	Precision Drilling Ltd. Rig 176		

### ELEVATIONS

GROUND LEVEL	90.30	(m)
KELLY BUSHING	94.80	(m)

### DRILLING DATES

SPUD DATE	September 18, 2007	TIME	15:00
T.D. DATE	October 10, 2007	TIME	14:23
RIG RELEASE DATE	na		

### HOLE SIZE & MUD TYPE

SURFACE	311 mm, Gel Chem
INTERMEDIATE	na
MAIN	200 mm, Gel Chem

### CASING DATA

SURFACE	21 joints of 244.5 mm / 53.57 kg/m, TSI
MAIN	
PRODUCTION	139.7 mm / 29.79 kg/m <sup>3</sup> , P110

### GEOLOGICAL DATA

SAMPLE INTERVAL	280 m to TD of 1935 m.
GAS DETECTION INTERVAL	280 m to TD of 1935 m.
CORES	Wireline coring while drilling from 1482 to 1602 m
LOGGING SUITE	Schlumberger, TLD-CNL-HRLA-LDT-DSI-GPID-FMI and ECS
DRILL STEM TESTS	None

### WELL STATUS

Suspended

### Deviation Surveys

<i>Depth</i>	<i>Inclination</i>	<i>Azimuth</i>	<i>TVD</i>
32	0.64	na	na
63	0.34	na	na
91	0.29	na	na
119	1.03	na	na
149	1.22	na	na
176	1.20	na	na
205	1.26	na	na
234	1.78	na	na
260	1.34	na	na
268	1.04	na	na
326	1.86	na	na
385	2.66	na	na
449	3.13	na	na
479	3.61	na	na
509	3.34	na	na
535	4.19	na	na
564	4.22	na	na
590	3.28	na	na
630	2.93	na	na
660	2.73	na	na
689	3.50	na	na
720	4.18	na	na
747	4.39	na	na
860	4.87	na	na
890	4.24	na	na
915	4.42	na	na
946	4.05	na	na
976	4.68	na	na
1005	3.8	na	na
1031	4.01	na	na
1059	4.56	na	na
1090	5.27	na	na
1119	5.6	na	na
1148	5	na	na
1203	5.11	na	na
1234	4.16	na	na
1272	4.25	na	na
1309	4.39	na	na
1345	3.91	na	na
1397	3.76	na	na
1460	2.77	na	na
1584	1.54	na	na
1680	2.68	na	na
1775	3.81	na	na
1872	4.15	na	na

### Formation Tops

<b>FORMATION</b>	<b>PROGNOSIS</b>			<b>SAMPLE</b>			<b>LOG</b>		
	<b>MD(m)</b>	<b>TVD(m)</b>	<b>SS(m)</b>	<b>MD(m)</b>	<b>TVD(m)</b>	<b>SS(m)</b>	<b>MD(m)</b>	<b>TVD(m)</b>	<b>SS(m)</b>
Windsor Group	300.0	300.0	-205.2	328.0	328.0	-233.2	10.0	na	84.8
Basal Anhydrite	650.0	650.0	-555.2	685.0	685.0	-590.2	802.5	na	-707.7
Cheverie	710.0	710.0	-615.2	809.5	809.5	-714.7	805.5	na	-710.7
Horton Bluff	1050.0	1050.0	-955.2	1160.0	1160.0	-1065.2	1139.5	na	-1044.7
Meguma	1600.0	1600.0	-1505.2	1911.5	1911.5	-1611.5	1904.5	na	-1809.7
TD	1625.0	1625.0	-1530.2	1935.0	1935.0	-1840.2	1935.0	na	-1926.0
* Primary target									

### Bit Information

<b>BIT #</b>	<b>1A</b>	<b>1B</b>	<b>1C</b>	<b>1</b>	<b>2</b>	<b>3</b>
<b>SIZE (mm)</b>	311	311	311	200	200	200
<b>MAKE</b>	Varel	FDS	Varel	Reed	Reed	Smith
<b>TYPE</b>	CH04JMRSV	FDS	CH04JMRSV	DSX816MB12	DSX816MB12	M616VPX
<b>SERIAL #</b>	230331	LR5543	230331	113053	113059	JW4176
<b>JETS Model</b>	3X18 Tricone	3X20 Tricone	3X18 Tricone	8X9.5 PDC	8X9.5 PDC	5X9.5 PDC
<b>DEPTH IN</b>	0.00	18.00	119.00	280.00	906.00	1028.00
<b>DEPTH OUT</b>	18.00	119.00	280.00	906.00	1028.00	1482.00
<b>METRES</b>	18.00	101.00	161.00	626.00	122.00	454.00
<b>HOURS</b>	3.75	17.50	32.00	57.25	20.75	57.75
<b>ACC. HRS.</b>	12.75	30.25	62.25	119.50	140.25	198.00
<b>ROP (m/hr)</b>	4.80	5.77	5.03	10.93	5.88	7.86
<b>FOB</b>	2000	5000	5-6000	2-6000	4-8000	2-4000
<b>RPM</b>	90	180	180	95	80.00	75
<b>PP</b>	2,850	3,000	6,500	5,000	5,000	4,000
<b>DEN</b>	1000	1000	1000	1110	1170	1160
<b>VISCOSITY</b>	28	28	28	35	37	36
<b>MAX DEV.°</b>	0.4°	0.5°	4.0°	5.0°	4.5°	4.0°
<b>Condition:</b>	<b>T/B/G</b>	<b>T/B/G</b>	<b>T/B/G</b>	<b>T/B/G</b>	<b>T/B/G</b>	<b>T/B/G</b>
<b>Condition:</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>
	na	na	na	na	na	na
	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>
	na	na	na	na	na	na
<b>REMARKS</b>						

<b>BIT #</b>	<b>1C</b>	<b>2C</b>	<b>3RR</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>SIZE (mm)</b>	200	200	200	200		
<b>MAKE</b>	Reed	Reed	Smith	Smith		
<b>TYPE</b>	PX-513	CSS543	M616VPX	PG9386		
<b>SERIAL #</b>	3317848	CSC	ER20550	FH128VPS		
<b>JETS Model</b>	5X12.7 Coring Bit	5X16 Coring Bit	5X9.5 PDC	12X11.1 PDC		
<b>DEPTH IN</b>	1482.00	1550.00	1626.50	1815.30		
<b>DEPTH OUT</b>	1550.00	1626.50	1815.30	1935.00		
<b>METRES</b>	68.00	76.50	188.80	119.70		
<b>HOURS</b>	20.25	23.75	48.50	33.75		
<b>ACC. HRS.</b>	218.25	242.00	290.50	324.25		
<b>ROP (m/hr)</b>	3.36	3.22	3.89	3.55		
<b>FOB</b>	4000	5000	7000	11000		
<b>RPM</b>	75	65	75	80		
<b>PP</b>	5,000	5,000	5,500	5,500		
<b>DEN</b>	1160	1160	1160	1170		
<b>VISCOSITY</b>	44	45	44	75		
<b>MAX DEV.°</b>	5.0°	2.0°	3.0°	4.0°		
<b>Condition:</b>	<b>T/B/G</b>	<b>T/B/G</b>	<b>T/B/G</b>	<b>T/B/G</b>	<b>T/B/G</b>	<b>T/B/G</b>
<b>Condition:</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>	<b>IR/OR/D/L</b>
	0-1-LC-S	1-1-BC-N	na	2-3-LT-M		
	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>	<b>B/G/O/RP</b>
	X-1-BT-PR	X-NO-BHA	na	E-1-BT-TD		
<b>REMARKS</b>	Coring Bit	Coring Bit	.	Tricone		

## Daily Particulars

			<b>Drilling</b>	<b>ROP</b>	<b>Mud Properties</b>				
<b>Date</b>	<b>Depth</b>	<b>Progress</b>	<b>Hours</b>	<b>(m/hr)</b>	<b>Density</b>	<b>Vis</b>	<b>WL</b>	<b>pH</b>	<b>Operations Summary</b>
18 Sep	17.0	17	3.75	4.53	1000	28	na	11.0	Drill 311 mm surface hole to 17 m.
19 Sep	129.0	112	20.5	5.46	1000	28	na	11.0	Drill 311 mm surface hole to 112 m.
20 Sep	249.0	120	22	5.45	1000	28	na	11.0	Drill 311 mm surface hole to 249 m.
21 Sep	280.0	31	8.75	3.54	1000	28	na	11.0	Drill 311 mm surface hole to 280 m .
22 Sep	280.0	na	na	#####	1000	28	na	11.0	WOC, weld on bowl, pressure test surface equipment, drill out cement, perform FLOT, begin drilling 200 mm hole.
23 Sep	518.0	238.00	16.00	14.88	1070	44	9	9.5	Drill 200 mm main hole to 518 m.
24 Sep	727.0	209.00	17.75	11.77	1120	37	11	10.5	Drill 200 mm main hole to 727 m.
25 Sep	821.0	94.00	18.25	5.15	1130	36	14	9.0	Drill ahead 200 mm main hole to 821 meters, POOH to check the bit; bit fine, RIH with same.
26 Sep	892.0	71.00	16.00	4.44	1160	36	17	10.5	Drill ahead 200 mm main hole to 844 m, POOH and drop motor, RIH and resume drilling 200 mm hole to 906 m, POOH to pick up new motor and bit.
27 Sep	1016.0	124.00	18.00	6.89	1170	40	17	10.5	RIH and resume drilling 200 mm main hole to 1016 m.
28 Sep	1144.0	128.00	16.00	8.00	1170	41	17	10.0	Drill ahead 200 mm main hole to 1027m, POOH for bit, RIH and resume drilling 200 mm main hole to 1144.
29 Sep	1249.0	105.00	15.00	7.00	1130	43	13	11.0	Drill 200 mm main hole to 1157 m, POOH to retrieve survey barrel, drill ahead 200 mm main hole to 1249.
30 Sep	1423.0	174.00	21.00	8.29	1130	44	13	11.0	Drill 200 mm main hole to 1423 m.
01 Oct	1482.0	59.00	8.75	6.74	1150	44	11	10.0	Drill 200 mm hole to 1482 m, wiper trip to the shoe, POOH, lay down collars, make up coring BHA.
02 Oct	1514.5	32.50	13.50	2.41	1140	47	8	10.5	RIH with coring bit, begin coring 200 mm main hole.
03 Oct	1550.0	35.50	19.00	1.87	1130	46	8	10.5	Core 200 mm hole to 1550 m.
04 Oct	1579.0	29.00	14.00	2.07	1130	46	8	10.5	POOH for bit, RIH with new bit, resume coring to 1579 m.
05 Oct	1626.5	47.50	9.00	5.28	1125	45	8	10.5	Core 200 mm hole to 1602 m, install insert and drill ahead 200 mm main hole to 1626.5 m.
06 Oct	1682.0	55.50	19.75	2.81	1110	45	8	10.0	POOH for bit, RIH with re-run, drill ahead 200 main hole to 1682 m.
07 Oct	1763.0	81.00	15.50	5.23	1110	42	8	9.5	Drill ahead 200 mm main hole to 1763 m.
08 Oct	1815.0	52.00	19.00	2.74	1110	42	8	9.5	Drill ahead 200 mm main hole to 1815 m, POOH, lay down coring equipment.
09 Oct	1902.0	87.00	19.75	4.41	1130	48	8	10.5	Drill ahead 200 mm main hole to 1902 m.

Kennetcook # 2  
Geological Well Report

10 Oct	1935.0	33.00	1.25	26.40	1110	75	8	10.0	Drill ahead 200 mm main hole to 1935 m, circulate to condition, POOH to log well, log well with Schlumberger.
11 Oct	1935.0	0.00	0.00	na	1110	75	8	10.0	RIH for wiper trip and run production casing.

## Logging Particulars

<i>HOLE DATA</i>			<i>MUD DATA</i>		<i>LOGGING COMPANY</i>	
Hole Size:	200 mm				Logging Co.:	Schlumberger
TD Driller:	1935.2		Type:	Gel Chem	Engineer:	L.Conway
Strap:	1935.4		Density:	1110	Truck No.:	162
TD Logger:	1358.4		Viscosity:	75	Start Date:	10-Oct-07
Casing Driller:	280		W.L.:	7.5	Start Time:	21:30
Casing Logger:	279.5		pH:	10.5	End Date:	11-Oct-07
Hole Condition:	Good		chlorides:	27500	End Time:	16:30
<b>LOGGING SEQUENCE</b>						
Run Number	Logged Interval		Hours	Logs	Remarks	
	From	To				
1	1935	280	7	TLD-CNL-HRLA-LDT	No Problems	
2	1935	307	7	DSI-GPID-FMI-ECS	FMI-ECS to 1140 m only	
<b>Total Hours:</b>			14	(Logging time)		
<b>LOGGING OPERATIONS SUMMARY</b>						
Date	From	To	Description of Operation			
09 Oct 07	15:00	15:15	Informed Schlumberger, (Sch) of 24 hour notice			
10 Oct 07	14:30	14:45	Informed Sch we reached 1358.4 m,(TD), to be on location by 08:00 hours			
10 Oct 07	21:30	21:45	On Location			
11 Oct 07	1:30	7:30	Run # 1, TLD-CNL-HRLA-LDT			
11 Oct 07	8:30	15:00	Run # 2, DSI-GPID-FMI-ECS			
11 Oct 07	15:00	22:30	Logs to client and Sch off location.			
<b>REMARKS &amp; COMMENTS</b>						



## Unit Descriptions

280-282 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity

282-299.5 Sandstone: orange brown to white, fine lower to medium lower grained, sub angular to sub rounded, moderate to well sorted, interbeds of light grey shale and red brown siltstone, poor to fair porosity, Sneider 1D

299.5-315 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity, local lenses and stringers of sandstone, as above

315-328 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity, local lenses and stringers of sandstone, as above

328-340 Siltstone: as above with inter beds of light grey limestone, mudstone, microcrystalline, silty locally, tight

340-360 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity, local lenses and stringers of limestone

360-373 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity

373-381 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity, local lenses and stringers of sandstone

381-400 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity

400-412 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout

412-416 Shale: light grey, blocky, silty, locally calcareous

416-420 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout

420-427.5 Shale: light grey, blocky, silty, locally calcareous

427.5-439.5 Anhydrite: snow white, dense, poor sample quality

439.5-454 Anhydrite: snow white, dense, poor sample quality, stringers and interbeds of limestone, grey, microcrystalline, as above

454-458 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout

458-475 Siltstone: red brown, grading to a very fine lower sandstone, interbeds of grey shale, locally slightly calcareous, minor thin limestone stringers, light to moderate grey, mudstone

475-495 Siltstone: red brown, grading to a very fine lower sandstone, stringers of grey shale, light to moderate grey

495-507 Siltstone: red brown, grading to a very fine lower sandstone, stringers of grey shale, light to moderate grey

507-510 Shale: light to moderate grey, blocky

510-514.5 Siltstone: as above

514.5-517.5 Shale: as above

517.5-520 Siltstone: as above

520-525 Sandstone: light grey white to grey white, very fine lower to fine lower, sub angular, very well sorted, very slightly calcareous, siltstone and grey silty shale stringers, hard, dense

525-532 Anhydrite: snow white, dense, stringers of limestone, grey, microcrystalline, as above

532-545.5 Limestone: dark grey, mudstone, very well cemented, grading to grainstone near the base of the unit

545.5-565 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local stringers of grey shale

565-585.5 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local stringers of grey shale

585.5-588 Interbedded Siltstone and Limestone: Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, Limestone is dark grey, mudstone, very well cemented

588-615 Siltstone: red to red brown, grading to very fine lower sandstone, sandy throughout, local stringers of grey shale

615-620 Anhydrite: snow white, dense, stringers of limestone, grey, microcrystalline, as above

620-645 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local stringers of grey shale

645-655 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local stringers of grey shale and anhydrite

655-675 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local anhydrite

675-680 Interbedded Siltstone and Shale: Siltstone is as above, Shale is moderate to dark grey, blocky, slightly calcareous

680-685 Sandstone: white to clear, poorly consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 to 9 % porosity, Sneider 1D to 1C

685-701.5 Gypsum: clear to white, selenite crystals, stringers to interbeds of red siltstone to grey shale, and sandstone

701.5-702.5 Anhydrite: Anhydrite: sandy lenses, common selenite crystals

702.5-703.5 Sandstone: white to clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1C

703.5-710 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

710-725 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

725-750 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

750-765 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

765-785 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

785-807 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

807-809.5 Limestone: Limestone: moderate to dark grey, mudstone, microcrystalline, dense, very hard, tight

809.5-826 Interbedded Sandstone, Siltstone and Shale: predominantly brick red siltstone and some light grey calcareous siltstone, micro micaceous, minor white to clear sandstone stringers, fine lower, well sorted, sub rounded, kaolinitic, siliceous, 6 to 9 % porosity, Sneider 1B to 2, trace grey shale

826-842 Siltstone: brick red siltstone, micro micaceous, minor white to clear sandstone stringers, as above

842-855 Interbedded Sandstone, Siltstone and Shale: predominantly brick red siltstone, micro micaceous, minor white to clear sandstone stringers, fine lower, well sorted, sub angular, siliceous, 6 to 9 % porosity, Sneider 2, minor conglomeratic sandstone

855-860 Sandstone: moderate grey, majority of the sample is disaggregated grains, very poorly consolidated, fine lower to fine upper, sub rounded, moderately well sorted, 6 to 9 % porosity, Sneider 1D

860-878 Siltstone: brick red siltstone, micro micaceous, minor white to clear sandstone stringers, to conglomeratic stringers, siltstone grades to very fine grained sandstone

878-882 Sandstone: moderate grey, poorly consolidated, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1D

882-890 Siltstone: brick red siltstone, micro micaceous, minor white to clear sandstone stringers, to conglomeratic stringers, siltstone grades to very fine grained sandstone

890-890.5 Sandstone: as above

890.5-910 Siltstone: brick red siltstone, micro micaceous, minor white to clear sandstone stringers, to conglomeratic stringers, siltstone grades to very fine grained sandstone

910-925 Sandstone: white to light grey white and clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1D, interbeds to stringers of clear fine grained sub rounded well sorted quartz arenite, slightly calcareous, and stringers of greenish grey shale

925-943 Sandstone: white to light grey white and clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1D, interbeds to stringers of clear fine grained sub rounded well sorted quartz arenite, slightly calcareous, and stringers of conglomeratic sandstone

943-947.5 Shale: light greenish grey and reddish brown, sub fissile, waxy, with stringers of sandstone as above

947.5-956.5 Sandstone: white to light grey white and clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity,

Sneider 1D, interbeds to stringers of clear fine grained sub rounded well sorted quartz arenite, and stringers of conglomeratic sandstone, local shale interbeds

956.5-963.5 Interbedded Grey and Red Shale: grey is light greenish grey, sub fissile, waxy, with stringers of sandstone as above, red is brick red, blocky, and silty throughout

963.5-970 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, grading to silty shale

970-985 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, with interbeds and stringers of grey shale and sandstone as above

985-1000 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, with interbeds and stringers of grey shale and sandstone as above

1000-1014.5 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, with interbeds and stringers of grey shale and sandstone as above

1014.5-1020 Sandstone: white to light grey white and clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1D, interbeds to stringers of clear fine grained sub rounded well sorted quartz arenite, slightly calcareous, and stringers siltstone as above

1020-1028 Interbedded Siltstone and Shale: as above, with local sandstone stringers

1028-1034 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, with interbeds and stringers of very fine grained sandstone, kaolinitic, calcareous, with thin lenses of conglomeratic sandstone

1034-1042 Siltstone: as above, interbedded with grey shale, silty

1042-1050 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone

1050-1060 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone as above

1060-1080 Interbedded Siltstone and Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone, brick red to brown red, micromicaceous, silty throughout, blocky

1080-1091.5 Interbedded Siltstone and Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone, brick red to brown red, micromicaceous, silty throughout, blocky

1091.5-1097.5 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone

1097.5-1110.5 Interbedded Siltstone and Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone, brick red to brown red, micromicaceous, silty throughout, blocky

1110.5-1115 Interbedded Siltstone and Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone, brick red to brown red, micromicaceous, silty throughout, blocky

1115-1125 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone

1125-1145 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone

1145-1160 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone

1160-1165 Sandstone: white to clear, quartz arenite, very loosely consolidated, trace kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 %porosity, Sneider 1C

1165-1188 Sandstone: white to clear, quartz arenite, very loosely consolidated, trace kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale

1188-1204 Sandstone: white to clear, quartz arenite, very loosely consolidated, trace kaolinite, fine lower to fine upper with some medium upper, sub rounded, moderately sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1204-1215 Sandstone: white to clear, quartz arenite, very loosely consolidated, trace kaolinite, fine lower to fine upper and medium, sub angular, moderately well sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1215-1234.5 Sandstone: white to clear, quartz arenite, very loosely consolidated, kaolinite, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1234.5-1240 Shale: moderate grey to black grey, sub fissile to fissile, silty

1240-1246.5 Sandstone: white to clear, quartz arenite, very loosely consolidated, kaolinite, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 %porosity, Sneider 2

1246.5-1253 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1253-1279.5 Sandstone: white to clear, quartz arenite, very loosely consolidated, kaolinite, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1279.5-1291 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1291-1294 Sandstone: as above

1294-1305 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1305-1316 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1316-1333 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1333-1340 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1340-1349 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1349-1353.5 Shale: as above

1353.5-1370.5 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1370.5-1374 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1374-1380 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1380-1384 Shale: as above

1384-1395 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1395-1410 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1410-1440 Sandstone: white, kaolinitic, fine lower to fine upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1440-1450 Shale: black, carbonaceous, locally silty, fissile to very fissile, with stringers of sandstone as above

1450-1465 Interbedded Sandstone and Shale: sandstone is white, kaolinitic, fine lower to fine upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1465-1483.5 Interbedded Sandstone and Shale: sandstone is white, kaolinitic, fine lower to fine upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous, degassing

1483.5-1486.5 Sandstone: sandstone is quartz arenite, white, kaolinitic, fine lower to fine upper, sub angular, well sorted, 6 % porosity, Sneider 2 to 1D, sandstone is bubbling slightly

1486.5-1488 Varved sandstone and black shale as above, local degassing

1488-1488.5 Shale: black carbonaceous

1488.5-1490.5 Sandstone: as above

1490.5-1492 Mixed Sandstone and Dark shale:

1492-1494 Shale: black, carbonaceous, locally silty, fissile to very fissile, local degassing signs

1494-1495.5 Mixed Shale and Sandstone: quartz arenite, white, kaolinitic, fine lower to medium upper, sub angular, well sorted, 6 % porosity, Sneider 2 to 1D, sandstone is bubbling slightly



1495.5-1503 Sandstone with thin wisps' of dark black shale, the shale is degassing

1503-1504 Varved Shale and Sandstone: as above

1504-1512.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium upper, sub angular, well sorted, 6 % porosity, Sneider 2 to 1D, with local stringers to interbeds of black carbonaceous shale

1512.5-1518 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium upper, sub angular, well sorted, 3 % porosity, Sneider 2 to 1D, with local stringers to interbeds of black carbonaceous shale

1518-1540 Sandstone: quartz arenite, white, kaolinitic, fine lower to coarse grained, sub angular, well sorted, 3 % porosity, Sneider 2 to 1D, with local stringers to interbeds of black carbonaceous shale

1540-1542 Shale: black, carbonaceous, locally silty, fissile to very fissile, local degassing signs

1542-1553 Sandstone: quartz arenite, white, kaolinitic, fine lower to coarse grained, sub angular, well sorted, 3 % porosity, Sneider 2 to 1D

1553-1554 Shale: black, carbonaceous, plant fragments, bordering on coal, degassing bubbles

1554-1556.5 Sandstone: as above

1556.5-1558.5 Varved Sandstone and Shale grading to Shale: black, carbonaceous, plant fragments, bordering on coal, degassing bubbles, bioturbated, burrowed

1558.5-1561 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 3 % porosity, Sneider 2 to 1D, with local stringers to interbeds of black carbonaceous shale

1561-1571 Sandstone: as above with interbeds of carbonaceous shale and varved sandstone and shale

1571-1579.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1579.5-1587 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1587-1594.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1594.5-1610 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1610-1625 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1625-1635 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1635-1648 Interbedded Sandstone and Shale: sandstone is white, kaolinitic, fine lower to medium upper, sub angular, moderately well sorted, 3 % porosity, Sneider 2, with interbeds locally of grey shale

1648-1665.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1665.5-1667 Varved Sandstone and Shale grading to Shale: black

1667-1680 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1680-1695 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1695-1702.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1702.5-1715 Sandstone as above interbedded with and varved with silty carbonaceous shale

1715-1725 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with interbeds of black carbonaceous shale and varved shale and sandstone

1725-1740 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with interbeds of black carbonaceous shale and varved shale and sandstone

1740-1756.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with interbeds of black carbonaceous shale and varved shale and sandstone

1756.5-1770.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with interbeds of black carbonaceous shale and grey silty shale and sandstone

1770.5-1790 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with stringers to interbeds of black carbonaceous and grey silty shale

1790-1800 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, moderately sorted, 1 to 3 % porosity, Sneider 2, with stringers to interbeds of black carbonaceous and grey silty shale

1800-1815 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, moderately sorted, 1 to 3 % porosity, Sneider 2, with stringers to interbeds of black carbonaceous and grey silty shale

1815-1830 Sandstone: quartz arenite, white and clear, kaolinitic, fine lower to coarse grained, sub angular, moderately sorted, 1 to 2 % porosity, Sneider 2, with stringers grey silty shale

1830-1845 Sandstone: quartz arenite, white and clear, kaolinitic, fine lower to coarse grained, sub angular, moderately sorted, 1 to 2 % porosity, Sneider 2, with stringers grey silty shale

1845-1860.5 Sandstone: quartz arenite, white and clear, kaolinitic, fine lower to coarse grained, sub angular, moderately sorted, 1 to 2 % porosity, Sneider 2, with stringers grey silty shale

1860.5-1882.5 Sandstone: quartz arenite, white and clear, kaolinitic, fine lower to coarse grained, sub angular, moderately sorted, 1 to 2 % porosity, Sneider 2, with stringers grey silty shale

1882.5-1883.5 Shale: dark grey, silty, blocky, with stringers of carbonaceous shale and thin laminated coal stringers, coal shows degassing signs on coarse undried cuttings

1883.5-1888 Sandstone: as above

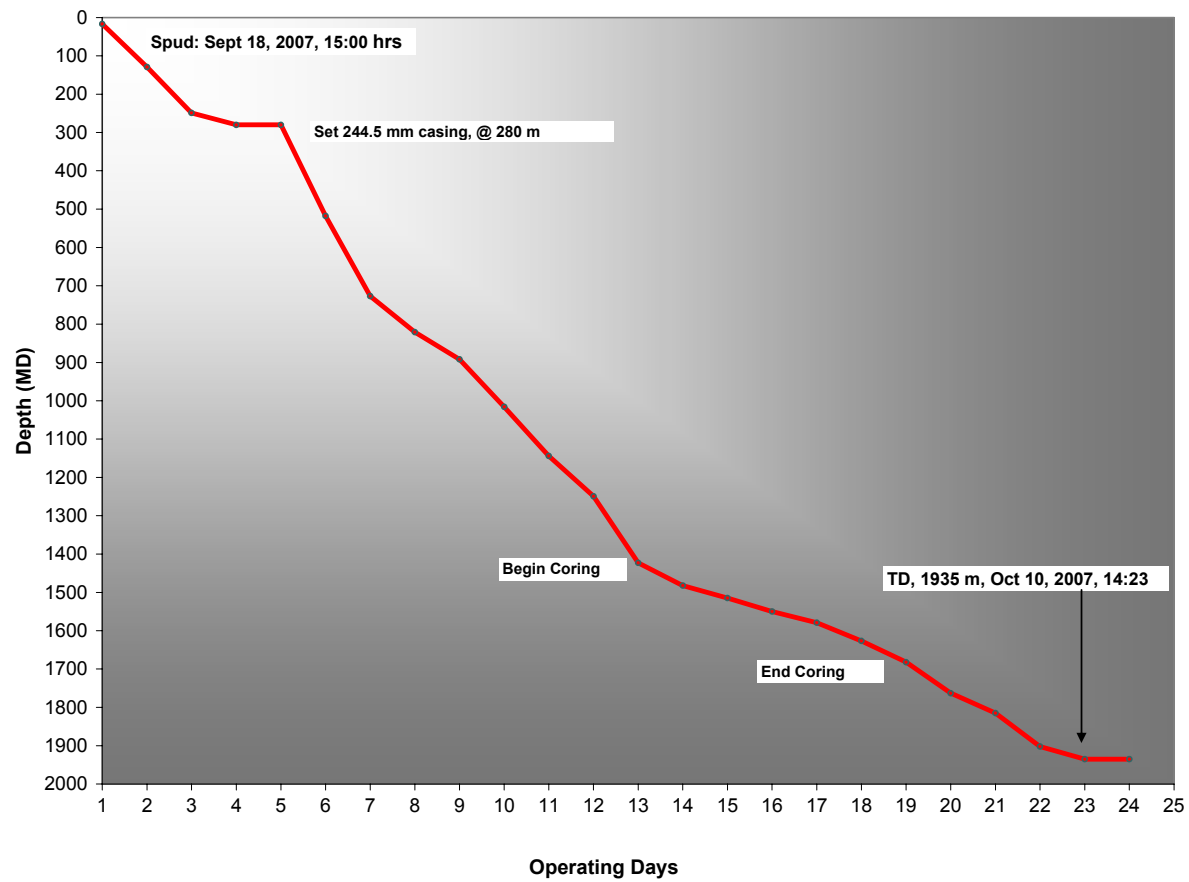
1888-1889.5 Shale: dark grey, silty, blocky, with stringers of carbonaceous shale and thin laminated coal stringers

1889.5-1901.5 Sandstone: as above

1901.5-1905.5 Shale: interbedded grey silty shale and black carbonaceous shale, coal laminae, undried samples show degassing signs

1905.5-1911.5 Sandstone: quartz arenite, white and clear, kaolinitic, fine lower to coarse grained, sub angular, moderately sorted, 1 to 2 % porosity, Sneider 2, with stringers grey silty shale

1911.5-1935 Quartzite: light greenish cream, schistose texture, minor pyrite crystals



**Figure 4 : Depth vs Operating Days chart for Kennetcook # 2**



Scale 1:240 (5"=100') Metric

Well Name: Kennetcook # 2  
 Location: 5.5 km north from Village of Kennetcook  
 Licence Number: 99-09-15-02  
 Spud Date: Sept 18, 2007  
 Surface Coordinates: N 45-12-34.237 W063-45-24.460

Region: Kennetcook NS  
 Drilling Completed: Oct 10, 2007

Bottom Hole Coordinates: N 45-12-34.237 W063-45-24.460

Ground Elevation (m): 90.3 K.B. Elevation (m): 94.8  
 Logged Interval (m): 280 To: 1935 m Total Depth (m): 1935 m  
 Formation: Horton Bluff Formation  
 Type of Drilling Fluid: Gel Chem

Printed by STRIP.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

## OPERATOR

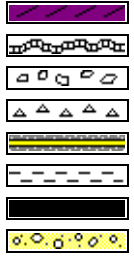
Company: Elmworth Energy Cooperation  
 Address: Suite 1250  
 521 - 3 rd Avenue SW  
 Calgary, AB, Canada

## GEOLOGIST

Name: Edwin Macdonald, P. Geol  
 Company: E. Macdonald Geoconsulting Limited  
 Address: 187 Chelsea Court  
 New Glasgow, NS, Canada  
 B2H 1V5

## ROCK TYPES

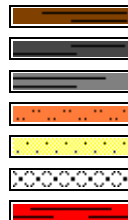
### LITHOLOGY



Anhy  
 Bent  
 Brec  
 Cht  
 Varved ss  
 Clyst  
 Coal  
 Congl



Dol  
 Gyp  
 Igne  
 Lmst  
 Meta  
 Mrlst  
 Salt  
 Red silty shale  
 Shale



Shcol  
 Shdkgy  
 Shgy  
 Sltst  
 Ss  
 Till  
 Shale rd

### STRINGER



Cngl  
 Anhy  
 Arg  
 Bent  
 Coal  
 Dol  
 Gyp  
 Ls



Mrst  
 Shale red  
 Sh br  
 Dark shale  
 Shale  
 Sltstrg  
 Ssstrg

## ACCESSORIES

### CEMENT

Calcareous  
Siliceous

### FOSSIL

Algae  
Amph  
Belm  
Bioclst  
Brach  
Bryozoa  
Cephal  
Coral  
Crin  
Echin  
Fish  
Foram

F

G

O

O

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

P

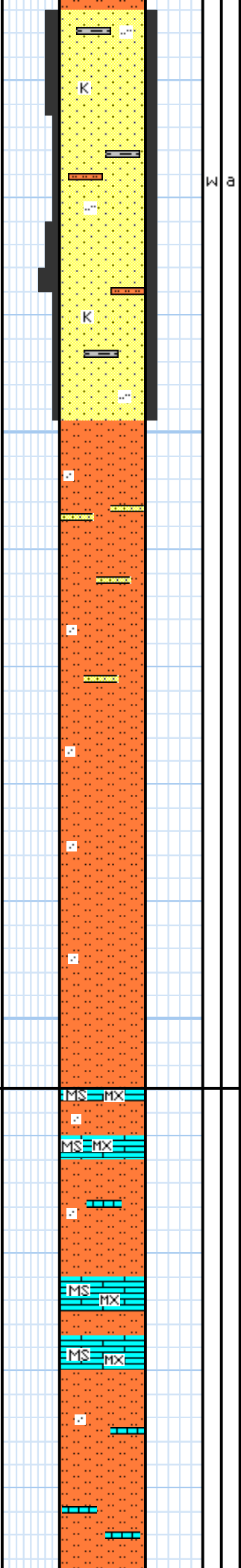
P

P

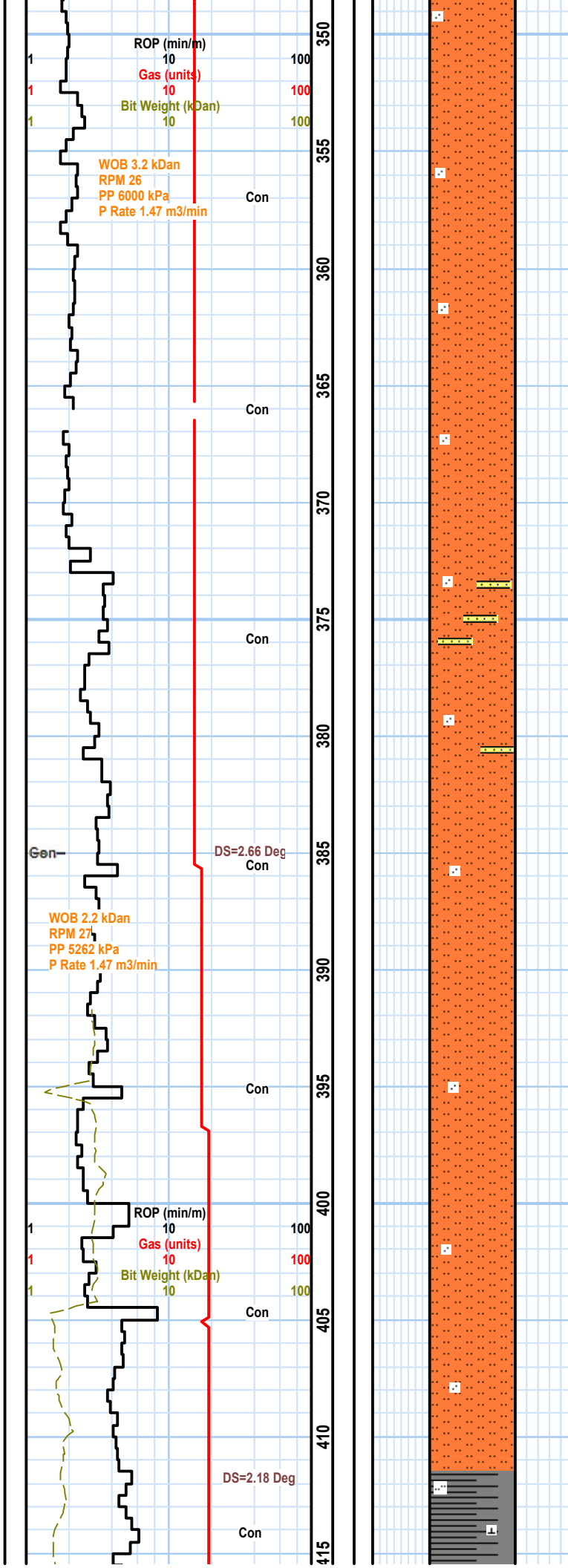
P

P

**340-360 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity, local lenses and stringers of limestone**







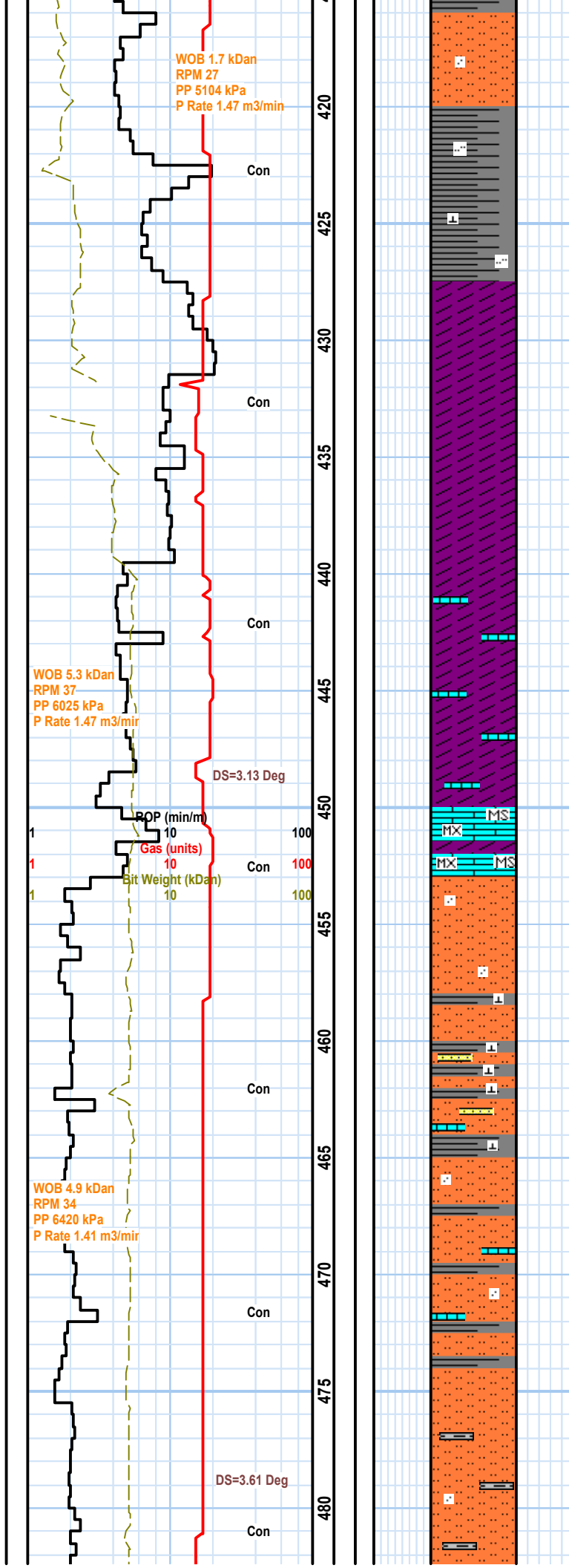
360-373 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity

373-381 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity, local lenses and stringers of sandstone

381-400 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, poor porosity

400-412 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout

412-416 Shale: light grey, blocky, silty, locally calareou



416-420 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout

420-427.5 Shale: light grey, blocky, silty, locally calareou

427.5-439.5 Anhydrite: snow white, dense, poor sample quality

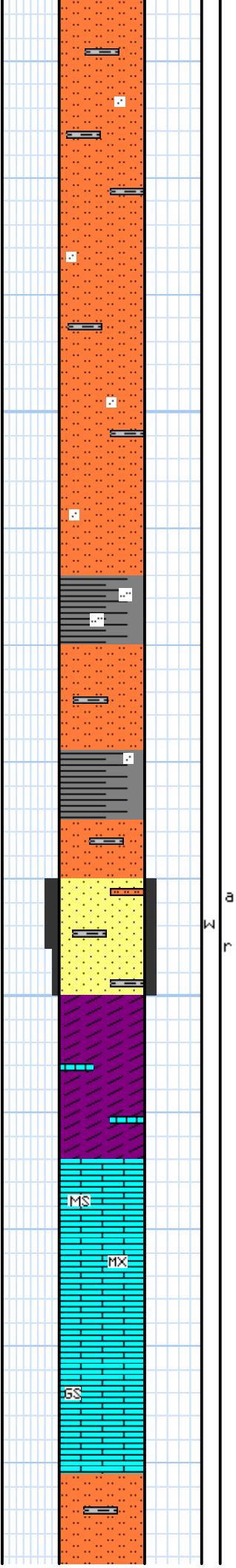
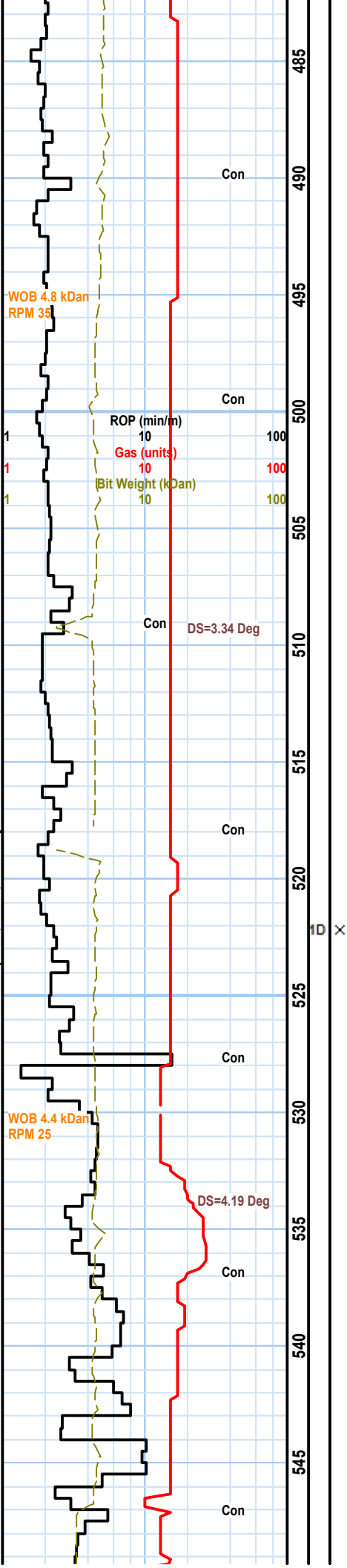
439.5-454 Anhydrite: snow white, dense, poor sample quality, stringers and interbeds of limestone, grey, microcrystalline, as above

454-458 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout

458-475 Siltstone: red brown, grading to a very fine lower sandstone, interbeds of grey shale, locally slightly calcareous, minor thin limestone stringers, light to moderate grey, mudstone

475-495 Siltstone: red brown, grading to a very fine lower sandstone, stringers of grey shale, light to moderate grey

Sept 24, 2007, 00:00



495-507 Siltstone: red brown, grading to a very fine lower sandstone, stringers of grey shale, light to moderate gre

507-510 Shale: light to moderate grey, block

510-514.5 Siltstone: as above

514.5-517.5 Shale: as above

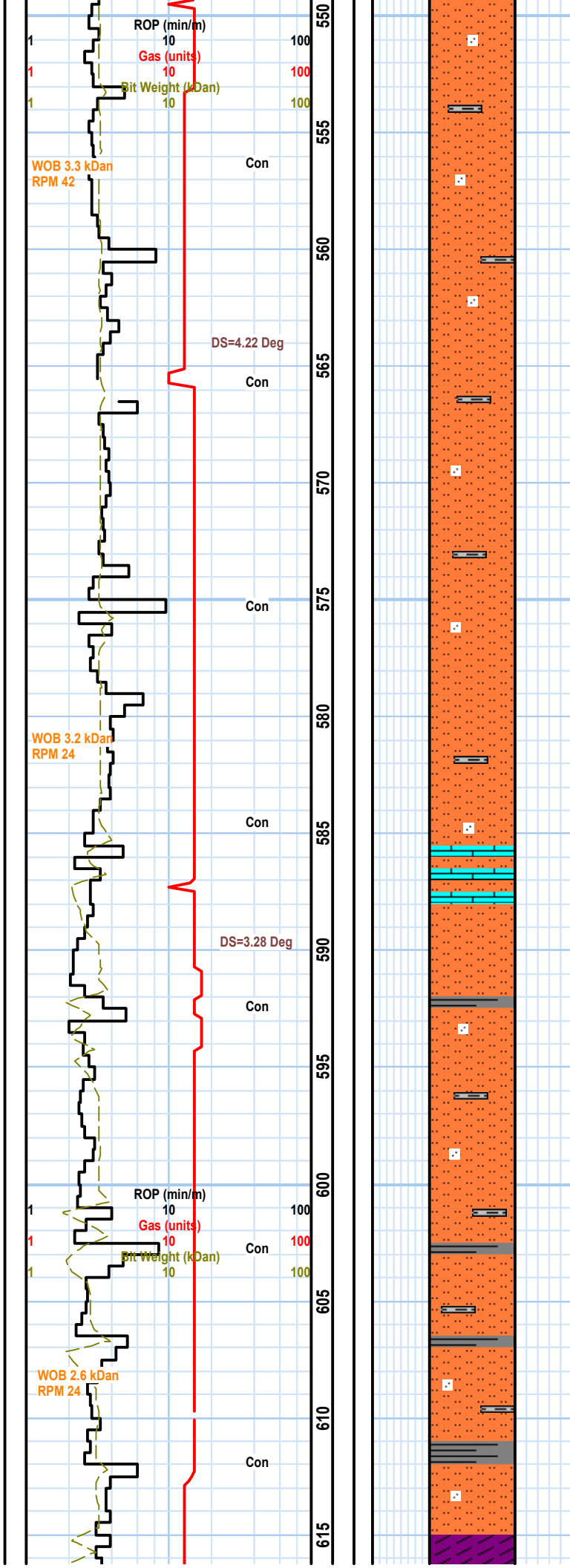
517.5-520 Siltstone: as above

520-525 Sandstone: light grey white to grey white, very fine lower to fine lower, sub angular, very well sorted, very slightly calcareous, siltstone and grey silty shale stringers, hard, dense

525-532 Anhydrite: snow white, dense, stringers of limestone, grey, microcrystalline, as above

532-545.5 Limestone: dark grey, mudstone, very well cemented, grading to grainstone near the base of the unit

545.5-565 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local stringers of grey shale



565-585.5 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local stringers of grey shale

585.5-588 Interbedded Siltstone and Limestone: Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, Limestone is dark grey, mudstone very well cemented

588-615 Siltstone: red to red brown, grading to very fine lower sandstone, sandy throughout, local stringers of grey shale

615-620 Anhydrite: snow white, dense, stringers of limestone,

**620-645 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local stringers of grey shale**

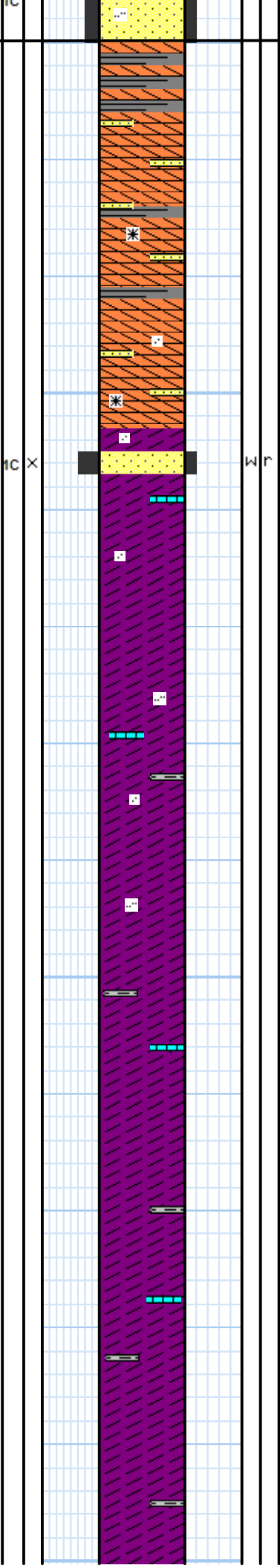
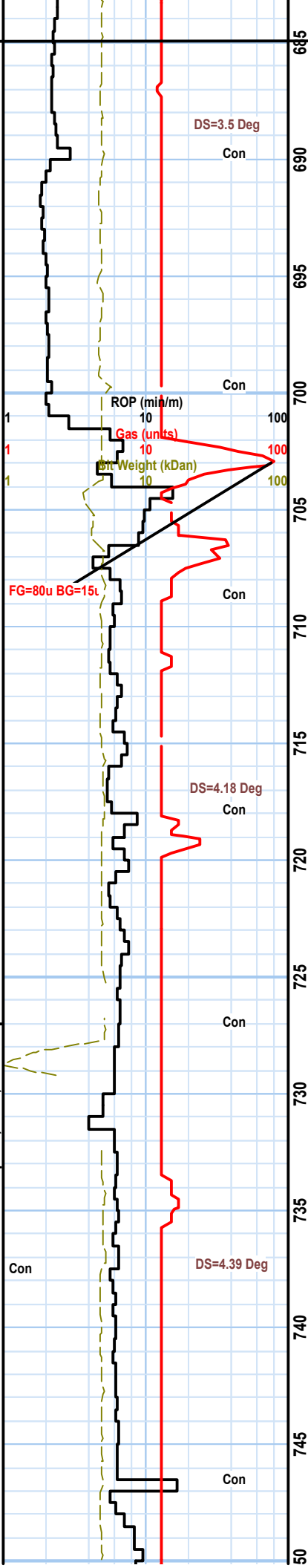
**645-655 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local stringers of grey shale and anhydrite**

**655-675 Siltstone: red to red brown, grading to very fine lower sandstone, very slightly calcareous, sandy throughout, local anhydrite**

**675-680 Interbedded Siltstone and Shale: Siltstone is as above, Shale is moderate to dark grey, blocky, slightly calcareous**

**680-685 Sandstone: white to clear, poorly consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 to 9 % porosity, Sneider 1D to 1C**

Sept 25, 2007, 00:00



## Top Basal Anhydrite 685.0 m MD

685-701.5 Gypsum: clear to white, selenite crystals, stringers to interbeds of red siltstone to grey shale, and sandstone

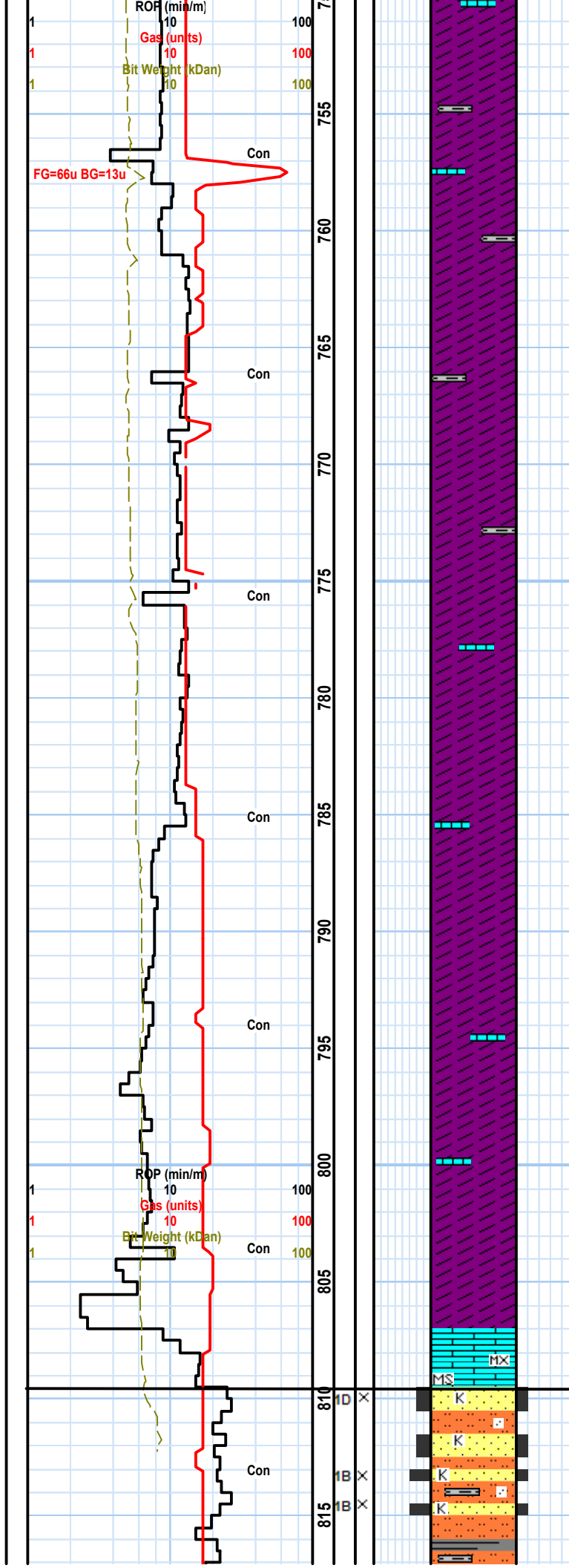
701.5-702.5 Anhydrite: Anhydrite: sandy lenses, common selenite crystals

702.5-703.5 Sandstone: white to clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1C

703.5-710 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

710-725 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

725-750 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above



750-765 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

765-785 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

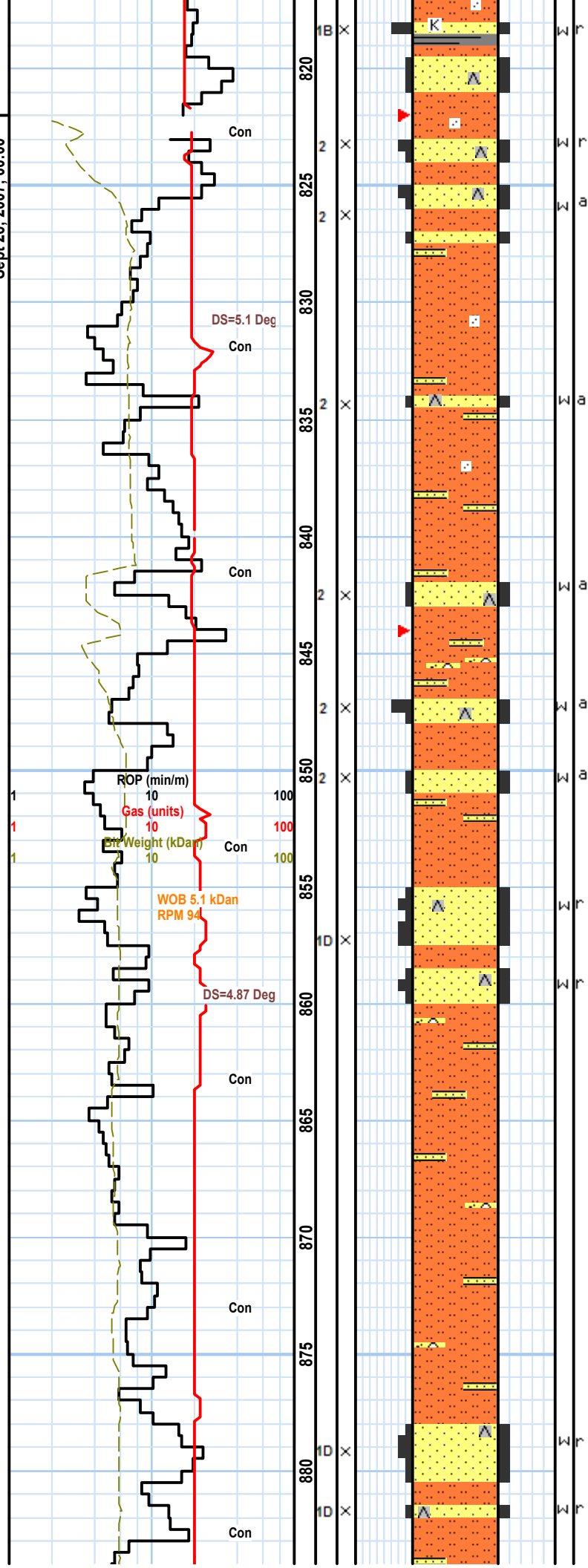
785-807 Anhydrite: white to light grey white, massive, minor thin limestone stringers and grey shale stringers, as above

807-809.5 Limestone: Limestone: moderate to dark grey, mudstone, microcrystalline, dense, very hard, tight

### Top Cheverie Formation 809.5 m MD

809.5-826 Interbedded Sandstone, Siltstone and Shale: predominantly brick red siltstone and some light grey calcareous siltstone, micro micaceous, minor white to clear sandstone stringers, fine lower, well sorted, sub rounded, kaolinitic, siliceous, 6 to 9 % porosity, Sneider 1B to 2, trace grey shale

**Sept 26, 2007, 00:00**



Bit trip to check the bit; bit was fine, RIH with same.

**826-842 Siltstone: brick red siltstone, micro micaceous, minor white to clear sandstone stringers, as above**

**Bit trip to drop the motor.  
Back in with bit only.**

**842-855 Interbedded Sandstone, Siltstone and Shale:** predominantly brick red siltstone, micro micaceous, minor white to clear sandstone stringers, fine lower, well sorted, sub angular, siliceous, 6 to 9 % porosity, Sneider 2, minor conglomeratic sandstone

855-860 Sandstone: moderate grey, majority of the sample is disaggregated grains, very poorly consolidated, fine lower to fine upper, sub rounded, moderately well sorted, 6 to 9 % porosity, Sneider 1D

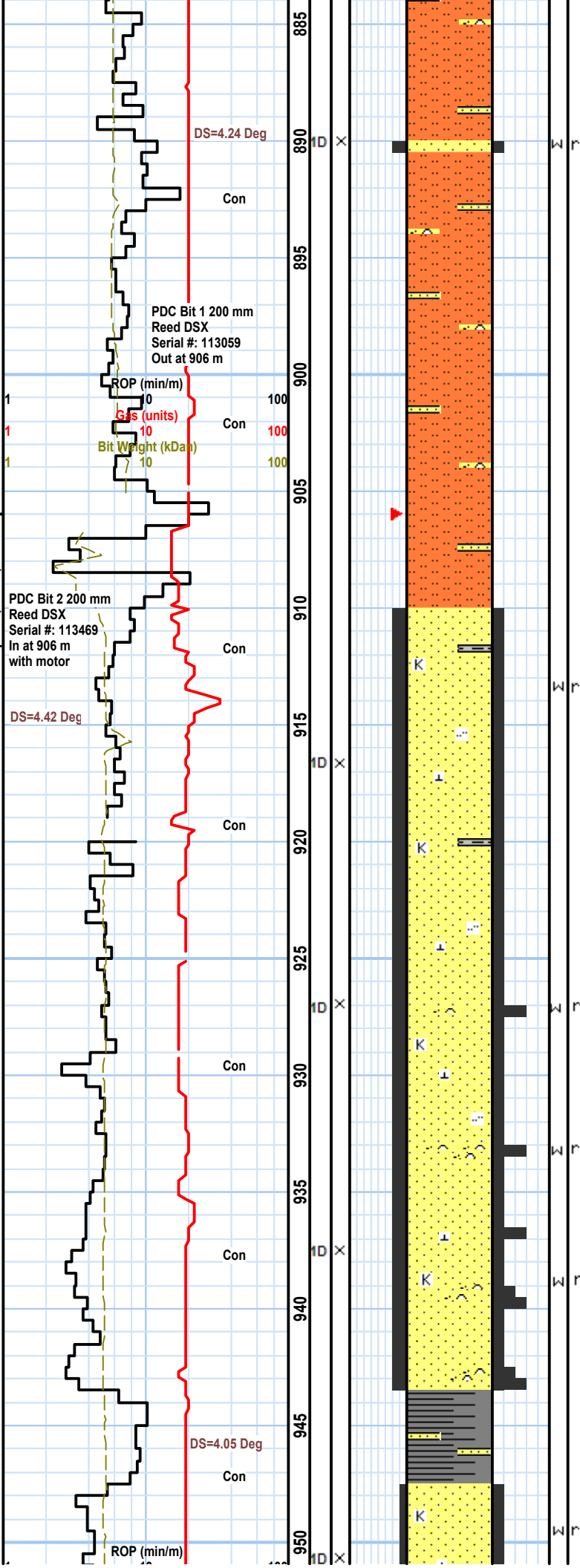
**860-878 Siltstone: brick red siltstone, micro micaceous, minor white to clear sandstone stringers, to conglomeratic stringers, siltstone grades to very fine grained sandstone**

878-882 Sandstone: moderate grey, poorly consolidated, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1D

**882-890 Siltstone:** brick red siltstone, micro micaceous, minor white to clear sandstone stringers to conglomeratic stringers



Sept 27, 2007, 00:00



white to clear sandstone stringers, to conglomeratic stringers  
siltstone grades to very fine grained sandstone

890-890.5 Sandstone: as above

890.5-910 Siltstone: brick red siltstone, micro micaceous, minor white to clear sandstone stringers, to conglomeratic stringers, siltstone grades to very fine grained sandstone

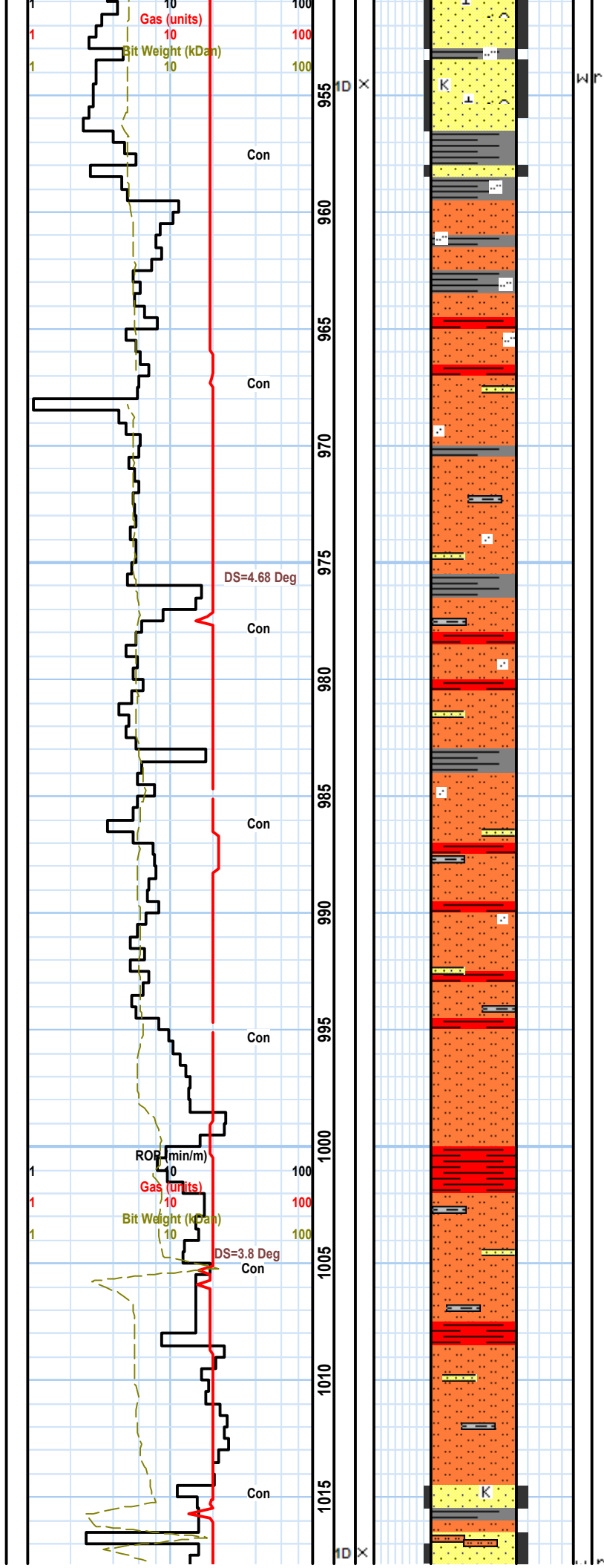
Trip out for bit and motor

910-925 Sandstone: white to light grey white and clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1D, interbeds to stringers of clear fine grained sub rounded well sorted quartz arenite, slightly calcareous, and stringers of greenish grey shale

925-943 Sandstone: white to light grey white and clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1D, interbeds to stringers of clear fine grained sub rounded well sorted quartz arenite, slightly calcareous, and stringers of conglomeratic sandstone

943-947.5 Shale: light greenish grey and reddish brown, sub fissile, waxy, with stringers of sandstone as above

947.5-956.5 Sandstone: white to light grey white and clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded,



moderately well sorted, 6 % porosity, Sneider 1D, interbeds to stringers of clear fine grained sub rounded well sorted quartz arenite, and stringers of conglomeratic sandstone, local shale interbeds

956.5-963.5 Interbedded Grey and Red Shale: grey is light greenish grey, sub fissile, waxy, with stringers of sandstone as above, red is brick red, blocky, and silty throughout

963.5-970 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, grading to silty shale

970-985 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, with interbeds and stringers of grey shale and sandstone as above

985-1000 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, with interbeds and stringers of grey shale and sandstone as above

1000-1014.5 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, with interbeds and stringers of grey shale and sandstone as above

1014.5-1020 Sandstone: white to light grey white and clear, loosely consolidated, kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 % porosity, Sneider 1D, interbeds to stringers of clear fine grained sub rounded well sorted quartz

Sept 28, 2007, 00:00

PDC Bit 2 200 mm  
Reed DSX  
Serial #: 113469  
Out at 1028 m

PDC Bit 3 200 mm  
Smith M616  
Serial #: JW4176  
In at 1028 m

ROP (min/m)  
10  
Gas (units)  
10  
Bit Weight (kDan)  
10

DS=4.01 Deg

DS=4.56 Deg

Con

Con

Con

Con

Con

Con

Con

1020

1025

1030

1035

1040

1045

1050

1055

1060

1065

1070

1075

1080

1085



arenite, slightly calcareous, and stringers siltstone as above

1020-1028 Interbedded Siltstone and Shale: as above, with local sandstone stringers

POOH for bit due to low ROP

1028-1034 Siltstone: Brick red to brown red, micromicaceous, silty throughout, blocky, slightly waxy, with interbeds and stringers of very fine grained sandstone, kaolinitic, calcareous, with thin lenses of conglomeratic sandstone

1034-1042 Siltstone: as above, interbedded with grey shale, silty

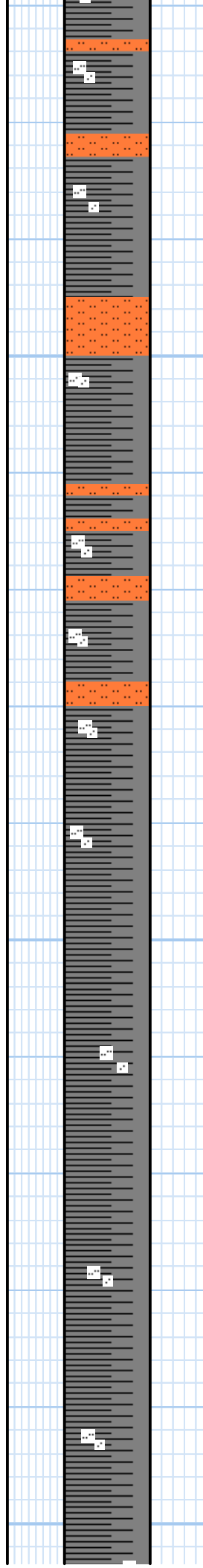
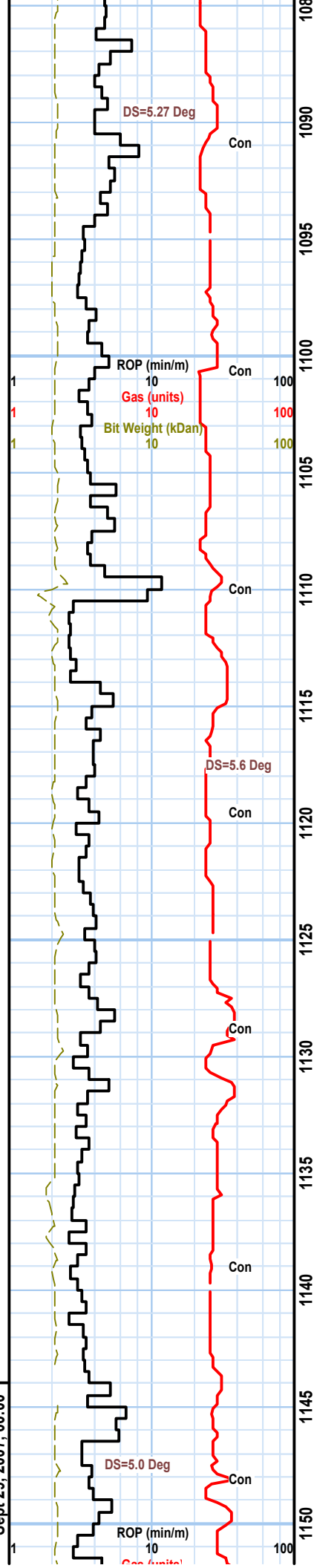
1042-1050 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone

1050-1060 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone as above

1060-1080 Interbedded Siltstone & Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone, brick red to brown red, micromicaceous, silty throughout, blocky

1080-1091.5 Interbedded Siltstone & Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone, brick red to brown red, micromicaceous, silty throughout, blocky

Sept 29, 2007, 00:00



1091.5-1097.5 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone

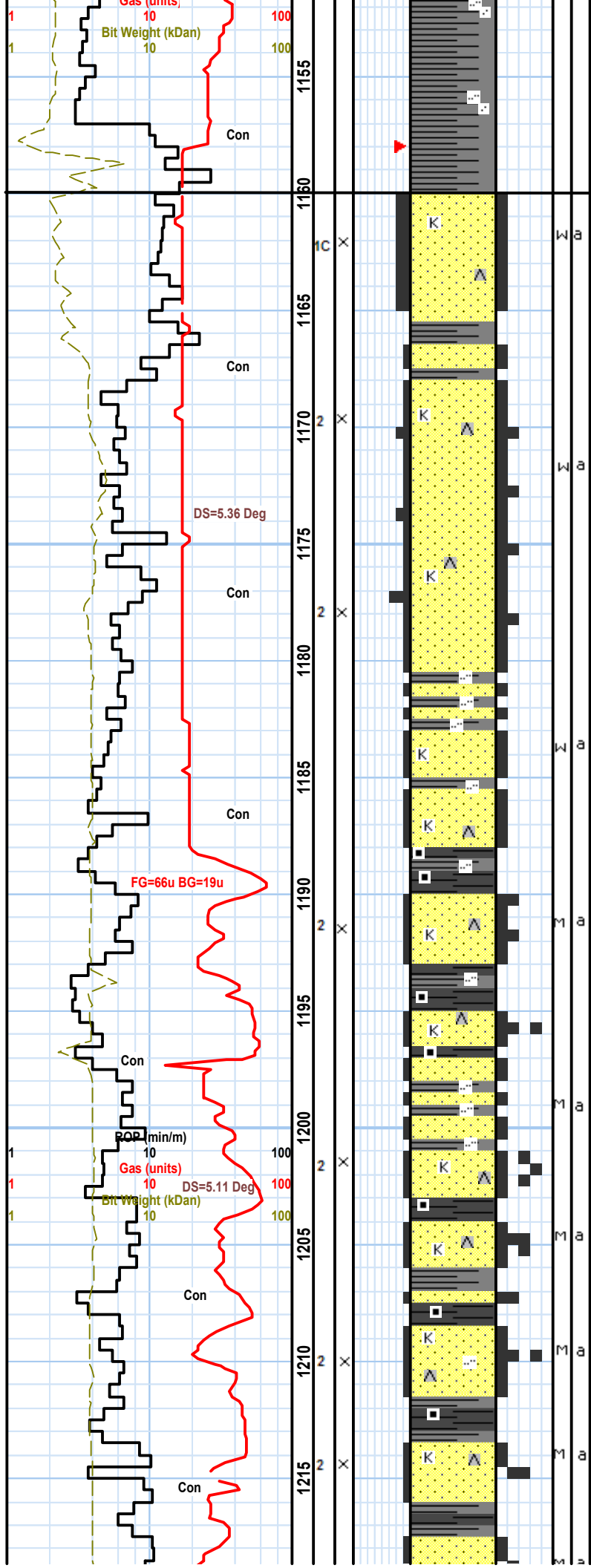
1097.5-1110.5 Interbedded Siltstone & Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone, brick red to brown red, micromicaceous, silty throughout, blocky

1110.5-1115 Interbedded Siltstone & Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone, interbedded with siltstone, brick red to brown red, micromicaceous, silty throughout, blocky

1115-1125 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone

1125-1145 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone

1145-1160 Shale: grey to white grey, silty throughout, blocky to sub fissile, grading regularly to very fine grained sandstone



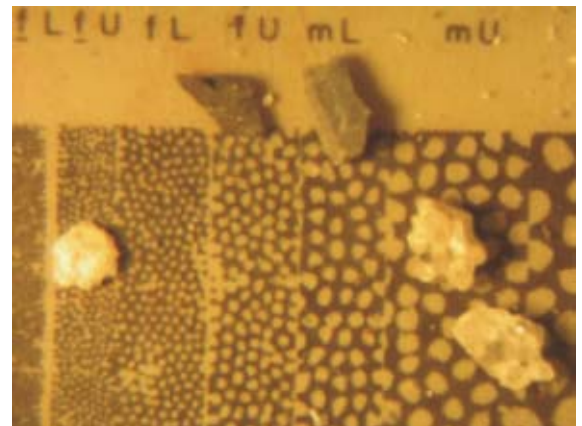
Trip for broken survey cable

## Top Horton Bluff 1160 m MD

1160-1165 Sandstone: white to clear, quartz arenite, very loosely consolidated, trace kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 %porosity, Sneider 1C

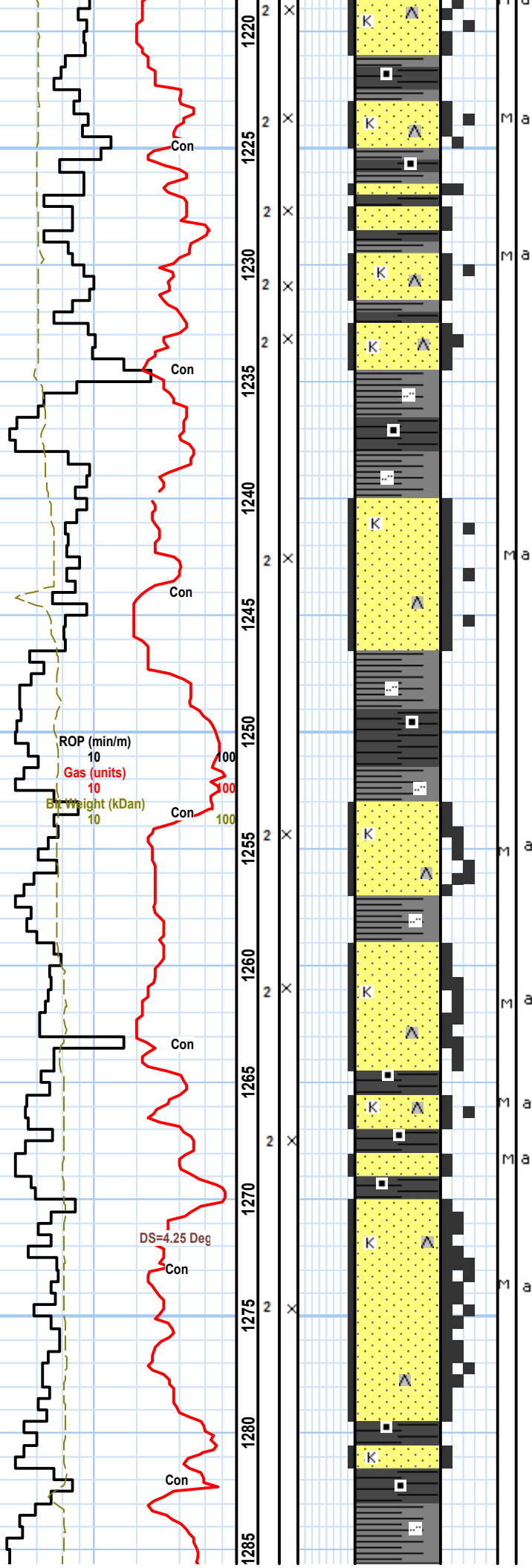
1165-1188 Sandstone: white to clear, quartz arenite, very loosely consolidated, trace kaolinite, fine lower to fine upper, sub rounded, moderately well sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale

1188-1204 Sandstone: white to clear, quartz arenite, very loosely consolidated, trace kaolinite, fine lower to fine upper with some meduim upper, sub rounded, moderately sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous



1204-1215 Sandstone: white to clear, quartz arenite, very loosely consolidated, trace kaolinite, fine lower to fine upper and medium sub angular, moderately well sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

Sept 30, 2007, 00:00



1215-1234.5 Sandstone: white to clear, quartz arenite, very loosely consolidated, kaolinite, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1234.5-1240 Shale: moderate grey to black grey, sub fissile to fissile, silty

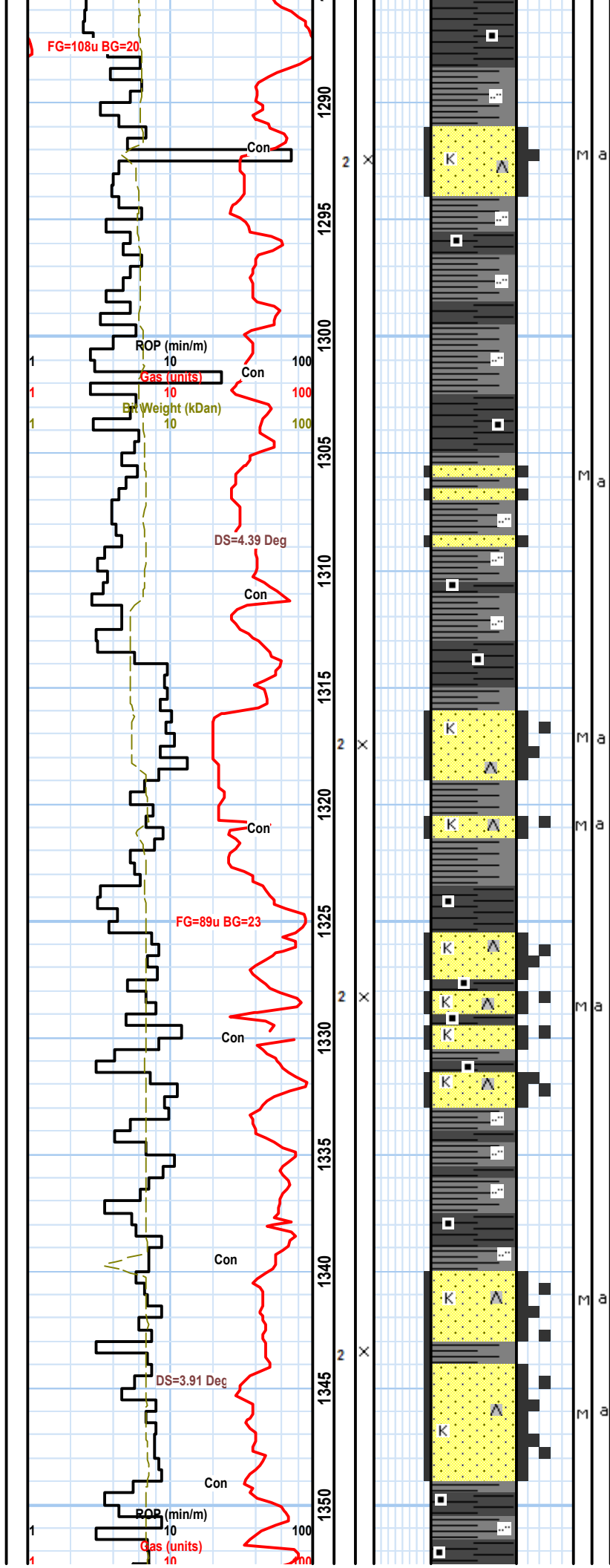
1240-1246.5 Sandstone: white to clear, quartz arenite, very loosely consolidated, kaolinite, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 %porosity, Sneider 2

1246.5-1253 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1253-1279.5 Sandstone: white to clear, quartz arenite, very loosely consolidated, kaolinite, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 %porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1279.5-1291 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shal





1291-1294 Sandstone: as above

1294-1305 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1305-1316 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1316-1333 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

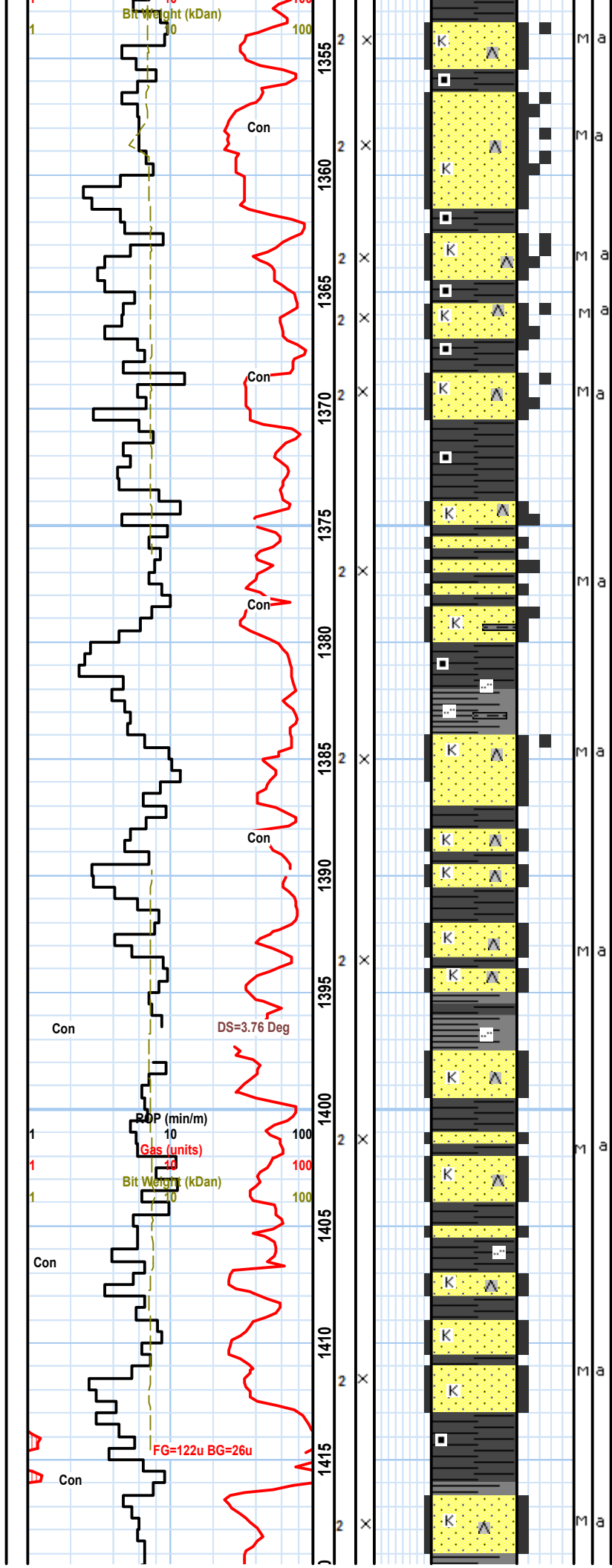


1333-1340 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

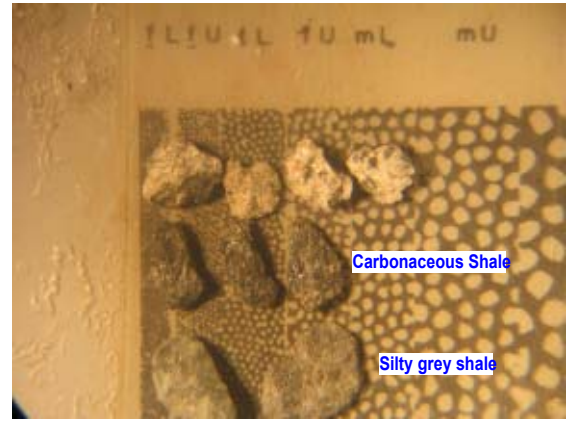
1340-1349 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1349-1353.5 Shale: as above

1353.5-1370.5 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous



1355-1370.5 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous



1370.5-1374 Shale: moderate grey to black grey, sub fissile to fissile, silty, with interbeds of carbonaceous shale

1374-1380 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1380-1384 Shale: as above

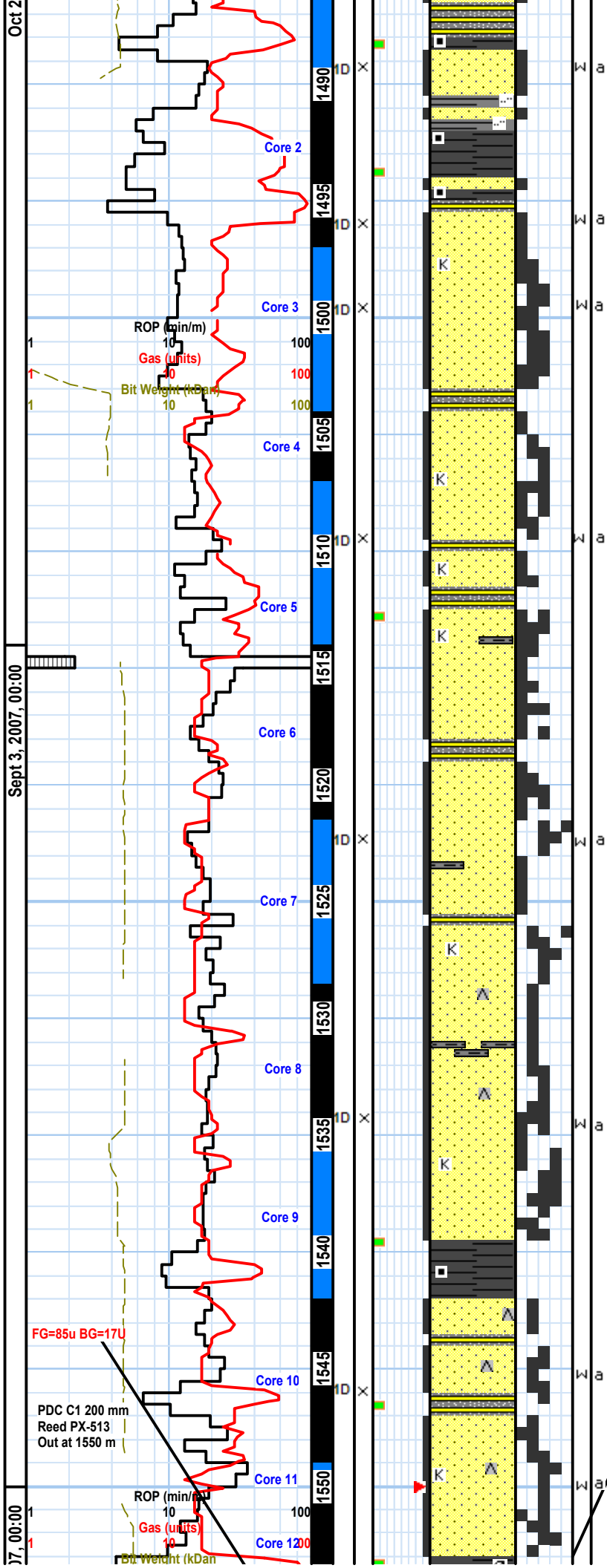
1384-1395 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1395-1410 Sandstone: white, kaolinitic, fine lower to fine upper to medium upper, sub angular, moderately well sorted, 6 % porosity Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous

1410-1440 Sandstone: white, kaolinitic, fine lower to fine upper, sub angular, moderately well sorted, 6 % porosity, Sneider 2, with interbeds locally of grey shale, and stringers to interbeds of dark grey to black fissile shale, carbonaceous







degassing

1488-1488.5 Shale: black carbonaceous

1488.5-1490.5 Sandstone: as above

1490.5-1492 Mixed Sandstone and Dark shale:

1492-1494 Shale: black, carbonaceous, locally silty, fissile to very fissile, local degassing signs

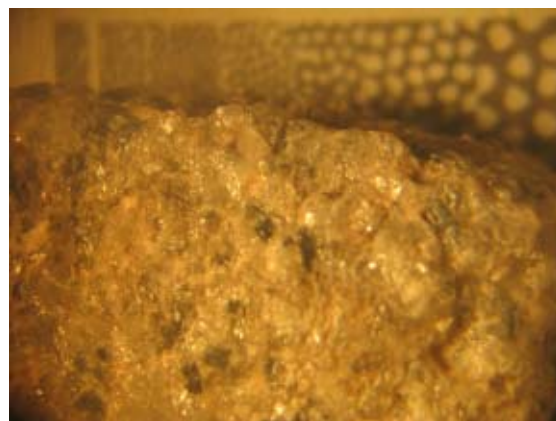
1494-1495.5 Mixed Shale and Sandstone: quartz arenite, white, kaolinitic, fine lower to medium upper, sub angular, well sorted, 6 % porosity, Sneider 2 to 1D, ss is bubbling slightly

1495.5-1503 Sandstone with thin wisps of dark black shale, the shale is degassing

1503-1504 Varved Shale and Sandstone: as above

1504-1512.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium upper, sub angular, well sorted, 6 % porosity, Sneider 2 to 1D, with local stringers to interbeds of black carbonaceous shale

1512.5-1518 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium upper, sub angular, well sorted, 3 % porosity, Sneider 2 to 1D, with local stringers to interbeds of black carbonaceous shale



1518-1540 Sandstone: quartz arenite, white, kaolinitic, fine lower to coarse grained, sub angular, well sorted, 3 % porosity, Sneider 2 to 1D, with local stringers to interbeds of black carbonaceous shale

1540-1542 Shale: black, carbonaceous, locally silty, fissile to very fissile, local degassing signs

1542-1553 Sandstone: quartz arenite, white, kaolinitic, fine lower to coarse grained, sub angular, well sorted, 3 % porosity, Sneider 2 to 1D

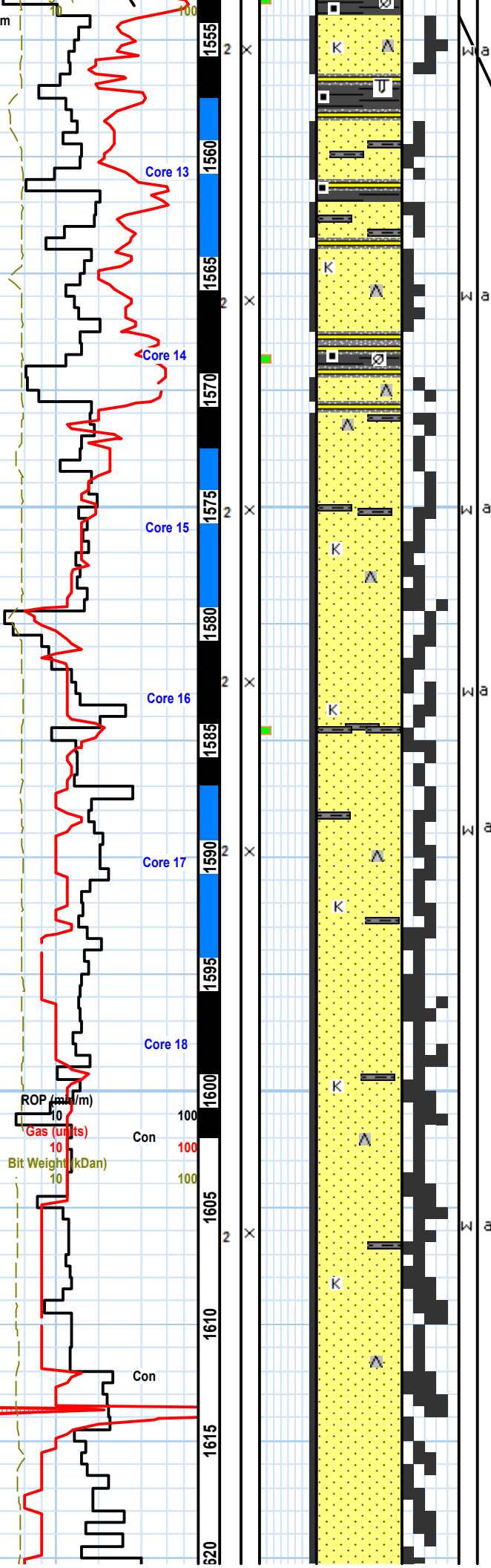


Sept 4, 2007

PDC C2 200 mm  
Reed CSS543  
In at 1550 m

Sept 5, 2007, 00:00

DS=1.54 Deg



1553-1554 Shale: black, carbonaceous, plant fragments, boardering on coal, degassing bubbles

1554-1556.5 Sandstone: as above

1556.5-1558.5 Varved Sandstone and Shale grading to Shale: black, carbonaceous, plant fragments, boardering on coal, degassing bubbles, bioturbated, burrowe

1558.5-1561 Sandstone: quartz arenite, white, kaolinitic, fine lowe to medium grained, sub angular, well sorted, 3 % porosity, Sneider 2 to 1D, with local stringers to interbeds of black carbonaceous shale

1561-1571 Sandstone: as above with interbeds of carbonaceous shale and varved sandstone and shale

1571-1579.5 Sandstone: quartz arenite, white, kaolinitic, fine lowe to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

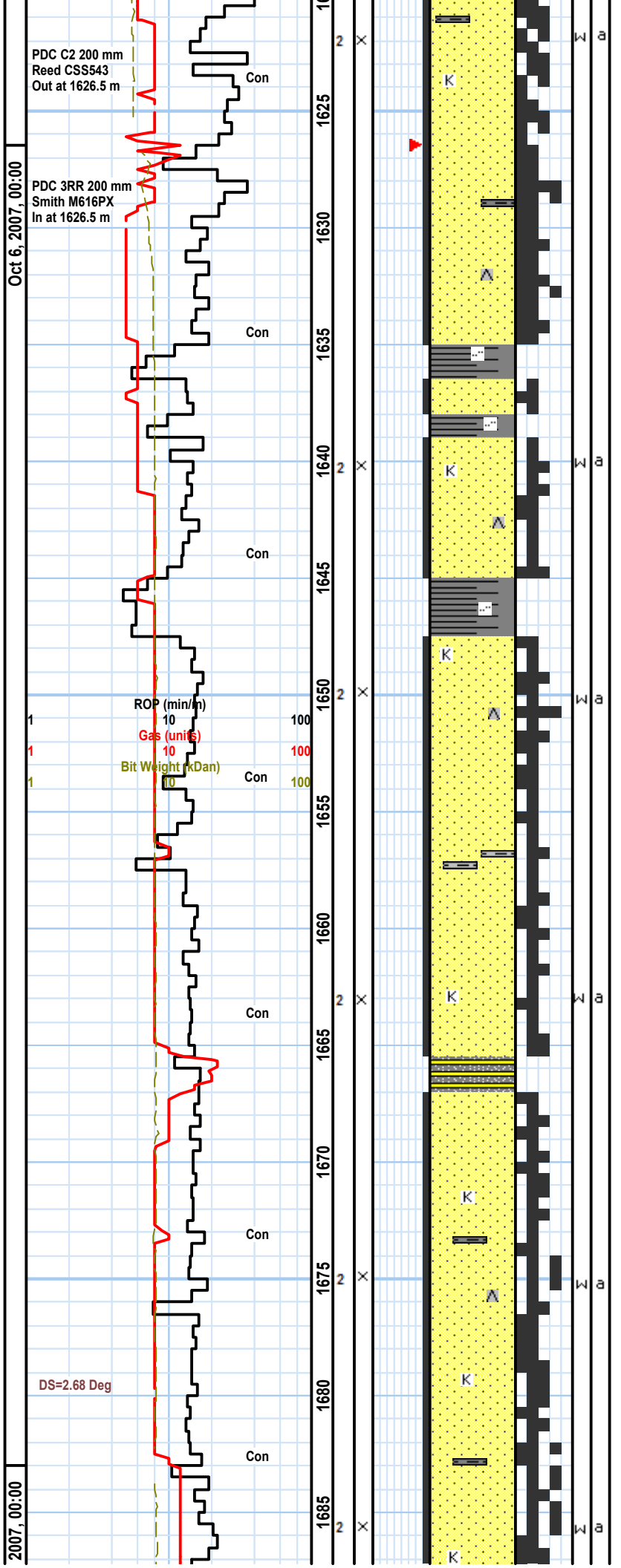
1579.5-1587 Sandstone: quartz arenite, white, kaolinitic, fine lowe to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1587-1594.5 Sandstone: quartz arenite, white, kaolinitic, fine lowe to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

Installed insert to drill full hole with no core

1594.5-1610 Sandstone: quartz arenite, white, kaolinitic, fine lowe to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1610-1625 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale



1625-1635 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1635-1648 Interbedded Sandstone and Shale: sandstone is white kaolinitic, fine lower to medium upper, sub angular, moderately well sorted, 3 % porosity, Sneider 2, with interbeds locally of grey shale

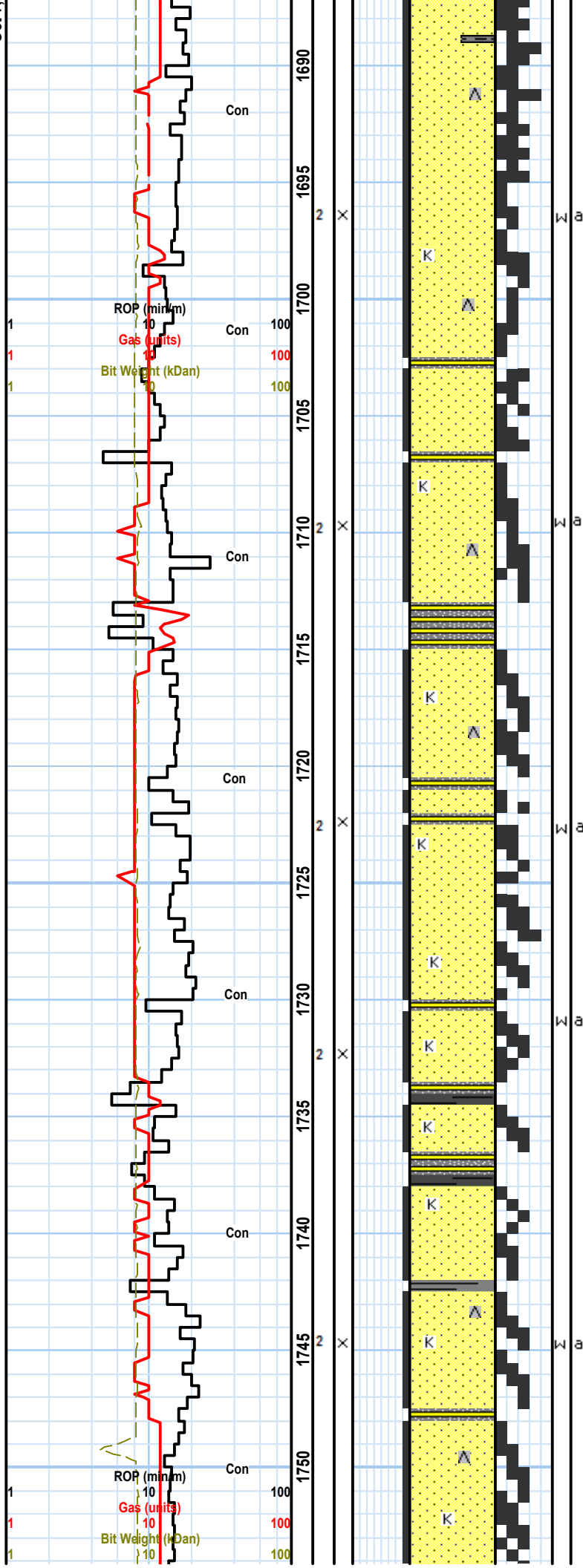
1648-1665.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1665.5-1667 Varved Sandstone and Shale grading to Shale: black

1667-1680 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

1680-1695 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

Oct 7,



1695-1702.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with local stringers of black carbonaceous shale

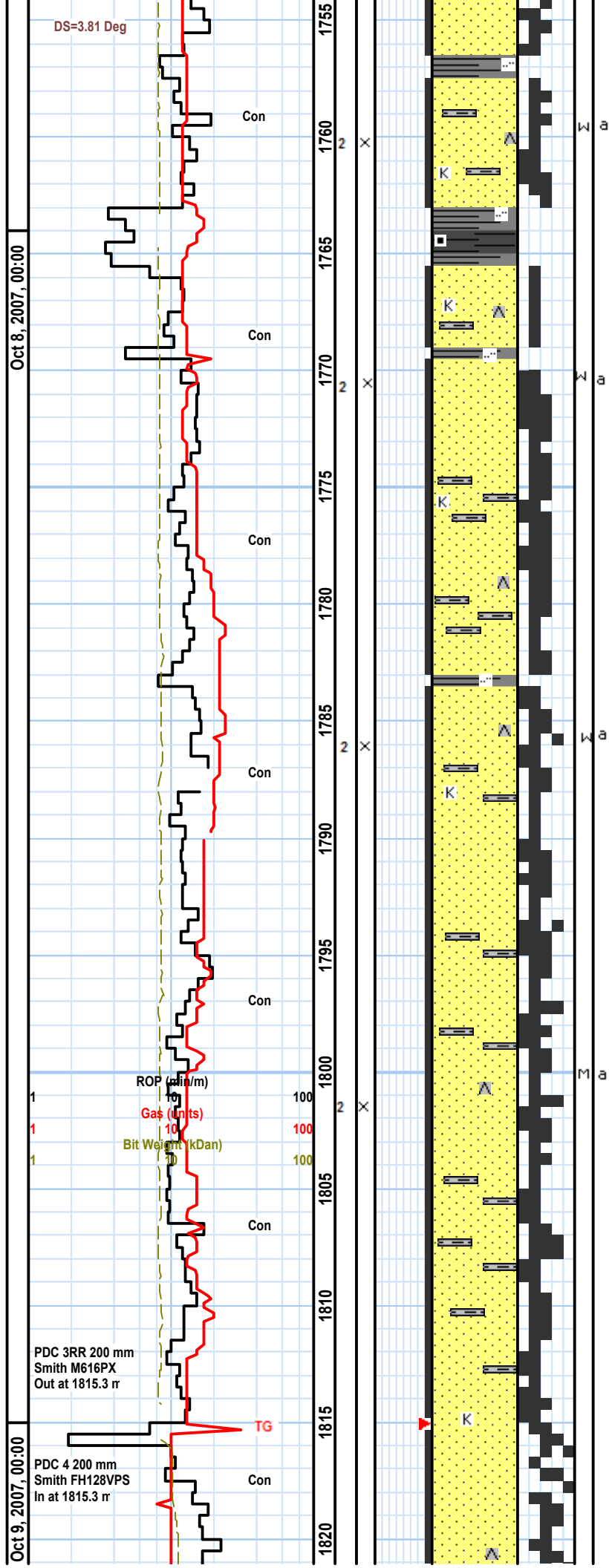
1702.5-1715 Sandstone as above interbedded with and varved with silty carbonaceous shale

1715-1725 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with interbeds of black carbonaceous shale and varved shale and sandstone

1725-1740 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with interbeds of black carbonaceous shale and varved shale and sandstone

1740-1756.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with interbeds of black carbonaceous shale and varved shale and sandstone





**1756.5-1770.5 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with interbeds of black carbonaceous shale and grey silty shale and sandstone**

**1770.5-1790 Sandstone: quartz arenite, white, kaolinitic, fine low to medium grained, sub angular, well sorted, 1 to 3 % porosity, Sneider 2, with stringers to interbeds of black carbonaceous and grey silty shale**

**1790-1800 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, moderately sorted, 1 to 3 % porosity, Sneider 2, with stringers to interbeds of black carbonaceous and grey silty shale**

**1800-1815 Sandstone: quartz arenite, white, kaolinitic, fine lower to medium grained, sub angular, moderately sorted, 1 to 3 % porosity, Sneider 2, with stringers to interbeds of black carbonaceous and grey silty shale**

## Trip to release coring equipment

**1815-1830 Sandstone: quartz arenite, white and clear, kaolinic, fine lower to coarse grained, sub angular, moderately sorted, 1 to 2 % porosity. Spindle 2 with stringers gray silty shal**



