



WCR (VOL. 1)
CONGER-1
W989

ESSO EXPLORATION AND PRODUCTION
AUSTRALIA INC.

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PETROLEUM DIVISION

WELL COMPLETION REPORT

CONGER-1 11 SEP 1989
VOLUME 1
BASIC DATA W989

GIPPSLAND BASIN
VICTORIA

ESSO AUSTRALIA LTD

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MARCH, 1989

CONGER
WELL COMPLETION REPORT
VOLUME 1: BASIC DATA

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1. WELL DATA RECORD

CONGER-1

LOCATION : Latitude : 38⁰21'27.74" South
Longitude : 148⁰03'46.34" East
X = 592862.9 E
Y = 5753956.0 S
Map Projection: UTM Zone 55
Geographical Location: Bass Strait,
Victoria
Field: Conger

PERMIT : Vic/P26

ELEVATION : 21m

WATER DEPTH : 64m

TOTAL DEPTH : 2970m (Driller),2970m (Logger)

PLUG BACK TYPE : Cement Plug

REASONS FOR
PLUGGING BACK : Plug and Abandon

MOVE IN : 24/02/89

SPUDED : 25/02/89

REACHED T.D. : 14/03/89

RIG RELEASED : 19/03/89

OPERATOR : Esso Exploration and Production
Australia Inc.

PERMITTEE OR LICENCEE : BHP Petroleum (Australia) Pty. Ltd.

ESSO INTEREST : 50%

OTHER INTEREST : BHP Petroleum (Australia) Pty. Ltd.: 50%

CONTRACTOR : South Seas Drilling Company

RIG NAME : Southern Cross

EQUIPMENT TYPE : Semi Submersible

TOTAL RIG DAYS : 23.63

DRILLING AFE NO. : 239003

TYPE COMPLETION : Plug and Abandon

WELL CLASSIFICATION : Before Drilling New Field Wildcat
After Drilling Dry Hole

ESSO AUSTRALIA LTD.
CONGER-1 FINAL WELL REPORT
Operations Summary

1. MOVING/MOORING

After bolstering the No. 1 anchor at the Malloway-1 location, the Southern Cross was towed by the MV Lady Caroline to the Conger-1 location. Anchor No. 1 was dropped at Conger-1 at 1530 hours February 24, 1989, thus completing the 28nm tow in 9 hours at an average speed of 3.1 kts.

As the Lady Caroline held the rig on location, the MV's Canning Tide and Eastern Tide ran anchors Nos. 5, 4 and 6. The Lady Caroline was then released from the tow bridle and the Canning Tide ran the remaining anchors. The eight anchors were run and set in 8.75 hours. No downtime was experienced during this operation.

The rig was moved towards the called location and all anchors were load tested to 200 kips. After ballasting down and pretensioning all mooring lines to 70 kips the TGB was run and landed at a seafloor depth of 85m RKB. The rig position was determined to be 10.3m on a bearing of 241° from the called location.

2. DRILLING OPERATIONS

a) 26" Hole/20" Casing

After setting the TGB, the 26" bit/26" hole opener BHA was made up and stabbed into the TGB, thus spudding the Conger-1 well at 1600 hours February 25, 1989. The 26" hole was drilled from 85m to 214m, at an average ROP of 27.2 mph, using seawater and high viscosity gel slugs to clean the hole. After sweeping the hole with 50 bbls of high viscosity mud, 100 bbls of high viscosity mud was spotted, a Totco was dropped and the bit was pulled to the seafloor. The Totco was recovered and the bit was RIH. No drag or fill was encountered, 200 bbls of high viscosity mud was spotted in the hole at TD, then the drillstring was POOH to 115m, where an additional 35 bbls of high viscosity mud was spotted. The drillstring was then POOH to run casing.

Nine joints of 20", 94 ppf, X-56, LS casing, plus a crossover joint (129 ppf, LS x ALT-2) and the 24" pile joint/18³/₄" Vetco SG-5 wellhead assembly were then run, with the 20" shoe at 209m. The casing was cemented to the seafloor, using a drillpipe stinger, with a lead slurry of 750 sx of Class 'G' cement plus 2.2% prehydrated gel and a tail slurry of 350 sx of Class 'G' neat cement.

The BOP stack was run and landed and the shear rams, wellhead connector and casing were tested to 500 psi.

b) 17¹/₂" Hole/13³/₈" Casing

A 17¹/₂" bit and pendulum BHA were then picked up and RIH to the TOC at 204m. The cement and 20" casing shoe were drilled and the 17¹/₂" hole was drilled from 214m to 815m, at an average ROP of 20.0 mph, using a seawater/gel mud system. After dropping a Totco, the drillstring was POOH to log.

When RIH with the BHC/GR/CAL log, the tool would not pass 215m. Two centralizers were added to the bottom of the tool and another unsuccessful attempt was made to RIH. The logging tools were laid down, a bit was picked up and a bridge was reamed at 216-217m. Tight hole was reamed at 286m, then 15m of fill was washed to TD. After sweeping the hole with 100 bbls of high viscosity mud, the drillstring was POOH and the log was successfully run. The caliper log showed a section of hole at about 220m that was washed out to 22+" (i.e., offscale on the caliper track). This section of hole had apparently collapsed and bridged off earlier preventing the logging tools from going down.

The wear bushing was then pulled and 60 joints of 13³/₈", 54.5ppf, K-55, BTC casing, plus the casing hanger pup joint (72 ppf, L-80) were run and landed with the shoe at 798m. The casing was cemented in place with 1000sx of Class 'G' neat cement. The estimated TOC was calculated to be at 298m based on gauge hole diameter. The top plug was bumped and the pressure was increased to 1500psi to test the casing. The 13³/₈" pack-off assembly was successfully energized and tested to 200/2000 psi along with the BOP stack. A Phase I PIT was then run against the shear rams to 1500 psi and the choke manifold was tested to 200/5000 psi.

c) 12¹/₄ Hole

An HP11J bit and pendulum BHA were then RIH. The cement plugs and float collar/float shoe were drilled out and 3m of hole was drilled to 818m, where a Phase II PIT was conducted to 960 psi (16.4 ppg EMW) with no leakoff.

The 12¹/₄" hole was then drilled from 818m to 1822m in one bit run, at an average ROP of 24.7 mph. This bit run set records for the most total footage drilled by one bit (1007m) and the most footage drilled from 2400-2400 hours (674m) for all wells drilled (41) in Bass Strait by the Southern Cross. While drilling this section, the mud system was gradually conditioned and the mud weight was increased to 9.5 ppg. Drilling detergent was also added to the mud system to help control "gumbo" related problems seen on offset wells in the Lakes Entrance formation. Upon POOH 15-50 kips drag was recorded on the first 10 stands out.

Upon RIH with a J11 bit and junk sub tight hole was encountered at 880-910m and 1250-1300m. A bridge was then reamed at 1605-1619m and 4m of fill was washed to TD. (NOTE: The caliper log later showed the interval from the 13³/₈" casing shoe to 1825m to be washed out to a diameter of 14-16", while the hole below 1825m was generally ingauge.) The interval from 1822m to 1928m was then drilled at an average ROP of only 6.6 mph. Because of the low ROP, the bit was POOH after 16 hours and graded T7-B4-I. Lithology in this section graded from the claystone/siltstone formations of the Lakes Entrance to the Top of Latrobe (picked at ±1811m) and the Top of Coarse Clastics (picked at ±1831m or about 26m high to prognosis). While drilling this section operations were suspended twice due to flowline plugging at 1827m and 1850m.

An HP51A bit and the MWD tool were then picked up and RIH. After reaming a bridge at 1904m, the interval from 1928m to 2776m was drilled through sandstone/siltstone formations, in two bit runs, at an average ROP of 10.2 mph. After experiencing a drill break at 2774m-2776m, the bit run was terminated in order to core after observing fluorescence in the cuttings. While drilling this section mud rheological properties began to deteriorate due to an increase in fine solids. Also, while drilling at 2505-2555m, only intermittent data was received from the MWD tool, with total tool failure occurring below 2555m.

A 12¹/₄" core bit and core barrel, with the stabilizers turned down to 12" OD, were then picked up. While dressing the barrel, 6.7m of Mulloway-1 Core No. 2 was discovered in the barrel and successfully recovered. The assembly was RIH to 2640m where tight hole was encountered. After reaming the interval from 2630m to 2712m in 6 hours the core barrel assembly was POOH and changed from 12¹/₄" to 9⁷/₈". The 12¹/₄" core bit was graded as 100% worn on the gauge. A 9⁷/₈" coring assembly was then RIH. While circulating bottoms up prior to coring, the smell of H₂S was noticed at the shale shakers. However, after obtaining negative Draeger tube and Garret Gas Train (GGT) readings, circulation was resumed. Coincident with the smell of H₂S, a sudden drop in mud pH from 10.3 to 9.4 occurred and CO₂ was detected. Therefore, it is possible that the pH drop caused by the presence of CO₂ allowed a low concentration of H₂S to be released from the mud. The interval 2776-2794.5m was then cored at an average ROP of 12.3 mph. Core recovery was 98% and the core bit was graded as 35% worn.

An HP51A bit and new MWD tool were then RIH and the core rat hole was reamed. The interval 2794.5-2970m was then drilled through sandstone/siltstone/ coal formations, at an average ROP of 6.3 mph. It was hoped that the bit would drill to the programmed total depth of 3021m; however, due to high torque, the bit was pulled and found to be 7/16" undergauge. Since all geologic objectives had been met the decision was made to terminate the well at this depth, 51m short of the programmed total depth.

Prior to POOH to run logs, however, 16.75 hours of NPT were required to treat the mud for carbonate contamination which occurred when 415 units of trip gas containing 1.2% CO₂ were recorded after coring. Because of the carbonate contamination, coupled with the high solids content of the mud, poor response to deflocculent treatment was noted, along with high YP's, gels, and fluid loss rates. After diluting as much as possible, lime was added to remove the carbonate, lignosulfonate was used for rheology control and Dextrid/PAC-R were used for filtration control. Prior to POOH, the mud weight was increased to 9.7 ppg to reduce the possibility of having an additional influx of CO₂ and the carbonate concentration was reduced from an original GGT reading of 3000 mg/l to 167 mg/l. No drag was encountered when POOH.

After rigging up Schlumberger, electric logs were run as follows:

Run No. 1 -
DLL/MSFL/LDL/CNL/BHC/SP/GR/CAL
Run No. 2 - SHDT/GR
Run No. 3 - WSS (20 shotpoints)
Run No. 4 - CST/GR (60 cores
shot, 42 recovered)

3. PLUG & ABANDONMENT

After completing final logs, open-ended drillpipe was RIH to 1880m to set a balanced plug across the Top of Latrobe. However, when circulating bottoms up, 900 units of trip gas containing 2.4% CO₂ were recorded. Because the gas units could not be circulated down below 50 units, it was believed that the gas had been swabbed in or was feeding in from below. (NOTE: No RFT's were run to determine formation pressure on this well). Based on log evaluation, no hydrocarbon zones were present in the well to be generating the gas. However, although it was theorized that the gas may have been coming from the very active coals encountered in the well, it was decided to set an abandonment plug across a sand at 2710-2725m, which had originally been picked as gas bearing from the mud log.

Therefore, the pipe was RIH to 2750m. After circulating bottoms up (Gas Units = 20-38-6), a 100m balanced cement plug (P&A Plug No. 1) was set from 2750m to 2650m, using 300sx of Class "G" cement with 0.8% HR6L retarder mixed in freshwater. The pipe was then pulled up to 1880m and a 100m balanced cement plug (P&A Plug No. 2) was set across the Top of Latrobe using 300sx of Class "G" cement with 0.2% HR6L retarder mixed in freshwater. Plug No. 2 was later tagged with 15 kips at 1780m. A 100m balanced cement plug (P&A Plug No. 3) was then set at 848m, across the 13³/₈" casing shoe, using 300sx of Class "G" neat cement mixed in seawater. The plug was pressure tested to 1500 psi and tagged at 755m with 15 kips.

Schlumberger was rigged up and the 13³/₈" casing was cut at 180m using a Pengo explosive cutter. Schlumberger was rigged down, the wearbushing was retrieved and a spear was run. Eight joints of casing and a stub were then pulled and laid down.

Open-ended drillpipe was RIH and a 100m balanced cement plug (P&A Plug No. 4) was set across the 13³/₈" casing stub, from 210m to 110m, using 475sx of Class "G" neat cement mixed in seawater. While laying down drillpipe, Plug No. 4 was pressure tested to 500 psi.

The inner barrel of the slip joint was then pinned closed and the BOP stack and riser were pulled. A mechanical cutter was RIH and the 20" casing was cut at 94m or 1m below the pile joint assembly ALT-2 connector. An 18³/₄" wellhead running tool and bumper sub were then run and the wellhead, PGB, and TGB were retrieved and laid down.

4. PULLING ANCHORS

After the rig was deballasted from drilling draft (48') to transit draft (21'), the MV's Lady Penelope and Lady Diana retrieved the eight anchors in 14 hours. Included in this time was 2 hours of NPT spent untangling 7 of the 8 pendant lines. Under tow by the Lady Penelope, the rig departed for the Blackback-1 well location at 2130 hours March 19, 1989.

3. CASING DATA

CONGER-1

ESSO AUSTRALIA LTD.
CONGER-1 FINAL WELL REPORT
CASING DATA

OD (In.)	WEIGHT (LB/FT)	GRADE	CONNECTION	LENGTH (M)	SHOE DEPTH (M-RKB)	CENTRALIZER POSITION	REMARKS
20	94	X-56	LS	12.44	209	NONE	FLOAT SHOE JOINT
20	94	X-56	LS	92.80		NONE	8 INTERMEDIATE JOINTS
20	129	X-56	LS x ALT-2	11.39		NONE	CROSSOVER JOINT
24	670	—	ALT-2	9.90		NONE	PILE JOINT: VETCO SG-5
				=====			
				126.53			
13-3/8	54.5	K-55	BTC	12.40	798	1 W/ STOP RING	FLOAT SHOE JOINT
	54.5	K-55	BTC	11.95		NONE	FLOAT JOINT
	54.5	K-55	BTC	12.19		1 ACROSS COLLAR	FLOAT COLLAR JOINT
	54.5	K-55	BTC	674.83		1 ACROSS FIRST COLLAR	57 INTERMEDIATE JOINTS
	72	L-80	BTC	3.27		NONE	CASING HANGER PUP JOINT
				=====			
				714.64			-CSG HANGER: SG-5, TYPE T (LOCK RING REMOVED) -PACK-OFF ASSY: SG-5

4. CEMENTING DATACONGER]

ESSO AUSTRALIA LTD. CONGER-1 FINAL WELL REPORT CEMENT DATA								
DATE (1989)	TYPE JOB	INTERVAL (M-RKB)	TYPE CEMENT	VOLUME (SX)	SLURRY WEIGHT (PPG)	ADDITIVES	MIX WATER	REMARKS
26-Feb	20" PRIMARY LEAD		CLASS "G"	750	13.2	2.2% PHG	FW	CEMENT THROUGH DP STINGER. CMT VOLUME AS PER PROGRAM TO PROVIDE 150% EXCESS ABOVE GAUGE HOLE VOLUME W/ TOC @ SEAFLOOR.
26-Feb	20" PRIMARY TAIL	209-85	CLASS "G"	350	15.8	---	SW	
02-Mar	13-3/8" PRIMARY	798-298	CLASS "G"	1000	15.8	---	SW	CMT VOLUME BASED ON GAUGE HOLE DIAMETER. BUMPED PLUG WITH 1500 PSI.
16-Mar	P & A PLUG No.1	2750-2650	CLASS "G"	300	15.8	0.8% HR6L	FW	SET TO COVER SMALL POTENTIAL GAS SAND @ 2710-2725m.
16-Mar	P & A PLUG No.2	1880-1780	CLASS "G"	300	15.8	0.2% HR6L	FW	SET TO COVER THE TOP OF LATROBE PICKED @ 1831m. TAGGED WITH 15 KIPS.
17-Mar	P & A PLUG No.3	848-755	CLASS "G"	300	15.8	---	SW	SET ACROSS 13-3/8" CASING SHOE @ 798m. TESTED TO 1500 PSI, TAGGED WITH 15 KIPS.
17-Mar	P & A PLUG No.4	210-110	CLASS "G"	475	15.8	---	SW	SET ACROSS 13-3/8" CASING STUB @ 180m. TESTED TO 500 PSI.

5. SAMPLES, CONVENTIONAL CORES, SIDEWALL CORES

CONGER-1

<u>INTERVAL (m)</u>	<u>TYPE</u>
815 - 2970	Cutting samples - 3 sets washed and oven dried and 1 set of bagged, air dried cutings. Sampled from 815m - 1750m at 30m intervals. Sampled from 1750m - 2970m at 5m intervals.
815 - 2970	Unwashed composite tinned samples for geochemistry collected at 30m/15m intervals.
2776.0 - 2794.5	Core #1 (Aluminium Sleeved) Cut: 18.5m, Rec: 18.23m (98%)
2943.5 - 1800.0	CST's: Shot 60, Rec 42.

6. WIRELINE LOGS AND SURVEYS

CONGER-1

<u>TYPE AND SCALE</u>		<u>FROM</u>	<u>TO</u>
	<u>SUITE 1</u>		
BHC-CAL-GR	1:200	813.5	81.0
	1:500		
	<u>SUITE 2</u>		
DLL-MSFL-GR-SP-AMS	1:200	2965.5	781.0
	1:500		
BHC-GR-CAL	1:200	2942.0	781.0
	1:500		
LDL-CNL-GR	1:200	2960.0	1740.0
	1:500		
SHDT-GR	1:200	2967.6	1730.5
WSS (CHECKSHOT)	(22 Levels)	2970.0	798.0
GST-GR (SIDEWALL CORES)	(60 Shots)	2943.5	1800.0

7. TEMPERATURE RECORD - CONGER-1

LOGGING RUN	THERMOMETER DEPTH (m)	MAX. RECORDED TEMPERATURE (C°)	CIRCULATION TIME (t _k) (hours)	TIME AFTER CIRCULATION STOPPED (t)	HORNER TEMPERATURE (C°)	GEOHERMAL GRADIENT (C°/km)
<u>Suite 1</u>						
BHC-CAL-GR	798.0	41.5	2H 0M(2.0)	3H 20M(3.33)		
<u>Suite 2</u>						
DLL-MSFL-LDL-CNL-BHC-GR-SP	2934.3	93.5 } 104.0 } 108.0 }	19H 45M(19.75)	9H 11M(9.20) } 15H 40M(15.67) } 20H 25M(20.42) }	132 C°	42.3 C°/km
SHDT-GR	2957.0					
WSS	2965.0					
CST's	No Thermometer Run					

FIGURES

CONGER-1

LOCALITY MAP

Scale 1: 250,000

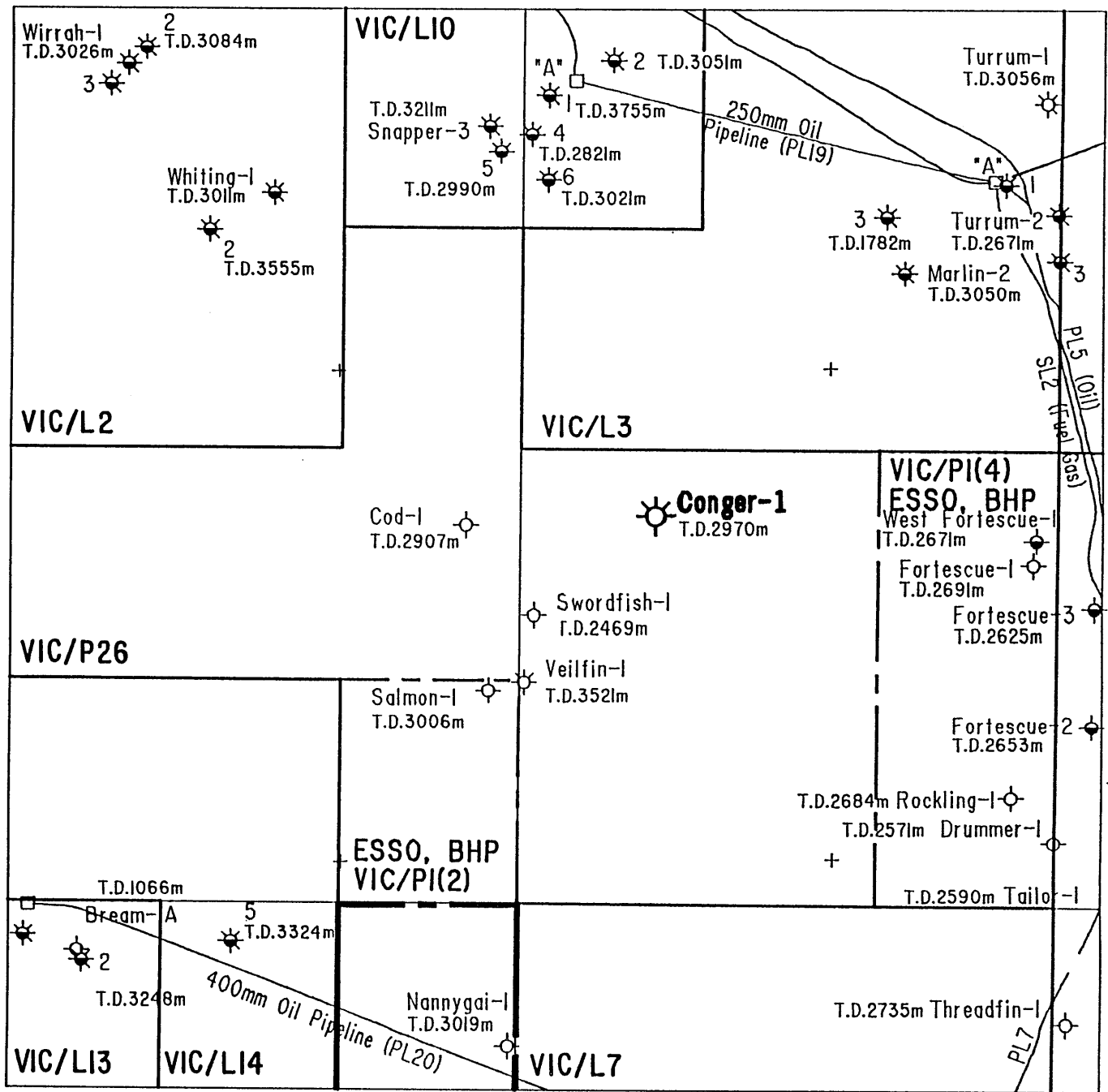


Figure 1

ESSO AUSTRALIA LTD.
PARS WELL PROGRESS CURVE

WELL: **CONGER-1** RIG: **SOUTHERN CROSS**

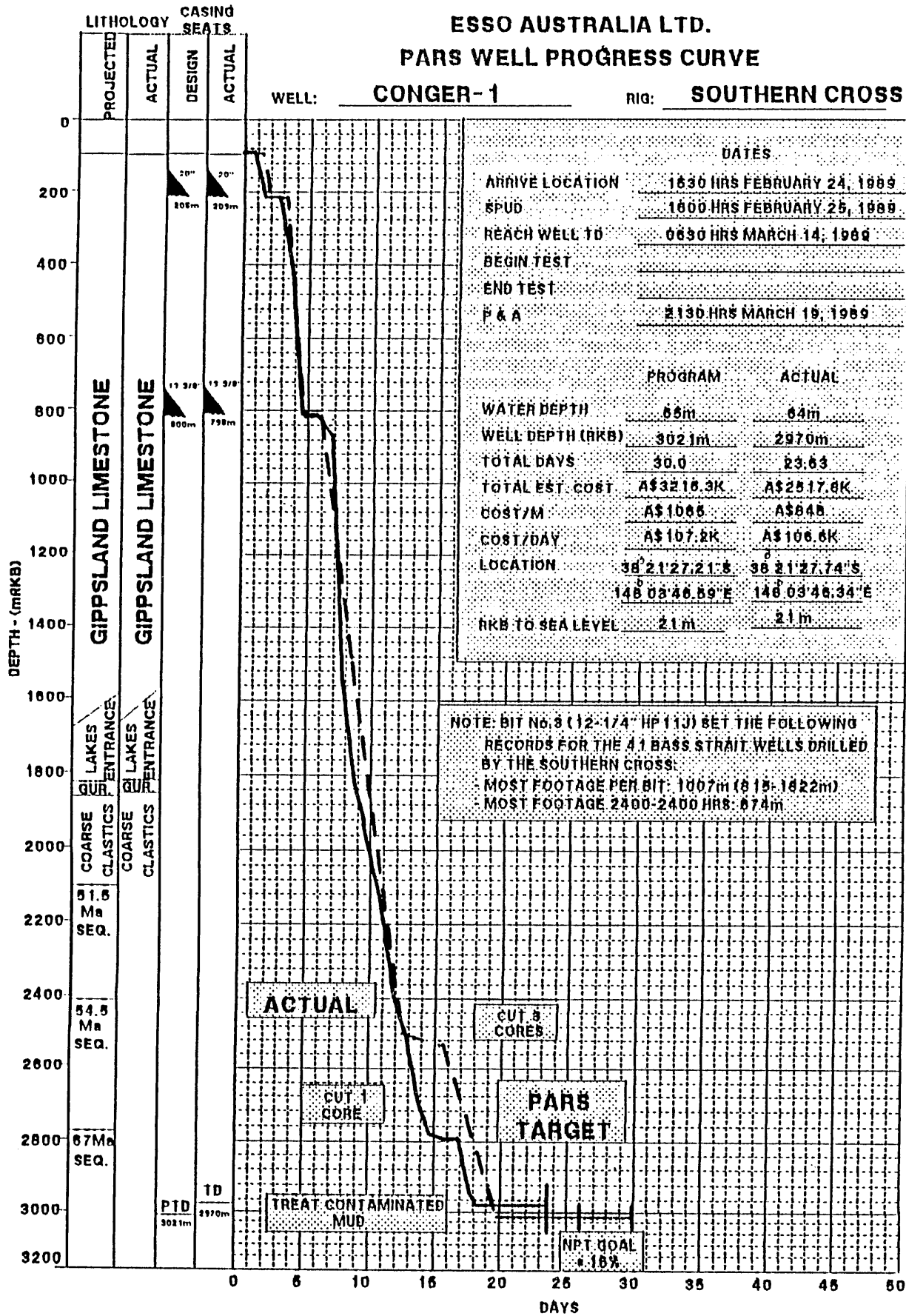


FIGURE 2

ESSO AUSTRALIA LTD. CONGER-1 FINAL WELL REPORT WELLBORE SCHEMATIC

RKB

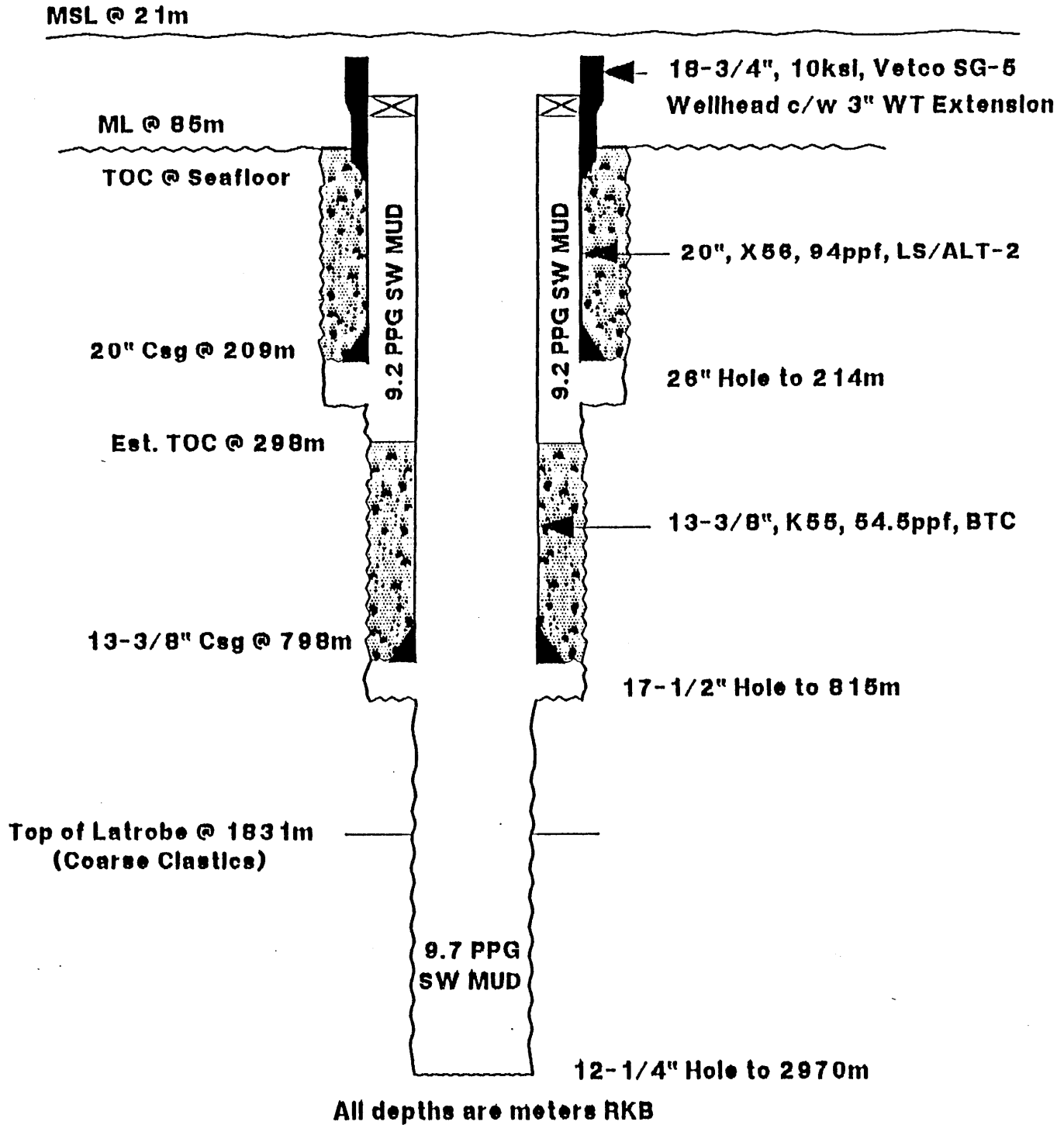
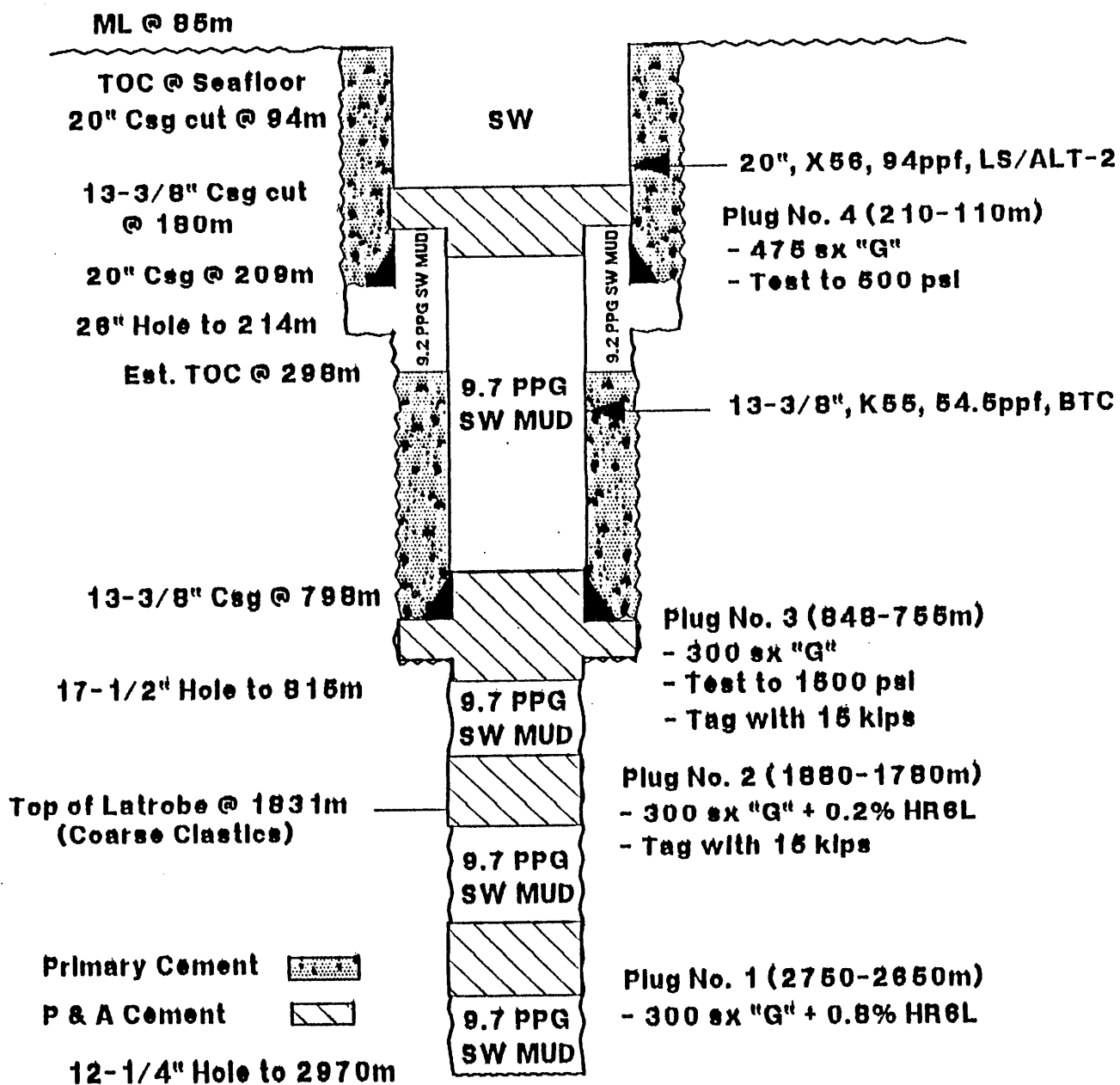


FIGURE 3

ESSO AUSTRALIA LTD. CONGER-1 FINAL WELL REPORT WELLBORE ABANDONMENT SCHEMATIC

RKB

MSL @ 21m



All depths are meters RKB

FIGURE 4

CONGER-1

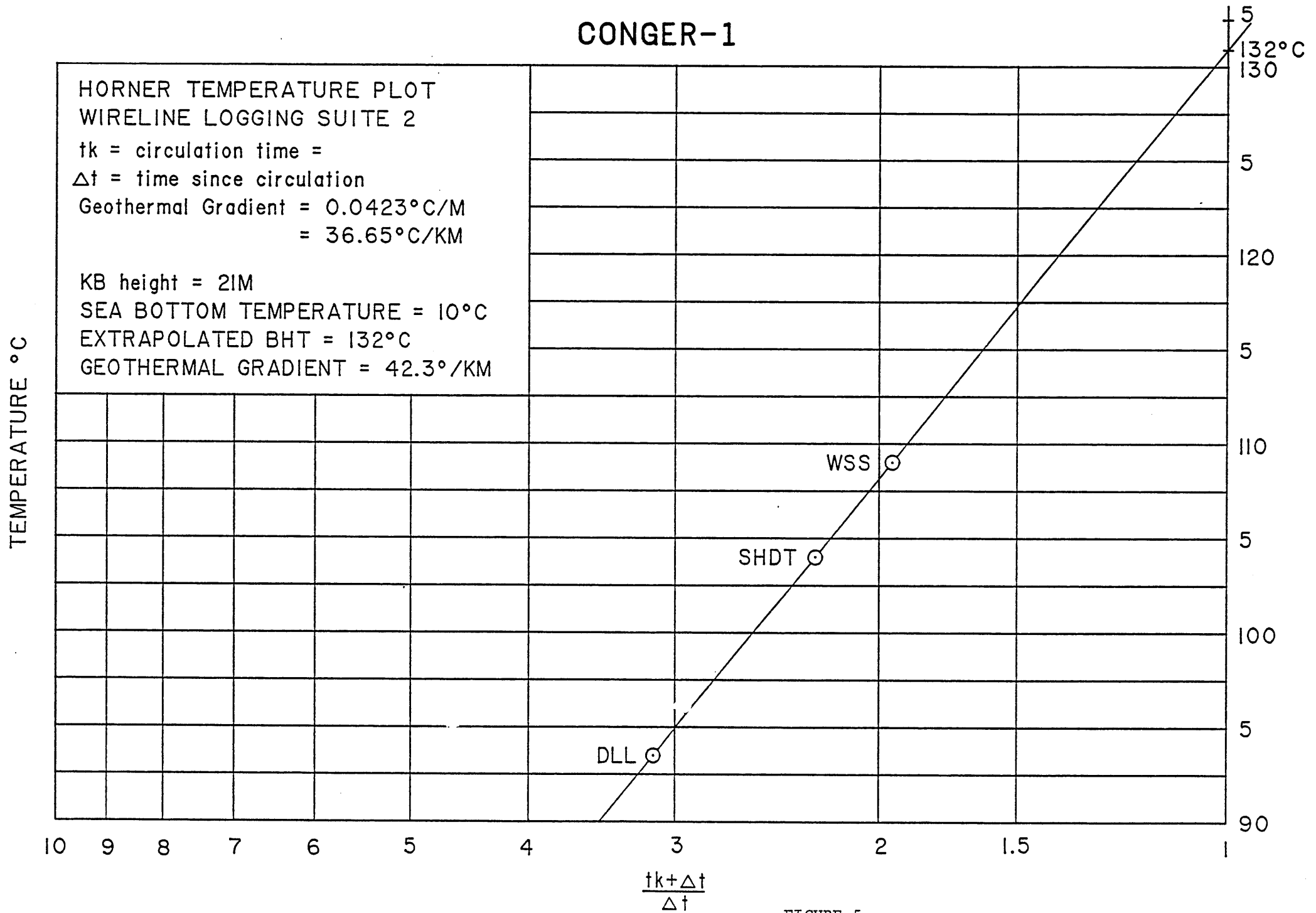


FIGURE 5

APPENDIX 1

CONGER-1

Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
815 - 830	100	<u>LIMESTONE</u> : Light grey, occasionally medium grey, calcilutite grading to calcisiltite (= mudstone), silt size grains of carbonate set in a micritic matrix, very hard, sticky, trace of crystalline carbonate grains.
830 - 860	100	<u>LIMESTONE</u> : Light to medium grey, calcisiltite grading to calcilutite, grains occur in calcite cement, hard, sticky, common forams and trace crystalline grains, trace quartz grains, very poor visual porosity.
860 - 890	100	<u>LIMESTONE</u> : Off white to medium grey, calcilutite to calcisiltite (= mudstone), micritic matrix, common forams, soft to firm.
890 - 920	100	<u>LIMESTONE</u> : As above, trace calcarenite, trace forams, firm.
920 - 950	100	<u>LIMESTONE</u> : As above, trace calcarenite common forams.
950 - 980	100	<u>LIMESTONE</u> : As above, trace to common calcarenite, trace forams.
980 - 1010	100	<u>LIMESTONE</u> : As above, no observable calcarenite, dominantly calcisiltite, common forams.
1010-1040	100	<u>LIMESTONE</u> : As above, trace calcarenite, trace forams, trace claystone.
1040-1070	100	<u>LIMESTONE</u> : As above, no observable calcarenite, common forams, trace calcareous crystalline grains, trace pyrite.
1070-1100	100	<u>LIMESTONE</u> : Medium grey (occasionally light grey), calcilutite to calcisiltite (= mudstone), common forams, sponge spicules, trace pyrite nodules, trace very faint orange mineral fluorescence, (therefore trace dolomite)
1100-1130	100	<u>LIMESTONE</u> : As above, trace forams.
1130-1160	100	<u>LIMESTONE</u> : Predominantly medium grey to occasionally light grey, slightly dolomitic limestone, calcisiltite to calcilutite (= mudstone), rare blocky angular clasts of crystalline carbonate/calcite, common fossil fragments including forams and bryozoans, trace pyrite nodules, trace glauconite, firm to soft.
1160-1190	100	<u>LIMESTONE</u> : Medium grey, predominantly calcilutite as above, grading to very calcareous claystone, cuttings are angular and blocky to occasionally sub fissile, trace carbonaceous flecking.

CONGER-1

Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
1190-1220	100	<u>LIMESTONE</u> : As above composed predominantly of silt sized carbonate grains in a slightly argillaceous and micritic matrix, cuttings are predominantly blocky and angular, minor forams, trace pyrite nodules, rare glauconite and carbonaceous flecks, trace dull yellow orange mineral (dolomitic) fluorescence.
1220-1250	100	<u>LIMESTONE</u> : As above, with abundant forams, moderately argillaceous.
1250-1280	100	<u>LIMESTONE</u> : As above, common forams, minor silt to very fine grained carbonate grains set in a micritic matrix, slightly argillaceous, soft to firm.
1280-1310	100	<u>LIMESTONE</u> : Light to medium grey, slightly dolomitic limestone, calcisiltite grading to calcilutite (= mudstone), composed of very fine to silt sized grains of carbonate set in an argillaceous micritic matrix, common forams, minor pyrite nodules, cuttings are generally blocky, soft to occasionally firm.
1310-1340	100	<u>LIMESTONE</u> : As above, minor fossil fragments including forams, corals, shell fragments, bryozoans, soft to firm cuttings, blocky.
1340-1370	100	<u>LIMESTONE</u> : As above, abundant forams, trace calcarenite, composed of very fine to fine grains of carbonate with trace matrix, moderately hard to hard.
1370-1400	100	<u>LIMESTONE</u> : Light to medium grey, predominantly medium grey, slightly dolomitic, calcisiltite grading to calcilutite (= mudstone), composed predominantly of silt sized carbonate grains, moderately argillaceous in a micritic matrix, trace pyrite nodules, trace fossils including forams (dominant), bryozoans, shell fragments, rare angular clasts of crystalline carbonate/calcite, soft to rarely firm, blocky cuttings, trace dolomite grains giving dull yellow green mineral fluorescence.
	Tr	<u>LIMESTONE</u> : Calcarenite, white to light grey, as above.
1400-1430	100	<u>LIMESTONE</u> : As above, minor fossils (predominantly forams), trace pyrite
1430-1460	100	<u>LIMESTONE</u> : As above, trace forams, trace glauconite, trace calcarenite.

CONGER-1

Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
1460-1490	100	<u>LIMESTONE</u> : As above, trace forams, trace glauconite, trace calcarenite, trace very pale brown calcisiltite.
1490-1520	100	<u>LIMESTONE</u> : Medium grey (trace very pale brown), limestone and trace dolomite, calcisiltite (= mudstone), silt sized carbonaceous and argillaceous grains, micritic matrix and calcareous cement, trace forams, trace glauconite, trace of yellow to green dolomitic mineral fluorescence.
1520-1550	100	<u>LIMESTONE</u> : As above, trace forams, bryozoans, trace to very minor calcarenite, trace pyrite.
	Tr	<u>CLAYSTONE</u> : Light brown to grey, argillaceous matrix and calcareous cement, firm, blocky.
1550-1580	100	<u>LIMESTONE</u> : Medium grey (occasionally light brown grey), limestone, calcisiltite (minor calcilutite) (= mudstone), silt sized carbonaceous and argillaceous grains with trace pyrite, trace forams and rare glauconite, soft to firm (firm being more commonly associated with brown grey fragments), blocky.
1580-1610	100	<u>LIMESTONE</u> : As above, common forams and bryozoans, trace pyrite.
	Tr	<u>CLAYSTONE</u> : Off white to pale grey, predominantly argillaceous matrix, strong swelling clay, trace pyrite, very soft, fissile.
1610-1640	95	<u>LIMESTONE</u> : As above, trace forams, no glauconite, no pyrite.
	5	<u>CLAYSTONE</u> : As above, trace quartz grains in matrix.
1640-1670	90	<u>LIMESTONE</u> : As above, trace forams, trace to common glauconite, trace pyrite.
	10	<u>CLAYSTONE</u> : As above, common quartz grains in matrix, strongly swelling clay, soft, slightly sticky.
1670-1700	100	<u>LIMESTONE</u> : As above, predominantly light brown grey in colour, limestone, calcisiltite (= mudstone), silt sized carbonate and argillaceous grains, trace forams, soft to firm, blocky.
1700-1730	95	<u>LIMESTONE</u> : As above, light brown grey to light grey, slightly dolomitic, calcisiltite (= mudstone).
	5	<u>CLAYSTONE</u> : As above.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
1730-1750	100	<u>LIMESTONE</u> : Light brown grey to light grey, trace very light green grey, slightly dolomitic, calcisiltite (= mudstone), becoming very argillaceous and composed predominantly of silt sized carbonate grains set in a micritic matrix, grades to very calcareous siltstone as carbonate content decreases, very slightly arenaceous in part, with rare fine to medium grains of crystalline carbonate/calcite, minor forams, trace pyrite nodules and glauconite, cuttings are blocky and angular, soft to firm (calcisiltite grading to calcsiltstone).
	Tr	<u>LIMESTONE</u> : Off white to light grey brown, calcarenite (grainstone), composed predominantly of fine to occasionally medium sized grains of carbonate and minor fossil fragments, with a weak calcareous cement, trace argillaceous matrix, firm to moderately hard grain aggregates.
1750-1755	90	<u>LIMESTONE</u> : Light brown grey as above, calcisiltite grading to very calcareous siltstone.
	10	<u>CLAYSTONE</u> : White to off white and light grey, very slightly arenaceous, uniform texture and appearance, soft, slightly sticky, soluble and dispersive, washing out of sample.
1755-1760	90	<u>LIMESTONE</u> : As above.
	10	<u>CLAYSTONE</u> : As above.
1760-1765	90	<u>LIMESTONE</u> : Light grey brown calcisiltite as above.
	10	<u>CLAYSTONE</u> : As above.
1765-1770	90	<u>LIMESTONE</u> : As above, trace pyrite nodules, minor fossils predominantly forams.
	10	<u>CLAYSTONE</u> : As above.
1770-1775	95	<u>LIMESTONE</u> : Calcisiltite as above.
	5	<u>CLAYSTONE</u> : As above.
1775-1780	90	<u>LIMESTONE</u> : Light grey to light grey brown, rare medium grey slightly dolomitic, predominantly calcisiltite grading in part to calcilutite (= mudstone), becoming slightly arenaceous with very fine to fine grains of carbonate, very argillaceous and grading to calcareous siltstone/claystone, very slightly pyritic and glauconitic, trace forams, firm to soft, blocky cuttings.
	10	<u>CLAYSTONE</u> : Light grey to off white, as above, very soft and dispersive.
1780-1785	95	<u>LIMESTONE</u> : As above.
	5	<u>CLAYSTONE</u> : As above.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
1785-1790	100 Tr	<u>LIMESTONE</u> : Calcisiltite as above. <u>CLAYSTONE</u> : As above.
1790-1795	90 10	<u>LIMESTONE</u> : As above calcisiltite grading to very calcareous siltstone, minor forams, trace bryozoans, very argillaceous (abundant clay and silt residue from acid), trace pyrite <u>CLAYSTONE</u> : Light grey to off white, slightly silty and arenaceous in part, generally smooth homogeneous texture, moderately calcareous, very soft and slightly sticky, dispersive.
1795-1800	90 10	<u>LIMESTONE</u> : As above becoming slightly darker grey, intergradational between limestone (calcisiltite/calculutite) and a very calcareous siltstone. <u>CLAYSTONE</u> : As above.
1800-1805	95 5	<u>LIMESTONE</u> : As above, predominantly medium grey, occasionally light grey and brown. <u>CLAYSTONE</u> : As above.
1805-1810	95 5	<u>LIMESTONE</u> : As above with minor glauconite (1-2%), fine to medium grained. <u>CLAYSTONE</u> : As above.
1810-1815	90 10	<u>LIMESTONE</u> : Light grey to occasionally medium grey and light grey brown, slightly dolomitic, calcisiltite grading to calcarenite (= mudstone to wackstone), becoming moderately arenaceous and composed of silt to very fine and medium grained carbonate grains with minor fossil fragments, common forams, minor glauconite, trace black reworked and rounded coal fragments, set in an argillaceous micritic matrix, trace pyrite (<1%), trace medium brown rounded pellets. <u>CLAYSTONE</u> : As above.
1815-1820	90 10	<u>LIMESTONE</u> : As above. <u>CLAYSTONE</u> : As above.
1820-1825	100 Tr	<u>LIMESTONE</u> : As above, trace fossils (forams), trace pyrite, trace (1-2%) glauconite. <u>CLAYSTONE</u> : As above.
1825-1830	100 Tr	<u>LIMESTONE</u> : As above, calcisiltite, common glauconite (up to 5%). <u>CLAYSTONE</u> : As above.
1830-1835	95	<u>SILTSTONE</u> : Medium grey, dominantly argillaceous with high calcareous content (comparable and gradational with description above), argillaceous matrix and some calcareous cement, abundant glauconite (up to 5%), firm, blocky.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
1830-1835 (contd)	5	<u>SANDSTONE</u> : White to translucent, loose and clean, medium to coarse grained, moderately sorted, subrounded to rounded, loose grains, excellent inferred porosity, no observed fluorescence.
1835-1840	60	<u>SILTSTONE</u> : As above, common to abundant glauconite (10%).
	40	<u>SANDSTONE</u> : As above, medium to very coarse grained, poorly sorted, subrounded-rounded, loose grains, trace Iron oxide coated (yellow to orange) grains, excellent inferred porosity, (beach sand), no fluorescence.
1840-1845	90	<u>SANDSTONE</u> : As above, subrounded-rounded, common oxide staining (yellow to orange).
	10	<u>SILTSTONE</u> : As above, common glauconite.
1845-1850	90	<u>SANDSTONE</u> : As above, coarse to very coarse grained, moderately sorted, subrounded to rounded, loose and clean, abundant oxide stained grains.
	10	<u>SILTSTONE</u> : As above, trace glauconite (?cavings).
1850-1855	90	<u>SANDSTONE</u> : As above, trace pyrite and quartz aggregates, trace of iron stained grains.
	10	<u>SILTSTONE</u> : As above, no glauconite.
1855-1860	95	<u>SANDSTONE</u> : White to off white, loose and clean, fine to very coarse grained, very poorly sorted, subangular, trace pyrite cementing, loose, excellent inferred porosity, trace mineral fluorescence.
	5	<u>COAL</u> : Black to dark brown, silty, waxy to dull, blocky to subconchoidal, hard.
1860-1865	60	<u>COAL</u> : Dark brown to black, slightly silty, dull, trace fine quartz grains and argillaceous matrix, blocky, subconchoidal, hard.
	40	<u>SANDSTONE</u> : White to off white, loose and clean, medium to very coarse grained, poorly sorted, subangular, weak to moderate siliceous cement, trace pyrite and associated aggregates of quartz grains, very good inferred porosity, no fluorescence.
1865-1870	60	<u>SANDSTONE</u> : As above, fine to coarse grained, trace pyrite, no fluorescence.
	30	<u>COAL</u> : As above.
	10	<u>SILTSTONE</u> : Pale brown, argillaceous to trace arenaceous, argillaceous matrix, carbonaceous detritus, blocky, firm to moderately hard,

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
1870-1875	100	<u>SANDSTONE</u> : Clear to translucent, medium to coarse grained, occasionally very coarse angular bit fracture shards and grains, poorly sorted, subrounded to occasionally rounded, generally loose with no cement or matrix, occasional grains with quartz overgrowths indicating a weak to moderate siliceous cement, loose, minor black to dark brown staining on grains (bitumen?), very good inferred porosity, no fluorescence.
	Tr	<u>COAL</u> : As above.
1875-1880	100	<u>SANDSTONE</u> : White to translucent, medium to very coarse grained, very poorly sorted, subangular to subrounded, loose and clean, no cement or matrix, weak siliceous cement, trace brown staining and trace pyrite, excellent inferred porosity, no fluorescence.
	Tr	<u>COAL</u> : As above.
1880-1885	100	<u>SANDSTONE</u> : As above, trace to common pyrite, weak to moderate siliceous cement, no fluorescence.
	Tr	<u>COAL</u> : As above.
1885-1890	100	<u>SANDSTONE</u> : Clear to occasionally translucent and milky white, medium to coarse grained, occasionally very coarse, poor to moderately sorted, generally rounded to occasionally very well rounded, no visible cement or matrix, grains are loose and clean, minor quartz overgrowth surfaces noted on some grains, very good to excellent inferred porosity, no fluorescence.
1890-1895	60	<u>SANDSTONE</u> : As above, becoming poorly sorted, subangular to subrounded, common bit fracture grains, good inferred porosity, no fluorescence.
	40	<u>SILTSTONE</u> : Light grey to tan, occasionally medium brown, moderately argillaceous, slightly arenaceous, very calcareous in part, trace microcarbonaceous flecks, micromicaceous, firm to moderately hard, subfissile to blocky, occasionally fissile.
1895-1900	100	<u>SANDSTONE</u> : Clear to translucent, medium to coarse grained, very coarse angular fragments in part, poorly sorted, subangular to subrounded, as above, becoming clean and loose with trace pyrite cement, excellent to very good inferred porosity, no fluorescence.
1900-1905	100	<u>SANDSTONE</u> : Generally as above, becoming finer grained, predominantly medium grained, occasionally grading from fine to coarse grained, no cement or matrix, very clean, loose, very good inferred porosity, no fluorescence.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
1900-1905 (contd)	Tr	<u>SILTSTONE</u> : As above
1905-1910	100	<u>SANDSTONE</u> : Clear to translucent, medium to coarse, occasionally fine grained, as above, very clean, very good to excellent inferred porosity, no fluorescence.
1910-1915	100	<u>SANDSTONE</u> : As above, good inferred porosity, no fluorescence.
	Tr	<u>SILTSTONE</u> : As above.
1915-1920	100	<u>SANDSTONE</u> : Clear to translucent, clean and loose, fine to very coarse grained, very poorly sorted, subrounded to rounded, trace siliceous cement, trace pyrite, excellent inferred porosity, no fluorescence.
	Tr	<u>SILTSTONE</u> : As above.
1920-1925	90	<u>SANDSTONE</u> : As above, trace siliceous cement, trace pyrite cemented quartz aggregates, no fluorescence.
	10	<u>SILTSTONE</u> : As above, very calcareous, trace dolomitic mineral fluorescence.
1925-1930	100	<u>CAVINGS</u> : Bit trip produced cavings (Siltstone, Sandstone, Coal)
1930-1935	90	<u>SANDSTONE</u> : As above, trace siliceous cement, trace iron oxide staining on grains, very good inferred porosity, no fluorescence.
	10	<u>SILTSTONE/COAL</u> : As above, trace dolomite (mineral fluorescence), (cavings?).
1935-1940	60	<u>SANDSTONE</u> : Translucent to clear, medium to very coarse grained, very poorly sorted, grains appear shattered and angular, weak siliceous cement, no visible matrix, loose grain fragments, fair to good inferred porosity, no fluorescence.
	20	<u>SILTSTONE</u> : Light grey to tan, medium brown, grading to very dark mottled brown black, moderate to very argillaceous, moderately calcareous (light grey siltstone only), moderate to very carbonaceous with common flecks, abundant micromicaceous flakes, firm, blocky.
	20	<u>COAL</u> : Very dark brown to black, generally dull, very silty, uneven fracture, rare subconchoidal fracture, brittle, moderately hard to hard.
1940-1945	60	<u>SANDSTONE</u> : As above, trace iron oxide stained grains, trace pyrite cemented quartz aggregates, no fluorescence.
	40	<u>SILTSTONE/COAL</u> : As above, quite mixed and probably cavings, trace dolomite, (mineral fluorescence)

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
1945-1950		No sample collected. Sample washed off shakers.
1950-1955	100	<u>SANDSTONE</u> : White to translucent, loose and clean, medium to very coarse grained, poorly sorted, subangular to subrounded, weak siliceous cement, trace pyrite cemented quartz aggregates, excellent inferred porosity, no fluorescence.
	Tr	<u>SILTSTONE</u> : Medium grey, dominantly argillaceous and minor calcareous, calcareous cement, trace carbonaceous detritus, firm, subfissile to blocky.
	Tr	<u>COAL</u> : Dominantly black, slightly silty, waxy to dull, blocky to conchoidal, hard.
1955-1960	70	<u>SANDSTONE</u> : As above, trace pyrite, excellent inferred porosity, no fluorescence.
	20	<u>SILTSTONE</u> : Medium brown, argillaceous, trace fine arenaceous detritus, trace carbonaceous material, firm, blocky.
	10	<u>COAL</u> : As above, trace silty laminae and interfingering.
1960-1965	90	<u>SANDSTONE</u> : As above, coarse to very coarse grained, trace pyrite, excellent inferred porosity, no fluorescence.
	10	<u>COAL</u> : As above, common interlaminae of siltstone and fragments, hard.
1965-1970	95	<u>SANDSTONE</u> : As above, trace siliceous cement, trace pyrite, excellent inferred porosity, no fluorescence.
	5	<u>SILTSTONE</u> : Medium grey, dominantly argillaceous and minor calcite, calcareous cement, trace carbonaceous detritus, firm, subfissile to blocky.
	Tr	<u>COAL</u> : As above, fine silty interlaminae.
1970-1975	100	<u>SANDSTONE</u> : As above, trace pyrite, (crystalline, some cubes), excellent inferred porosity, trace yellow green fluorescence, very weak cut, medium yellow film residue.
	Tr	<u>COAL</u> : As above.
1975-1980	100	<u>SANDSTONE</u> : Translucent to clear, medium to very coarse, predominantly medium grained, poorly sorted, medium to coarse grains are subrounded to subangular, very coarse grains are fractured and angular, minor weak siliceous cement inferred, clean with no matrix, generally loose, very good inferred porosity, no fluorescence.
1980-1985	100	<u>SANDSTONE</u> : as above, slightly finer grained, predominantly medium, grading coarse to very coarse occasionally, trace mica, no fluorescence.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
1980-1985 (contd)	Tr	<u>COAL</u> : Black to dark brown, very silty and grades to carbonate siltstone, as above.
1985-1990	100	<u>SANDSTONE</u> : Translucent to clear, with common milky white coarse quartz grains, medium to very coarse grained, very poorly sorted, subangular, inferred weak siliceous cement, loose, clean, good to very good inferred porosity, no fluorescence.
	Tr	<u>SILTSTONE</u> : Light to medium grey, argillaceous, moderately calcareous, firm, blocky, (possibly cavings).
1990-1995	100	<u>SANDSTONE</u> : As above.
	Tr	<u>SILTSTONE</u> : As above, also medium to dark brown, moderately argillaceous, common carbonaceous specks and microlaminae, micromicaceous, non calcareous, firm, blocky to subfissile.
1995-2000	60	<u>SANDSTONE</u> : As above.
	40	<u>SILTSTONE/COAL</u> : Medium brown to dark brown, brown black, moderately argillaceous, very carbonaceous with common to abundant coal and carbonaceous fragments and laminae, siltstone grades to very silty dull coal, moderately micromicaceous, hard to moderately hard, fissile to subfissile, siltstone gives moderately bright green yellow crush cut.
2000-2005	80	<u>SILTSTONE</u> : As above.
	20	<u>SANDSTONE</u> : As above.
	Tr	<u>COAL</u> : Black to very dark brown, very silty, dull to subvitreous lustre, brittle, hard.
2005-2010	95	<u>SILTSTONE</u> : As above, medium to dark brown, abundant carbonaceous detritus, coal laminae, blocky, hard, moderately bright green yellow slow cut fluorescence.
	5	<u>SANDSTONE</u> : As above, trace to common pyrite quartz aggregates, good inferred porosity, no fluorescence.
2010-2015	70	<u>SANDSTONE</u> : White to translucent, loose and clean, medium grained, moderately well sorted, subrounded, trace siliceous cement, trace pyrite, very good inferred porosity, no fluorescence.
	30	<u>SILTSTONE</u> : As above, moderate to high carbonaceous content.
2015-2020	100	<u>SANDSTONE</u> : As above, medium to very coarse grained, poorly sorted, loose and clean, excellent inferred porosity, no fluorescence.
	Tr	<u>SILTSTONE</u> : As above.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2020-2025	50	<u>SANDSTONE</u> : As above.
	50	<u>COAL</u> : Black, very dark brown, dull, silty, common pyrite, uneven fracture, brittle, moderately hard.
2025-2030	70	<u>COAL</u> : As above.
	30	<u>SANDSTONE</u> : Translucent to clear, medium to very coarse grained, as above, fair to good inferred porosity, no fluorescence.
2030-2035	50	<u>COAL</u> : As above, trace sideritic infill of cleats, hard.
	40	<u>SANDSTONE</u> : As above, medium to very coarse grained, excellent inferred porosity, trace pyrite cemented quartz aggregates, no fluorescence.
	10	<u>SILTSTONE</u> : Medium brown, argillaceous with common to abundant carbonaceous material and interlaminae, blocky to subconchoidal, hard.
2035-2040	40	<u>COAL</u> : As above, trace siderite, hard.
	40	<u>SANDSTONE</u> : As above, medium to very coarse grained, subangular, very good inferred porosity no observed pyrite, no fluorescence.
	20	<u>SILTSTONE</u> : As above.
2040-2045	40	<u>COAL</u> : As above, silty, blocky, hard.
	40	<u>SILTSTONE</u> : As above, abundant carbonaceous and coal interlaminae.
	20	<u>SANDSTONE</u> : As above, medium to very coarse grained, subangular, very good inferred porosity, trace pyrite, no fluorescence.
2045-2050	70	<u>COAL</u> : As above, silty, trace siderite infilling cleats, hard.
	30	<u>SILTSTONE</u> : As above, very carbonaceous with coal laminae, blocky, firm to hard.
	Tr	<u>SANDSTONE</u> : As above, very clean, trace pyrite, no fluorescence.
2050-2055	95	<u>COAL</u> : Dominantly dark brown, dull silty, trace pyrite, conchoidal fracture, blocky, hard.
	5	<u>SILTSTONE</u> : As above, very carbonaceous, blocky, hard.
	TR	<u>SANDSTONE</u> : As above.
2055-2060	50	<u>COAL</u> : As above grading to carbonaceous siltstone.
	40	<u>SILTSTONE</u> : Medium to dark brown, occasionally tan, very carbonaceous, grading to carbonaceous siltstone, moderately argillaceous, abundant micromicaceous flakes, slightly arenaceous, firm to moderately hard, subfissile.
	10	<u>SANDSTONE</u> : 1) Trace: As above, medium to coarse grained, loose, fair inferred porosity.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2055-2060 (contd)		2) 10%: White to very light grey, very fine to fine grained, very well sorted, subangular to subrounded, weak to moderately siliceous cemented grain aggregates, trace white argillaceous matrix, carbonaceous fragments, finely laminated with siltstone and coal, very poor to tight visual porosity, no fluorescence (type 1 or 2) (trace to 10% moderately bright yellow dolomite mineral fluorescence).
2060-2065	30	<u>SILTSTONE</u> : As above.
	30	<u>COAL</u> : As above.
	40	<u>SANDSTONE</u> : As above for type 2 becoming fine to medium grained, poor to fair visual porosity, 10% mineral fluorescence, as above.
2065-2070	40	<u>SILTSTONE</u> : As above.
	30	<u>SANDSTONE</u> : As above for type 2 with 10% dolomitic mineral fluorescence and trace of type 1.
	30	<u>COAL</u> : As above.
2070-2075	60	<u>SANDSTONE</u> : White to translucent, loose and clean, medium grained, moderate to well sorted, subrounded, trace weak siliceous cement, trace pyrite, good inferred porosity, no fluorescence, trace mineral fluorescence (dolomite).
	20	<u>SILTSTONE</u> : As above.
	20	<u>COAL</u> : As above.
2075-2080	80	<u>SILTSTONE</u> : As above, carbonaceous and associated interlaminae of coal.
	20	<u>SANDSTONE</u> : White to translucent, fine grained, moderately tight, moderately sorted, subangular to subrounded, dolomite cement and trace pyrite cement, firm to hard, poor visual porosity, no fluorescence (20% mineral fluorescence).
2080-2085	60	<u>SILTSTONE</u> : As above.
	20	<u>COAL</u> : As above, trace siderite in coal cleats.
	20	<u>SANDSTONE</u> : As above, no fluorescence, 20% mineral fluorescence (dolomite), trace pyrite.
2085-2090	60	<u>SANDSTONE</u> : As above, fine to medium grained, strong dolomite cement, occasionally loose grains, 40% mineral fluorescence.
	40	<u>SILTSTONE</u> : As above.
	Tr	<u>COAL</u> : As above.
2090-2095	50	<u>SANDSTONE</u> : White to translucent, moderately loose, medium grained, moderately sorted, subangular to subrounded, 20% dolomite cement, trace common pyrite, moderate to good inferred porosity, no fluorescence, 20% mineral fluorescence (dolomite).

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
	45	<u>SILTSTONE</u> : As above.
	5	<u>COAL</u> : As above.
2095-2100	90	<u>COAL</u> : Dark brown to black, dull to subvitreous, silty, trace siderite, blocky, hard.
	10	<u>SILTSTONE</u> : Medium to dark brown, argillaceous and carbonaceous, common carbonaceous debris, firm to hard, blocky.
	Tr	<u>SANDSTONE</u> : As above, loose and clean, moderately sorted, no fluorescence.
2100-2105	50	<u>SANDSTONE</u> : As above, medium grained, moderately well sorted, subrounded, trace pyrite, no fluorescence.
	30	<u>SILTSTONE</u> : As above.
	20	<u>COAL</u> : As above.
2105-2110	60	<u>SILTSTONE</u> : As above.
	40	<u>COAL</u> : As above, dark brown to black, dull, silty, no siderite, silty laminae, blocky, hard.
2110-2115	40	<u>COAL</u> : As above.
	40	<u>SILTSTONE</u> : As above.
	20	<u>SANDSTONE</u> : As above, trace pyrite, no fluorescence.
2115-2120	60	<u>SILTSTONE</u> : As above, very carbonaceous.
	20	<u>SANDSTONE</u> : As above, medium to coarse grained, poorly sorted, subangular to subrounded, trace pyrite, no fluorescence.
	20	<u>COAL</u> : As above, very silty, hard.
2120-2125	90	<u>SILTSTONE</u> : As above, very carbonaceous, blocky, hard.
	10	<u>COAL</u> : As above, very silty, blocky, hard.
2125-2130	90	<u>SILTSTONE</u> : As above, very carbonaceous, trace pyrite.
	10	<u>COAL</u> : As above, silty, trace pyrite, blocky, hard.
	Tr	<u>SANDSTONE</u> : As above, trace dolomitic cement (?cavings?).
2130-2135	40	<u>SANDSTONE</u> : White to translucent, loose and clean, medium grained, moderately sorted, subrounded, trace dolomite and pyrite cement, good inferred porosity, no fluorescence.
	30	<u>SILTSTONE</u> : As above.
	30	<u>COAL</u> : As above.
2135-2140	80	<u>SANDSTONE</u> : White to translucent, loose to semi-tight, clean, medium grained, moderate to well sorted, subangular to subrounded, common dolomitic cement, trace pyrite, moderate inferred porosity, no fluorescence (some mineral fluorescence due to dolomite).
	15	<u>SILTSTONE</u> : As above.
	5	<u>COAL</u> : As above.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2140-2145	90	<u>SANDSTONE</u> : As above, subangular, trace dolomitic cement, no fluorescence.
	10	<u>SILTSTONE</u> : As above.
	Tr	<u>COAL</u> : As above.
2145-2150	80	<u>SILTSTONE</u> : As above, dominantly carbonaceous, hard, blocky.
	15	<u>COAL</u> : As above, dull, blocky.
	5	<u>SANDSTONE</u> : As above, medium to coarse grained, moderate to poorly sorted, subangular, trace dolomitic cement, good inferred porosity, no fluorescence.
2150-2155	70	<u>SANDSTONE</u> : White to cream, tight, very fine to fine grained, moderately sorted, subangular to subrounded, dolomitic cement, trace argillaceous matrix, trace pyrite, poor visual porosity, 50% moderate to dull yellow green mineral fluorescence due to dolomite, no cut, no residue.
	25	<u>SILTSTONE</u> : pale brown to dark brown, argillaceous and carbonaceous, trace carbonate detritus and trace pyrite, firm to moderately hard, blocky to subfissile.
	5	<u>COAL</u> : Dark brown to black, silty, dull, blocky, hard.
2155-2160	70	<u>SILTSTONE</u> : As above, dominantly medium to dark brown, very carbonaceous, fine laminations visible, plant fragments, firm to hard, blocky.
	20	<u>COAL</u> : As above, very silty, well laminated, blocky, hard.
	10	<u>SANDSTONE</u> : As above, some loose coarse grains amongst predominantly tight dolomite cemented sandstone, no fluorescence (10% mineral fluorescence from dolomite).
2160-2165	90	<u>COAL</u> : As above, very silty, well laminated, blocky, hard.
	10	<u>SANDSTONE</u> : White to translucent, dominantly loose and clean, medium grained, poor to moderately sorted, subangular to subrounded, trace dolomitic cement, trace pyrite, good inferred porosity, no fluorescence (5% mineral fluorescence due to dolomite).
2165-2170	60	<u>SANDSTONE</u> : Translucent to light grey, light brown to off white, fine to medium grained, poor to moderately sorted, subangular to subround, weak siliceous and dolomitic cement, trace white to light grey argillaceous matrix, generally loose grains with minor hard, brittle grain aggregates, poor to tight visual inferred porosity, no show, trace dull yellow mineral fluorescence.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2165-2170 (contd)	30	<u>SILTSTONE</u> : Medium to occasionally dark grey/brown, moderate to very argillaceous, trace carbonaceous flecks, slightly micromicaceous, moderately hard, subfissile.
	10	<u>COAL</u> : As above.
2170-2175	80	<u>SANDSTONE</u> : As above, becoming predominantly medium grained, moderately sorted, subrounded to subangular, weak siliceous cement, generally clean, loose with minor fine to very fine cemented grain aggregates, poor to fair inferred visual porosity, no fluorescence.
	10	<u>SILTSTONE</u> : As above.
	10	<u>COAL</u> : As above.
2175-2180	60	<u>SANDSTONE</u> : As above, predominantly medium grained, moderately to well sorted, subrounded, clean and loose, no observed cementing, moderate inferred porosity, no fluorescence.
	40	<u>COAL</u> : As above, blocky to subconchoidal, hard.
2180-2185	90	<u>COAL</u> : As above, predominantly dark brown/black, very silty, hard.
	10	<u>SANDSTONE</u> : As above, well sorted, subrounded, clean and loose, good inferred porosity, no fluorescence (trace dolomitic mineral fluorescence).
2185-2190	70	<u>COAL</u> : As above.
	20	<u>SILTSTONE</u> : As above, very carbonaceous, blocky.
	10	<u>SANDSTONE</u> : As above, trace dolomitic mineral fluorescence and amber.
2190-2195	60	<u>SILTSTONE</u> : As above, micromicaceous in part, trace carbonaceous microlaminae.
	30	<u>COAL</u> : As above, silty in part.
	10	<u>SANDSTONE</u> : As above.
2195-2200	60	<u>SILTSTONE</u> : As above, carbonaceous, blocky, hard.
	30	<u>SANDSTONE</u> : As above, medium to coarse grained, poorly sorted, subangular to subrounded, clean and loose, good inferred porosity, no fluorescence. (trace dolomitic mineral fluorescence).
	10	<u>COAL</u> : As above.
2200-2205	100	<u>COAL</u> : Dominantly black to dark brown, numerous silty interlaminae, trace siderite in cleats, waxy to dull, brittle, blocky to subconchoidal, hard.
	Tr	<u>SILTSTONE</u> : As above.
2205-2210	60	<u>SANDSTONE</u> : White to translucent, loose and clean, fine to coarse grained, very poorly sorted, subangular to subrounded, trace siliceous cement and trace dolomitic cement, trace pyrite, moderate to good inferred porosity (trace dolomitic mineral fluorescence).

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2205-2210 (contd)	20	<u>SILTSTONE</u> : As above.
	20	<u>COAL</u> : As above.
2210-2215	50	<u>SILTSTONE</u> : As above, high carbonaceous content, carbonaceous debris, blocky, moderately hard.
	30	<u>SANDSTONE</u> : As above, trace dolomitic cement, trace siliceous cement, trace pyrite, moderate inferred porosity, no fluorescence.
	20	<u>COAL</u> : As above, trace to common pyrite grains, silty, blocky, hard.
2215-2220	90	<u>SILTSTONE</u> : As above, dominantly light brown, moderate carbonaceous content, micromicaceous, trace arenaceous.
	10	<u>COAL</u> : As above.
2220-2225	90	<u>SILTSTONE</u> : As above, pale brown, argillaceous, trace dolomitic cement, trace arenaceous fine grains, moderately hard, subfissile to blocky.
	10	<u>COAL</u> : As above, trace siderite in cleats.
2225-2230	80	<u>SILTSTONE</u> : As above, medium to dark brown, very carbonaceous, hard, blocky to subconchoidal.
	20	<u>COAL</u> : As above, black to dark brown, silty, hard.
2230-2235	50	<u>COAL</u> : As above, black to dark brown, silty, no obs siderite or pyrite, hard.
	40	<u>SILTSTONE</u> : As above, pale brown, argillaceous, trace dolomitic cement, trace arenaceous grains, hard, blocky.
	10	<u>SANDSTONE</u> : As above, trace dolomitic cement, moderately loose and clean, trace pyrite, moderate inferred porosity, no fluorescence.
2235-2240	50	<u>SANDSTONE</u> : As above, medium grained, loose and clean, moderately sorted, subangular, trace siliceous and dolomitic cement, trace pyrite, moderate to good inferred porosity, no fluorescence.
	40	<u>COAL</u> : As above.
	10	<u>SILTSTONE</u> : As above.
2240-2245	40	<u>SANDSTONE</u> : As above, trace pyrite, trace dolomitic cement, trace dolomite mineral fluorescence, no fluorescence.
	40	<u>SILTSTONE</u> : As above, high carbonaceous content, carbonaceous debris, hard.
	20	<u>COAL</u> : As above.
2245-2250	70	<u>COAL</u> : Black to dark brown, numerous silty interlaminae, trace to common carbonaceous fragments associated with silty laminae, trace pyrite, dull, blocky to subconchoidal, hard.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2245-2250 (contd)	25	<u>SILTSTONE</u> : Pale brown, argillaceous with minor carbonaceous laminae, argillaceous/carbonaceous matrix, trace pyrite, trace arenaceous, abundant carbonaceous fragments, subfissile to blocky and laminae.
	5	<u>SANDSTONE</u> : White to cream, loose, medium to coarse grained, poorly sorted, subangular, trace dolomitic and siliceous cement, trace pyrite, good inferred porosity, no fluorescence (5% dolomite mineral fluorescence).
2250-2255	70	<u>COAL</u> : As above.
	20	<u>SILTSTONE</u> : As above.
	10	<u>SANDSTONE</u> : Off white to very light grey, very fine to fine, occasionally medium loose grained, very fine to fine grained aggregates are moderately well to well sorted, weak to moderate siliceous cement, trace white to light grey/brown argillaceous matrix, common coal and carbonaceous fragments, moderately micromicaceous, moderately hard to brittle grained aggregates, poor visual porosity, (Trace to 10%, dull yellow, patchy, mineral fluorescence from dolomite).
2255-2260	60	<u>COAL</u> : As above, very dull, silty, uneven fracture, brittle, moderately hard.
	20	<u>SILTSTONE</u> : Light to medium brown, medium brown/grey, moderately arenaceous grading to very fine arenaceous siltstone, moderately argillaceous, very carbonaceous in part grading to carbonaceous siltstone, moderately hard, subfissile.
	20	<u>SANDSTONE</u> : As above, fine to moderate grained, poor to fair inferred porosity, (Trace to 10% dolomite yellow patchy fluorescence).
2260-2265	70	<u>SILTSTONE</u> : As above.
	20	<u>COAL</u> : As above.
	10	<u>SANDSTONE</u> : As above, fine to medium grained, poorly sorted, weak siliceous/dolomitic cement, moderately hard grained aggregates, common loose grains, fair to poor inferred visual porosity, 10% mineral fluorescence.
2265-2270	80	<u>SILTSTONE</u> : Tan to medium brown, dark brown to dark brown/black, very carbonaceous, common coal fragments, moderately argillaceous, as above.
	20	<u>SANDSTONE</u> : As above, trace pyrite, trace dolomitic mineral fluorescence.
	TR	<u>COAL</u> : As above.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2270-2275	50	<u>SILTSTONE</u> : As above.
	40	<u>SANDSTONE</u> : Light grey to off white, occasionally translucent to clear, very fine to fine with common fine to medium loose grained, moderately sorted, subangular to subrounded, weak siliceous cement, trace moderately strong dolomitic cement grained aggregates, trace to moderate white argillaceous matrix, trace mica, trace pyrite nodules, poor to fair visual/inferred porosity, trace mineral fluorescence.
	10	<u>COAL</u> : As above.
2275-2280	50	<u>SILTSTONE</u> : As above, predominantly medium brown, as above.
	50	<u>SANDSTONE</u> : As above.
2280-2285	70	<u>COAL</u> : Black, very dull, silty, uneven fracture, moderately hard to hard, brittle.
	20	<u>SANDSTONE</u> : Light grey to light brown, very fine to fine grained, as above.
	10	<u>SILTSTONE</u> : As above.
2285-2290	60	<u>COAL</u> : As above, grading to carbonaceous siltstone.
	20	<u>SILTSTONE</u> : As above, becoming arenaceous with depth.
	20	<u>SANDSTONE</u> : Very fine to fine grained, cemented aggregates, as above.
2290-2295	50	<u>SANDSTONE</u> : As above.
	40	<u>SILTSTONE</u> : As above.
	10	<u>COAL</u> : As above.
2295-2300	70	<u>SANDSTONE</u> : 2 types (i) 80%, clear to translucent, occasionally light grey, fine to medium grained, poorly to moderately sorted, subangular, generally loose with occasionally weakly cemented grained aggregates with siliceous cement, trace white argillaceous matrix in aggregates, predominantly loose, aggregates are moderately hard, brittle, fair inferred/visual porosity, no show, trace dull yellow mineral fluorescence. (ii) 20%, as above, very fine to fine grained, well sorted, siliceous cemented grain aggregates.
	20	<u>SILTSTONE</u> : Medium brown/grey, medium to dark brown, moderately argillaceous, slightly to very carbonaceous with coaly fragments and microlaminae, slightly arenaceous, micromicaceous, trace lithic fragments, moderately hard to firm, subfissile to blocky.
	10	<u>COAL</u> : As above.
2300-2305	80	<u>SANDSTONE</u> : Becoming predominantly type (i) clear to translucent, predominantly medium grained, occasionally fine and coarse grained, moderately well to well sorted, subangular to subrounded, weak

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2300-2305 (contd)	15	siliceous cement, clean with no visible matrix, trace pyrite, trace quartz overgrowth surfaces, minor aggregates are moderately hard and brittle, fair to good inferred porosity, trace mineral fluorescence.
	5	<u>SILTSTONE</u> : As above. <u>COAL</u> : As above.
2305-2310	50	<u>SANDSTONE</u> : 80% type (1), 20% type (ii).
	40	<u>SILTSTONE</u> : Medium grey/brown, becoming mottled, moderately arenaceous in part, as above.
	10	<u>CLAYSTONE</u> : White to light grey, slightly arenaceous, very soft, slightly dispersive and sticky.
	Tr	<u>COAL</u> : As above.
2310-2315	60	<u>SANDSTONE</u> : 60% type (i), 40% type (ii).
	30	<u>SILTSTONE</u> : As above.
	10	<u>CLAYSTONE</u> : As above.
2315-2320	60	<u>SILTSTONE</u> : As above.
	40	<u>SANDSTONE</u> : Clear to translucent, light grey to off white, very fine to medium grained, poorly sorted, as above.
	Tr	<u>CLAYSTONE</u> : As above.
2320-2325	70	<u>SILTSTONE</u> : Medium grey and medium brown to dark brown, occasionally buff, moderately argillaceous, minor carbonaceous laminations, very arenaceous in part and grading to very fine grained dirty sandstone, trace lithic fragments, micromicaceous, firm to moderately hard, blocky to subfissile.
	20	<u>SANDSTONE</u> : Light brown to light grey and white, generally very fine to fine, occasionally medium loose grained, moderately well to well sorted, subangular to subrounded, weak siliceous and dolomitic cement, trace to minor white to light brown argillaceous matrix, common coal laminations and carbonaceous fragments, trace pyrite, aggregates are moderately hard, firm, brittle, very poor to poor visual porosity, trace dull yellow mineral (dolomite) fluorescence.
	10	<u>COAL</u> : As above, very woody texture.
	Tr	<u>CLAYSTONE</u> : As above.
2325-2330	50	<u>SILTSTONE</u> : As above.
	50	<u>SANDSTONE</u> : Becoming coarser, predominantly fine to medium grained, moderately sorted, subangular to subrounded, occasionally argillaceous, weak siliceous cemented grain aggregates in part, predominantly loose, trace light brown argillaceous matrix, as above, poor inferred porosity, no fluorescence.
	Tr	<u>COAL</u> : As above.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2330-2335	50	<u>SILTSTONE</u> : As above.
	45	<u>SANDSTONE</u> : As above, common mica flakes, trace dull yellow mineral fluorescence.
	5	<u>COAL</u> : As above.
2335-2340	80	<u>SANDSTONE</u> : Clear to translucent, fine to medium, rare coarse grained, moderately well sorted, subangular to subrounded, weak siliceous cement, trace dolomite cement, appears clean with loose grains, rare aggregates are friable, trace pyrite, minor mica flakes, fair to good inferred porosity, no show (trace dull yellow/orange mineral fluorescence).
	20	<u>SILTSTONE</u> : As above.
2340-2345	60	<u>SANDSTONE</u> : Generally as above, with minor very fine to fine grained cemented aggregates, having weak to moderate siliceous and dolomitic cement, minor white to light brown argillaceous matrix, friable to firm, poor visual porosity, trace mineral fluorescence.
	40	<u>SILTSTONE</u> : As above.
2345-1350	50	<u>SANDSTONE</u> : As above, dominantly fine to medium grain, poor to fair visual porosity, no show.
	50	<u>SILTSTONE</u> : As above.
2350-2355	50	<u>SANDSTONE</u> : Light grey to light brown, off white and clear to translucent in part, very fine to fine, occasionally medium grained, moderately well sorted, subangular to subrounded, as above with minor pyrite cement, poor visual porosity, trace dull yellow orange mineral fluorescence.
	50	<u>SILTSTONE</u> : Light grey to medium brown, occasionally very dark brown black, very argillaceous, abundant micromicaceous flecks, abundant carbonaceous flecks, slightly arenaceous, rare lithic fragments, minor pyrite, grading in part to very fine grained sandstone, moderately hard, blocky to subfissile.
	Tr	<u>COAL</u> : As above.
2355-2360	70	<u>SILTSTONE</u> : Medium to dark brown/grey, light grey, less carbonaceous, moderately argillaceous, very arenaceous in part and occasionally grading to very fine grained white sandstone, abundantly micromicaceous flecks, trace pyrite, firm to moderately hard, blocky to subfissile.
	30	<u>SANDSTONE</u> : As above.
	Tr	<u>COAL</u> : As above.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2360-2365	70	<u>SILTSTONE</u> : As above.
	30	<u>SANDSTONE</u> : Light grey/brown, off white, predominantly very fine to fine with occasionally medium loose grained, very fine to fine sandstone aggregates are well sorted, subangular to subrounded with a weak to moderately siliceous and dolomitic cement, minor quartz overgrowths evident, trace white argillaceous to silty matrix, common micaceous and carbonaceous laminae, aggregates are firm, friable to brittle, tracey pyrite, tight to poor visual porosity, 30% very dull patchy yellow/orange dolomitic mineral fluorescence.
2365-2370	60	<u>SILTSTONE</u> : As above.
	40	<u>SANDSTONE</u> : As above, with increased proportion of loose medium to rare coarse grains, predominantly very fine to fine grained, poor visual porosity, no show, 20% dull yellow/orange mineral fluorescence.
2370-2375	70	<u>SILTSTONE</u> : As above.
	20	<u>SANDSTONE</u> : As above, grading in part to arenaceous siltstone.
	10	<u>COAL</u> : Black, very silty, very dull to subvitreous lustre, moderately hard, uneven fracture, brittle.
2375-2380	70	<u>SILTSTONE</u> : As above.
	25	<u>SANDSTONE</u> : As above.
	5	<u>COAL</u> : As above.
2380-2385	85	<u>SILTSTONE</u> : Medium brown/grey, buff and dark brown/black, moderately argillaceous, abundantly micromicaceous flecks, slightly arenaceous, common carbonaceous plant remains along partings, firm, subfissile, dark brown/black siltstone is moderately carbonaceous, gradings in part to carbonaceous siltstone.
	10	<u>SANDSTONE</u> : As above.
	5	<u>COAL</u> :
2385-2390	70	<u>COAL</u> : As above, black, silty, dull to subvitreous lustre, hard, brittle.
	20	<u>SILTSTONE</u> : As above.
	10	<u>SANDSTONE</u> : As above, no fluorescence.
2390-2395	70	<u>SILTSTONE</u> : As above, high carbonaceous content, blocky, hard.
	20	<u>COAL</u> : As above, very silty with argillaceous interlaminae, dull to subvitreous, hard brittle.
	10	<u>SANDSTONE</u> : As above, trace siliceous cement, trace to common pyrite, good inferred porosity, no fluorescence.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2395-2400	60	<u>SILTSTONE</u> : As above, trace arenaceous and carbonaceous debris, blocky, hard.
	40	<u>COAL</u> : As above, silty interlaminated, dull, brittle.
	Tr	<u>SANDSTONE</u> : As above, trace argillaceous matrix, trace pyrite, good inferred porosity, no fluorescence.
2400-2405	40	<u>SILTSTONE</u> : Pale to medium brown, argillaceous with high carbonaceous content and trace arenaceous grains, trace pyrite and plant fragments, firm to moderately hard, blocky.
	40	<u>COAL</u> : Black to dark brown, very silty with interlaminae, dull, hard, blocky to subconchoidal, brittle.
	20	<u>SANDSTONE</u> : Cream to beige, quartz and slightly argillaceous, loose to moderately consolidated, very fine to fine grained, well sorted, subangular to subrounded, common argillaceous matrix, trace siliceous cement, trace micromicaceous flecks, trace pyrite, trace silty laminae, moderate to poor inferred porosity, no fluorescence.
2405-2410	40	<u>SILTSTONE</u> : As above, trace arenaceous to siltstone and trace carbonaceous debris.
	40	<u>COAL</u> : As above, trace pyritic nodules.
	20	<u>SANDSTONE</u> : As above, moderate to strong siliceous cement (localised) to moderately loose, no fluorescence.
2410-2415	50	<u>SILTSTONE</u> : As above, common arenaceous grains and carbonaceous fragments, hard, blocky.
	30	<u>COAL</u> : As above, dull, waxy, hard, brittle.
	20	<u>SANDSTONE</u> : As above, trace micromicaceous and argillaceous and carbonaceous debris, poor to moderate inferred porosity, no fluorescence, trace mineral fluorescence (trace dolomite).
2415-2420	50	<u>SANDSTONE</u> : As above, predominantly moderately tight, fine grained, moderately sorted, subangular to subrounded, dolomitic and siliceous cement, firm, trace carbonaceous fragments, trace pyrite, poor inferred porosity, no fluorescence.
	40	<u>SILTSTONE</u> : As above, common arenaceous grains, trace common carbonaceous fragments, trace micromicaceous flecks, hard, blocky, no fluorescence.
	10	<u>COAL</u> : As above.
2420-2425	60	<u>SILTSTONE</u> : As above, common arenaceous and carbonaceous, trace micromicaceous, hard, blocky.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2420-2425 (contd)	30	<u>SANDSTONE</u> : As above, abundant dolomitic cement (tight), firm, moderately hard, poor inferred porosity, no fluorescence, (20% mineral fluorescence).
	10	<u>COAL</u> : As above, silty, trace pyrite.
2425-2430	60	<u>SILTSTONE</u> : Pale to medium brown (occasionally dark brown), argillaceous with strong carbonaceous content, argillaceous matrix, trace arenaceous grains, trace pyrite, moderately hard, blocky.
	40	<u>SANDSTONE</u> : Cream to beige (occasionally pale brown), trace argillaceous, moderately tight to tight, fine grained, moderate to well sorted, subangular to subrounded, trace to common siliceous cement, common dolomitic cement, moderately hard, trace pyrite, trace micromicaceous, poor inferred porosity, 10-20% dull or dolomite mineral fluorescence.
2430-2435	70	<u>SILTSTONE</u> : As above, trace arenaceous grains, grades to fine sandstone, blocky, moderately hard.
	20	<u>SANDSTONE</u> : As above, trace pyrite.
	10	<u>COAL</u> : Black to dark brown, very silty, trace arenaceous grains, trace pyrite, dull to waxy, brittle, hard.
2435-2440	60	<u>SILTSTONE</u> : As above, numerous interlaminations, trace arenite, blocky, moderately hard.
	35	<u>SANDSTONE</u> : As above, trace pyrite, trace interlaminations of siltstone and coal, poor inferred porosity, no fluorescence, (trace mineral fluorescence).
	5	<u>COAL</u> : As above, trace amber, blocky, hard.
2440-2445	70	<u>SILTSTONE</u> : As above, common arenaceous grains and carbonaceous matter, trace pyrite, blocky, hard.
	20	<u>SANDSTONE</u> : As above, common dolomitic(sideritic) cement, trace pyrite, moderately hard, poor inferred porosity, 10-20% orange mineral fluorescence.
	10	<u>COAL</u> : As above, subvitreous, silty in bands, hard, brittle.
2445-2450	80	<u>COAL</u> : As above, trace pyrite nodules within larger cuttings, hard, blocky.
	15	<u>SILTSTONE</u> : As above, abundant carbonaceous interlaminations and trace pyrite, blocky.
	5	<u>SANDSTONE</u> : As above, trace fine carbonaceous fragments, trace coarse arenaceous grains, trace pyrite, poor inferred porosity, no fluorescence.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2450-2455	60	<u>SILTSTONE</u> : As above, trace to common arenaceous grains and carbonaceous fragments, trace pyrite, moderately hard, blocky.
	20	<u>SANDSTONE</u> : As above, common pyrite, trace to common carbonaceous and argillaceous fragments, poor inferred porosity, no fluorescence.
	20	<u>COAL</u> : As above, common silty interlamination, hard, blocky.
2455-2460	60	<u>SILTSTONE</u> : As above, common arenaceous grains, carbonaceous, micromicaceous, moderately hard, blocky.
	30	<u>SANDSTONE</u> : As above, well sorted, subangular to subrounded, dolomitic cement, argillaceous/carbonaceous matrix, poor inferred porosity, no fluorescence.
	10	<u>COAL</u> : As above, common argillaceous/silty interlamination, trace arenaceous grains, blocky, hard.
2460-2465		(Lagged after trip)
	30	<u>SILTSTONE</u> : Light grey to light grey/green, very calcareous, possibly cavings from bit trip.
	40	<u>SILTSTONE</u> : Buff to medium brown, occasionally dark brown, moderate to very argillaceous, common carbonaceous specks and detrital fragments, abundant micromicaceous, slightly arenaceous, firm to moderately hard, blocky.
	20	<u>SANDSTONE</u> : Light grey to off white, very fine to fine, rare medium grained, moderately well sorted, very fine to fine grained aggregates, subangular to subrounded, weak siliceous cement, trace white argillaceous matrix, medium grains are loose with minor pyrite, aggregates are moderately hard, friable to brittle, very poor visual porosity, no fluorescence.
2465-2470	10	<u>COAL</u> : As above.
		(Lagged after trip)
	40	<u>SILTSTONE</u> : Light grey, calcareous cavings, as above.
	20	<u>SILTSTONE</u> : As above.
2470-2475	30	<u>SANDSTONE</u> : Becoming commonly medium to coarse grained and as above, no fluorescence.
	10	<u>COAL</u> : As above.
	40	<u>SILTSTONE</u> : Light grey, very calcareous cavings, as above.
2470-2475	40	<u>SILTSTONE</u> : Medium brown, medium brown/grey, slightly carbonaceous, as above.
	20	<u>SANDSTONE</u> : As above, with minor medium loose quartz grain, poor visual porosity, trace dull yellow mineral fluorescence.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2475-2480	50	<u>SILTSTONE</u> : Medium brown, argillaceous with minor carbonaceous, abundantly micromicaceous, trace to common quartz fragments, firm to moderately hard, blocky.
	40	<u>SANDSTONE</u> : Off white to beige, very fine to fine grained (occasional trace medium to coarse (?cavings)), moderately well sorted, subangular to subrounded, weak siliceous and dolomitic cement, trace argillaceous and carbonaceous matrix, hard, very poor visual porosity, no fluorescence (trace mineral fluorescence).
	10	<u>COAL</u> : As above.
2480-2485	60	<u>SANDSTONE</u> : As above, commonly medium grained, no carbonaceous matrix, poor visual porosity, no fluorescence (trace mineral fluorescence).
	35	<u>SILTSTONE</u> : As above, abundant carbonaceous interlaminae, blocky, moderately hard.
	5	<u>COAL</u> : As above.
2485-2490	60	<u>SILTSTONE</u> : Pale brown to dark brown, argillaceous and abundant carbonaceous laminae, common quartz grains, moderately hard, blocky.
	40	<u>SANDSTONE</u> : As above, occasionally medium grained, moderately sorted, subangular to subrounded, trace siliceous and common dolomitic cement, moderately hard, poor inferred porosity, trace mineral fluorescence.
	Tr	<u>COAL</u> : As above, abundantly silty layers, trace quartz grains, blocky, hard.
2490-2495	50	<u>COAL</u> : As above, common amber (bright, pale green mineral fluorescence), blocky to subconchoidal, hard.
	25	<u>SILTSTONE</u> : As above, abundant carbonaceous layers, trace amber, hard, blocky.
	25	<u>SANDSTONE</u> : As above, trace argillaceous and carbonaceous matrix, moderately hard, trace pyrite, poor visual porosity, no fluorescence.
2495-2500	40	<u>COAL</u> : As above, dominantly black, common carbonaceous to argillaceous laminae, blocky, hard (trace amber fluorescence).
	30	<u>SILTSTONE</u> : As above, abundant arenaceous subequal with argillaceous matrix, common carbonaceous fragments, moderately hard, blocky.
	30	<u>SANDSTONE</u> : As above, very fine to fine grained, moderately tight, well sorted, subangular to subrounded, argillaceous matrix, trace siliceous cement, common

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2495-2500 (contd)		dolomitic cement, moderately hard, trace pyrite, poor visual porosity, no fluorescence, trace dolomitic mineral fluorescence.
2500-2505	80	<u>SILTSTONE</u> : Medium to dark brown, argillaceous to arenaceous to carbonaceous, dominantly argillaceous matrix, common micromicaceous flecks, trace plant remains, moderately hard, blocky.
	20	<u>SANDSTONE</u> : Off white to beige, moderately tight, fine grained, moderate to well sorted, subangular to subrounded, trace siliceous cement, common dolomitic cement, moderately hard to hard, trace pyrite, trace carbonaceous matter, poor visual porosity, no fluorescence.
2505-2510	80	<u>SILTSTONE</u> : As above, common arenaceous, blocky, hard.
	20	<u>SANDSTONE</u> : As above, poor visual porosity, no fluorescence.
	Tr	<u>COAL</u> : As above, subvitreous, blocky to conchoidal, hard.
2510-2515	60	<u>SILTSTONE</u> : As above, common carbonaceous debris and quartz grains, blocky, hard.
	40	<u>SANDSTONE</u> : As above, fine to medium grained, moderately sorted, subangular to subrounded, trace siliceous and common dolomitic cement, hard, trace pyrite, poor visual porosity, no fluorescence.
	Tr	<u>COAL</u> : As above.
2515-2520	80	<u>SILTSTONE</u> : As above, predominantly dark brown (occasionally medium brown), blocky, hard.
	20	<u>SANDSTONE</u> : As above, trace carbonaceous debris and pyrite, poor visual porosity, no fluorescence.
	Tr	<u>COAL</u> : As above.
2520-2525	90	<u>SILTSTONE</u> : As above, trace pyrite, blocky, hard.
	10	<u>SANDSTONE</u> : As above, trace pyrite, poor visual porosity, no fluorescence.
	Tr	<u>COAL</u> : As above, very silty and argillaceous interlaminae, hard, blocky.
2525-2530	90	<u>SILTSTONE</u> : Medium to dark brown (predominantly dark brown), argillaceous/arenaceous/carbonaceous, argillaceous matrix, trace plant remains, trace pyrite, moderately hard, blocky.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2525-2530 (contd)	10	<u>SANDSTONE</u> : Cream to beige (occasionally white), moderately tight, fine to medium grained (predominantly fine), moderately sorted, subangular to subrounded, trace siliceous cement, common dolomitic cement, poor inferred porosity, no fluorescence.
2530-2535	50	<u>SILTSTONE</u> : As above, abundant carbonaceous laminae, blocky, hard.
	40	<u>COAL</u> : As above, blocky, hard.
	10	<u>SANDSTONE</u> : (i) as above, common dolomitic cement, poor inferred porosity, no fluorescence. (ii) white to beige, loose and clean, medium to coarse grained, poorly sorted, subangular, trace pyrite, excellent inferred porosity, no fluorescence.
2535-2540	50	<u>COAL</u> : As above, dominantly black, subvitreous, brittle, blocky, hard.
	30	<u>SANDSTONE</u> : (i) (10%), as above, poor inferred porosity, no fluorescence. (ii) (20%), as above, excellent inferred porosity, no fluorescence.
	20	<u>SILTSTONE</u> : As above, blocky, hard.
2540-2545	50	<u>SILTSTONE</u> : As above, thicker carbonaceous laminae (up to lmm), blocky, hard.
	30	<u>SANDSTONE</u> : (i) as above, commonly fine to medium grained, well sorted, subangular to subrounded, common dolomitic cement, hard, poor inferred porosity, no fluorescence.
	20	<u>COAL</u> : As above.
2545-2550	50	<u>SILTSTONE</u> : As above, blocky, firm to moderately hard.
	50	<u>SANDSTONE</u> : (i) (30%), as above, poor inferred porosity, no fluorescence. (ii) (20%), as above, excellent inferred porosity, no fluorescence.
2550-2555	60	<u>SILTSTONE</u> : As above, medium brown predominantly, firm to moderately hard.
	30	<u>COAL</u> : As above, blocky, hard.
	10	<u>SANDSTONE</u> : (i) (10%), as above, excellent inferred porosity, no fluorescence. (ii) (Tr), as above, poor inferred porosity, no fluorescence.
2555-2560	60	<u>SANDSTONE</u> : (i) as above, medium to fine grained, moderately sorted, subangular to subrounded, abundant dolomitic cement, hard, very poor inferred porosity, no fluorescence.
	20	<u>SILTSTONE</u> : As above, firm to moderately hard, blocky.
	20	<u>COAL</u> : As above, trace amber, subvitreous, subconchoidal, hard.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2560-2565	70	<u>SILTSTONE</u> : Medium to dark brown, argillaceous with minor arenaceous fragments, carbonaceous common plant fragments, hard, blocky.
	20	<u>SANDSTONE</u> : White to grey, tight, fine grained, well sorted, subangular to subrounded, abundant dolomitic cement, trace carbonaceous debris, hard, very poor inferred porosity, no fluorescence.
	10	<u>COAL</u> : Black to dark brown, trace silty laminae, subvitreous, hard, blocky to conchoidal.
2565-2570	50	<u>SANDSTONE</u> : As above, trace pyrite, common dolomitic mineral fluorescence, no hydrocarbon fluorescence.
	45	<u>SILTSTONE</u> : As above, common carbonaceous debris, common quartz grains, hard, blocky.
	5	<u>COAL</u> : As above, subvitreous, conchoidal to blocky, hard.
2570-2575	50	<u>SILTSTONE</u> : As above, common quartz grains, common plant remains, hard, blocky.
	50	<u>SANDSTONE</u> : (i) (25%), white to off white, tight, fine grained, well sorted, subangular to subrounded, strong dolomitic cement, hard, trace pyrite, very poor inferred porosity, no fluorescence (shows), common dull orange mineral fluorescence. (ii) (25%), white to translucent, loose and clean, medium to very coarse grained, very poorly sorted, subangular to subrounded, loose, trace siliceous cement, very good inferred porosity, no fluorescence.
2575-2580	60	<u>SILTSTONE</u> : As above, common quartz and carbonaceous debris, hard, blocky.
	40	<u>SANDSTONE</u> : (i) (20%), as above, very poor inferred porosity, no fluorescence (trace dolomitic mineral fluorescence). (ii) (20%), as above, excellent inferred porosity, no fluorescence.
	Tr	<u>COAL</u> : As above, common silty laminae, blocky, hard.
2580-2585	80	<u>SILTSTONE</u> : As above, very common carbonaceous debris, common arenaceous, hard, blocky.
	20	<u>SANDSTONE</u> : As above, (i) (5%), very poor inferred porosity, no fluorescence (trace minor fluorescence). (ii) (15%), subrounded to rounded, excellent inferred porosity, no fluorescence.
2585-2590	90	<u>SILTSTONE</u> : As above, dominantly dark brown, very common carbonaceous matter, trace pyrite, blocky, hard.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2585-2590 (contd)	10	<u>SANDSTONE</u> : As above, (i) (5%), very poor inferred porosity, no fluorescence. (ii) (5%), very poor inferred porosity, no fluorescence.
	Tr	<u>COAL</u> : As above.
2590-2595	70	<u>SANDSTONE</u> : As above, (i) (50%), very fine to fine grained, occasionally silty, well sorted, weak siliceous cement, trace argillaceous matrix, very poor to tight visual porosity, no show, trace dull yellow mineral fluorescence. (ii) (20%), medium to rare coarse loose quartz grain, clean, with trace siliceous cement, indication quartz overgrowths, good inferred porosity, no fluorescence.
	30	<u>SILTSTONE</u> : As above.
2595-2600	50	<u>SANDSTONE</u> : Light grey to light grey/brown, occasionally off white, predominantly very fine to fine, very rare medium grained (5%), moderately well to well sorted, weak siliceous cement, trace dolomitic cement, minor white argillaceous matrix, common pyrite cement in some aggregates, trace carbonaceous fragments, minor lithic fragments, sandstone grading in part to arenaceous siltstone, aggregates are moderately hard, friable, with a very poor to poor visual porosity, trace dull yellow/orange mineral fluorescence.
	50	<u>SILTSTONE</u> : Medium to dark grey/brown, very arenaceous with a siliceous appearance in part, slightly argillaceous, commonly micromicaceous, trace coal fragments, minor disseminated pyrite, moderately hard to hard, blocky and angular.
2600-2605	40	<u>SANDSTONE</u> : As above.
	40	<u>SILTSTONE</u> : As above.
	20	<u>COAL</u> : Black, subvitreous lustre, uneven to subconchoidal fracture, moderately hard, brittle.
2605-2610	70	<u>SILTSTONE</u> : Medium to dark grey/brown, medium brown, as above.
	30	<u>SANDSTONE</u> : As above.
	Tr	<u>COAL</u> : As above.
2610-2615	60	<u>SILTSTONE</u> : As above.
	40	<u>SANDSTONE</u> : Light brown, off white to light grey, very fine to fine grained, grading to medium in part, generally as above, poor visual porosity, no fluorescence.
	Tr	<u>COAL</u> : As above.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2615-2620	70	<u>SANDSTONE</u> : Clear to translucent, fine to predominantly medium grained, moderately well sorted, subrounded, weak siliceous cement as indicated by minor aggregates, generally sandstone is loose and clean, good inferred porosity, no fluorescence.
	30	<u>SILTSTONE</u> : Medium brown, very micromicaceous, moderately argillaceous, slightly arenaceous in part, trace pyrite, firm to moderately hard, blocky, subfissile.
2620-2625	60	<u>SANDSTONE</u> : As above, fair occasionally good inferred porosity, no fluorescence with minor very fine to fine moderately siliceous cemented grained aggregates, aggregates have minor argillaceous matrix and are moderately hard and friable with a poor visual porosity, no fluorescence.
	40	<u>SILTSTONE</u> : As above.
	Tr	<u>COAL</u> : As above.
2625-2630	70	<u>SANDSTONE</u> : 2 types: (i) 50%, clear to translucent, predominantly medium, occasionally grading fine to coarse grained, moderately sorted, subangular to subrounded, generally loose with minor weakly cemented grain aggregates, with siliceous cement, minor very fine siliceous and argillaceous matrix, sandstone is generally loose with a good inferred porosity, no fluorescence. (ii) 20%, light brown to off white, very fine to fine grained aggregates, well sorted, subrounded, weak siliceous and dolomitic cement, moderately argillaceous matrix, trace carbonaceous flecks and detrital fragments, trace mica flecks, friable to brittle, moderately hard, poor visual porosity, no show, trace dull yellow mineral fluorescence.
	30	<u>SILTSTONE</u> : As above.
	90	<u>SANDSTONE</u> : As above, for type (i), becoming predominantly medium to coarse grained, good to very good inferred porosity, no fluorescence, trace type (ii).
2630-2635	10	<u>SILTSTONE</u> : Very dark brown, brown/black, slight argillaceous, moderately arenaceous, common micromicaceous flecks, minor carbonaceous flecks and detrital fragments, firm, subfissile.
	Tr	<u>COAL</u> : Black, very dark brown, moderately silty, dull to subvitreous lustre, subfissile, moderately hard, firm.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2635-2640	95	<u>SANDSTONE</u> : Clear to translucent, medium to coarse grained, predominantly loose, good to very good inferred porosity, no fluorescence.
	5	<u>SILTSTONE</u> : As above.
2640-2645	90	<u>SANDSTONE</u> : Translucent to clear, medium to coarse grained, occasionally very coarse angular bit fracture grains, poorly to moderately sorted, subangular to subrounded, predominantly subangular, weak siliceous and dolomitic cement on some aggregates, generally loose and clean, minor aggregates are firm, friable, good to very good inferred porosity, trace dull yellow mineral fluorescence.
	10	<u>SILTSTONE</u> : As above, with common coal fragments.
	Tr	<u>COAL</u> : As above.
2645-2650	95	<u>SANDSTONE</u> : As above.
	5	<u>SILTSTONE</u> : As above.
2650-2655	100	<u>SANDSTONE</u> : Translucent to clear, medium to coarse, predominantly coarse grained, weak to moderate siliceous cement in part, generally as above, very good inferred porosity, no fluorescence.
	Tr	<u>SILTSTONE</u> : As above.
2655-2660	100	<u>SANDSTONE</u> : Clear to translucent, medium to coarse grained, moderately well to well sorted, subangular to subrounded, trace to weak siliceous and dolomitic cement in rare aggregates, predominantly loose, very clean, very good inferred porosity, trace dull yellow/orange mineral fluorescence.
2660-2665	95	<u>SANDSTONE</u> : As above, very good inferred porosity, no show.
	5	<u>SILTSTONE</u> : Very dark brown, very carbonaceous, moderately argillaceous, slightly micromicaceous, moderately hard to firm, subfissile.
2665-2670	75	<u>SANDSTONE</u> : As above, coarse to very coarse, predominantly coarse grained, common shattered grains, moderate siliceous cement, trace dolomite cement, grains generally loose with minor aggregates which are hard to very hard and brittle, fair inferred porosity, no show (trace very dull yellow mineral fluorescence).
	20	<u>SILTSTONE</u> : As above.
	5	<u>COAL</u> : Black, very dark brown/black, common silty laminae, dull to subvitreous, uneven frost, fissile and subfissile in part, hard, brittle.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2670-2675		(Sample unwashed is very clayey and sticky).
	50	<u>SANDSTONE</u> : As above.
	30	<u>SILTSTONE</u> : Medium to dark brown, argillaceous, commonly micromicaceous, and carbonaceous, moderately hard, subfissile.
	20	<u>CLAYSTONE</u> : Medium to light brown slightly arenaceous, common coal and carbonaceous fragments, very soft and soluble (washing out of sample).
2675-2680	90	<u>COAL</u> : Black, subvitreous to vitreous, slightly silty, moderately hard to hard, brittle with a subconchoidal break.
	10	<u>SANDSTONE</u> : As above.
2680-2685	50	<u>SILTSTONE</u> : Very dark brown, occasionally buff to medium brown, very argillaceous, abundant coal laminations and fragments, slight micromicaceous, light brown siltstone is slightly arenaceous, siltstone is fissile with a strong bedding cleavage, moderately hard.
	50	<u>COAL</u> : As above.
	Tr	<u>SANDSTONE</u> : As above.
2685-2690	90	<u>SILTSTONE</u> : As above, becoming very micromicaceous, slightly pyritic.
	10	<u>COAL</u> : As above.
	Tr	<u>SANDSTONE</u> : Translucent to clear, medium to coarse loose quartz grained.
2690-2695	60	<u>SILTSTONE</u> : As above.
	30	<u>SANDSTONE</u> : Off white, clear to translucent, very fine to medium, occasionally coarse grained, poorly sorted, subangular, moderate to coarse grains are loose, very fine to fine grained aggregates are moderately cemented with siliceous cement, common quartz overgrowth surfaces visible, trace white argillaceous matrix, common pyrite (cement coating grains and disseminated nodules), poor to fair visual porosity, no fluorescence.
	10	<u>COAL</u> : As above.
2695-2700	80	<u>COAL</u> : As above.
	20	<u>SILTSTONE</u> : As above, very carbonaceous, grading to coal in part.
2700-2705	75	<u>SILTSTONE</u> : Medium to dark brown, argillaceous/arenaceous/carbonaceous (dominantly argillaceous), trace plant remains and pyrite, moderately hard, blocky.
	20	<u>SANDSTONE</u> : Off white to cream, moderately tight, fine to medium grained, moderately sorted, subangular to subrounded, trace siliceous and trace dolomitic cement, hard, trace pyrite,

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2700-2705 (contd)	5	poor visual porosity, trace fluorescence (moderately yellow/green, no crush cut, no residue). <u>COAL</u> : As above.
2705-2710	60	<u>SILTSTONE</u> : As above, abundant quartz grains (fine) and plant matter, moderately hard, blocky.
	40	<u>SANDSTONE</u> : As above, common coarse grains of clear quartz, poor visual porosity, trace fluorescence (as above).
	Tr	<u>COAL</u> : Black to dark brown, trace silty, dull, blocky, moderately hard.
2710-2715	100	<u>SANDSTONE</u> : White to off white, dominantly loose and clean (minor moderately tight aggregates), medium grained, moderately well sorted, subangular to subrounded, trace siliceous cement, trace common dolomitic cement, minor aggregates, moderately hard, common pyrite, good inferred porosity, trace moderate bright yellow/green fluorescence, no cut, no residue, trace mineral fluorescence (dolomitic).
	Tr	<u>SILTSTONE</u> : As above, common plant fragments, blocky, hard.
2715-2720	90	<u>SANDSTONE</u> : As above, medium to coarse grained, moderately sorted, subangular to subrounded, trace dolomitic cement, common pyrite, very good inferred porosity, no fluorescence.
	5	<u>SILTSTONE</u> : As above, common arenaceous medium to fine grains, blocky, moderately hard.
	5	<u>COAL</u> : As above, slightly silty, blocky, hard.
2720-2725	60	<u>SANDSTONE</u> : As above, trace to common pyrite, very good inferred porosity, no fluorescence.
	40	<u>SILTSTONE</u> : As above, common arenaceous, blocky, moderately hard.
2725-2730	70	<u>SILTSTONE</u> : As above, strongly arenaceous, moderately argillaceous, common micromicaceous, moderately hard, blocky.
	30	<u>SANDSTONE</u> : As above, trace dolomitic cement aggregating grains, moderate to good inferred porosity, no fluorescence.
2730-2735	70	<u>SILTSTONE</u> : As above, moderately arenaceous, moderately argillaceous and moderately carbonaceous, common to trace micromicaceous, firm to hard, subfissile to blocky.
	30	<u>COAL</u> : Black to very dark brown, slightly silty, dull, subfissile to blocky, moderately hard.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2735-2740	100	<u>SILTSTONE</u> : As above, dominantly carbonaceous/argillaceous, abundant carbonaceous debris and laminae, moderately hard, blocky.
	Tr	<u>COAL</u> : As above.
2740-2745	80	<u>SILTSTONE</u> : As above, dominantly carbonaceous/argillaceous, abundant carbonaceous debris, hard, blocky.
	10	<u>SANDSTONE</u> : Cream to beige, moderately tight, fine grained, well sorted, subrounded, trace siliceous and dolomitic cement, moderately hard, trace pyrite, poor inferred porosity, no fluorescence.
	10	<u>COAL</u> : As above.
2745-2750	70	<u>SILTSTONE</u> : As above, trace carbonaceous debris, blocky, hard.
	20	<u>COAL</u> : As above, trace pyrite, blocky to subconchoidal, hard.
	10	<u>SANDSTONE</u> : As above, poor inferred porosity, no fluorescence.
2750-2755	90	<u>SILTSTONE</u> : As above, common to abundant carbonaceous debris, blocky, hard.
	5	<u>SANDSTONE</u> : As above, poor inferred porosity.
	5	<u>COAL</u> : As above, trace pyrite, trace siltstone, dull, blocky to subconchoidal, hard.
2755-2760	90	<u>COAL</u> : Black, trace silty bands, subvitreous, blocky and angular, hard.
	10	<u>SILTSTONE</u> : As above, abundant carbonaceous debris, blocky, hard.
	Tr	<u>SANDSTONE</u> : White to off white, loose and clean, medium to coarse grained, subangular to subrounded, trace siliceous cement, loose, good inferred porosity, no fluorescence.
2760-2765	60	<u>SILTSTONE</u> : As above, abundant carbonaceous debris, blocky, hard.
	20	<u>COAL</u> : As above, subvitreous, blocky to subconchoidal, hard.
	20	<u>SANDSTONE</u> : As above, loose and clean, very good inferred porosity, no fluorescence.
2765-2770	30	<u>SILTSTONE</u> : Very dark brown to black/brown, dominantly argillaceous and carbonaceous matrix, trace to common quartz grains, trace micromicaceous, moderately hard.
	60	<u>SANDSTONE</u> : White to off white, loose and clean, medium to very coarse, poorly sorted, subangular, trace siliceous cement, trace pyrite, very good inferred porosity, weak intensity dull blue white to blue green patchy fluorescence, no cut, weak to negligible crush cut, very thin film residue.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2765-2770 (contd)	10	<u>COAL</u> : As above, dull, blocky, hard.
2770-2775	90	<u>SANDSTONE</u> : As above, very loose and clean, coarse to very coarse grained, excellent inferred porosity, trace mica, 20 to maximum 30% moderately intense blue white to green fluorescence, no cut, negligible crush cut, thin dull film residue.
	10	<u>SILTSTONE</u> : As above, high carbonaceous content.
	Tr	<u>COAL</u> : As above.
2775-2780	90	<u>SANDSTONE</u> : As above, trace carbonaceous debris disseminated, weak to moderate blue/green fluorescence (10%), weak cut, thin film residue.
	10	<u>SILTSTONE</u> : As above, common to abundant arenaceous, trace carbonaceous.
	Tr	<u>COAL</u> : As above.
2780-2785	90	<u>SANDSTONE</u> : As above, trace pyrite, moderate to good inferred porosity, up to 10% blue green low intensity fluorescence, no immediate cut, weak crush cut, very thin film residue.
	10	<u>CAVINGS</u> : Siltstone/limestone/coal.
2785-2790	100	<u>SANDSTONE</u> : Off white to translucent, moderately loose to subaggregated, fine to medium grained, moderately to well sorted, subangular to subrounded, trace to common siliceous cement, trace dolomitic cement, trace argillaceous matrix associated with aggregates, firm to moderately hard, trace pyrite (?cavings), trace muscovite, poor visual porosity, trace blue white fluorescence, low intensity, no observable cut and very weak to absent crush cut (yellow), trace film residue, trace dull orange mineral fluorescence (dolomitic).
	Tr	<u>COAL & SILTSTONE</u> : (cavings).
2790-2795	95	<u>SANDSTONE</u> : As above, common siliceous cement and dolomitic cement, trace to common muscovite, poor visual porosity (apparent tightness), trace blue white fluorescence, low intensity, no cut, no crush cut.
	5	<u>SILTSTONE & COAL</u> : (cavings? and associated limestone and claystone).
2795-2800	95	<u>SANDSTONE</u> : As above, common to abundant dolomitic and sideritic cement, trace muscovite, moderate to poor visual porosity, trace blue white fluorescence (low to moderate intensity), no cut, no crush cut.
	5	<u>SILTSTONE</u> : Dark brown, dominantly argillaceous with abundant carbonaceous and arenaceous debris in matrix, trace pyrite and plant debris, moderately hard, blocky.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2800-2805	95	<u>SANDSTONE</u> : As above, abundant dolomitic cement, moderate to poor visual porosity, no fluorescence observable.
	5	<u>SILTSTONE</u> : As above, very arenaceous, siliceous cement, trace carbonaceous and quartz grains (coarse), blocky, hard.
2805-2810	50	<u>SANDSTONE</u> : As above, common cement (dolomitic), moderate to good visual porosity, common mineral fluorescence (dolomitic).
	50	<u>COAL</u> : Black, trace silty laminae, subvitreous, blocky, hard.
2810-2815	90	<u>SANDSTONE</u> : As above, trace to common dolomitic cement, moderate to good visual porosity, trace common mineral fluorescence (dolomitic), trace blue green fluorescence, no cut, no crush cut.
	10	<u>SILTSTONE</u> : Dark brown, dominantly argillaceous, trace to common arenaceous and carbonaceous, trace carbonaceous plant debris in matrix, moderately hard, blocky.
	Tr	<u>COAL</u> : As above.
2815-2820	80	<u>SANDSTONE</u> : As above, trace dolomitic cement, firm to moderately hard, trace sideritic cement, moderate to good inferred porosity, trace mineral fluorescence.
	10	<u>SILTSTONE</u> : As above, trace to common arenaceous grains in matrix, common carbonaceous interlaminae, moderately hard, blocky.
	10	<u>COAL</u> : Black to dark brown, trace to common silty laminae, subvitreous to dull, blocky, hard.
2820-2825	50	<u>COAL</u> : As above, dominantly subvitreous, blocky to subconchoidal, hard.
	40	<u>SANDSTONE</u> : As above, trace to common dolomitic cement, trace siliceous cement, moderately hard aggregates, good visual porosity, trace mineral fluorescence.
	10	<u>SILTSTONE</u> : As above, common to abundant carbonaceous debris and laminae, blocky.
2825-2830	60	<u>COAL</u> : As above, common carbonaceous and argillaceous laminae, hard, subvitreous, blocky to subconchoidal.
	20	<u>SANDSTONE</u> : As above, moderate to good visual porosity, no fluorescence.
	20	<u>SILTSTONE</u> : As above, common micromicaceous, hard, blocky.
2830-2835	40	<u>SILTSTONE</u> : Medium to dark brown, argillaceous/arenaceous/carbonaceous, common arenaceous matrix, common quartz grains and micromicaceous, hard, blocky.

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Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2830-2835 (contd)	30	<u>SANDSTONE</u> : White to off white, moderately loose, fine to medium grained, moderately sorted, subangular to subrounded, trace siliceous, common dolomitic cement, trace mica, moderate visual porosity, no fluorescence.
	30	<u>COAL</u> : Black to dark brown, trace silty laminae, dull to subvitreous, blocky to subconchoidal, hard.
2835-2840	40	<u>COAL</u> : As above, argillaceous laminae, blocky, hard.
	40	<u>SILTSTONE</u> : As above, common carbonaceous and quartz debris, common mica, hard, blocky.
	20	<u>SANDSTONE</u> : As above, abundant dolomitic cement, trace mica, moderate to poor visual porosity, no fluorescence.
2840-2845	50	<u>SILTSTONE</u> : As above, common to abundant arenaceous and carbonaceous debris, moderately hard, blocky.
	30	<u>COAL</u> : Black, trace pyrite, subvitreous, subconchoidal, hard.
	20	<u>SANDSTONE</u> : As above, abundant dolomitic cement (tight), moderately hard to hard, trace pyrite, very poor inferred porosity, no fluorescence (trace dolomitic mineral fluorescence).
2845-2850	70	<u>SANDSTONE</u> : White to translucent, moderately loose, fine to medium grained, moderately sorted, subangular to subrounded, common dolomitic cement, moderately hard to hard, trace pyrite, moderate inferred porosity, no fluorescence.
	20	<u>SILTSTONE</u> : Medium to dark grey, dominantly argillaceous, common arenaceous and carbonaceous matrix, trace plant fragments, moderately hard.
	10	<u>COAL</u> : Dominantly black, trace silty, trace pyrite nodules, dull to subvitreous, blocky to subconchoidal, hard.
2850-2855	80	<u>SANDSTONE</u> ; As above, trace argillaceous matrix, trace pyrite, moderately hard aggregates, moderate inferred porosity, trace mineral fluorescence.
	10	<u>SILTSTONE</u> : As above, common arenaceous, moderately hard, blocky.
	10	<u>COAL</u> : As above, trace pyrite, subvitreous, subconchoidal, hard.
2855-2860	90	<u>SANDSTONE</u> : White to translucent, moderately loose, medium coarse grained, poorly sorted, subangular to subrounded, common dolomitic cement, trace pyrite, moderate to good porosity, trace mineral fluorescence.
	10	<u>SILTSTONE</u> : As above, trace plant debris, moderately hard, blocky.
	Tr	<u>COAL</u> : As above, subvitreous, blocky to subconchoidal, hard, brittle.

CONGER-1

Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2860-2865	70	<u>SANDSTONE</u> : Translucent to clear, light brown, predominantly medium to coarse loose grains, minor very coarse angular grains and very fine to fine grained aggregates, poorly sorted, angular to subrounded, moderate siliceous cement, trace dolomitic cement, generally loose with aggregates having trace argillaceous matrix, aggregates are moderately hard, brittle, poor inferred porosity, trace dull orange mineral fluorescence, no cut.
	20	<u>SILTSTONE</u> : Dark brown, dark brownish grey, moderately argillaceous, slightly carbonaceous, minor micromicaceous flecks, firm, blocky.
	10	<u>COAL</u> ; Black, subvitreous lustre, subconchoidal to uneven fracture, slightly pyritic, hard, brittle.
2865-2870	85	<u>SANDSTONE</u> : Generally as above, predominantly coarse, trace mineral fluorescence as above.
	10	<u>SILTSTONE</u> : As above.
	5	<u>COAL</u> : As above.
2870-2875	85	<u>SANDSTONE</u> : As above.
	10	<u>SILTSTONE</u> : As above.
	5	<u>COAL</u> : As above.
2875-2880	90	<u>SANDSTONE</u> : Translucent to milky, occasionally clear, medium to very coarse, predominantly coarse to very coarse grained, poorly sorted, angular to subangular, most grains are shattered rather than breaking along grain boundaries inferring either very large grains and pebbles or very strong siliceous cement, trace dolomitic cement, clean grains with no matrix, minor aggregates are very hard, poor to tight inferred porosity, trace dull orange/brown mineral fluorescence.
	10	<u>SILTSTONE</u> : As above.
	Tr	<u>COAL</u> : As above.
2880-2885	85	<u>SANDSTONE</u> : Translucent to milky, very coarse to coarse as above, also minor (10%) medium to fine grained aggregates, moderately to poorly sorted, angular to subrounded, moderate to strong siliceous and dolomitic cement, generally clean, trace dolomitic cement, aggregates are moderately hard, brittle, poor to tight visual porosity, overall porosity is poor, trace dull orange mineral fluorescence.
	15	<u>SILTSTONE</u> : Medium to dark grey/brown, slightly argillaceous and arenaceous, trace pyrite and micromicaceous flecks, moderately hard, brittle in part, blocky.
	Tr	<u>COAL</u> : As above.

CONGER-1

Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2885-2890	95	<u>SANDSTONE</u> : As above, no shows.
	5	<u>SILTSTONE</u> : As above.
2890-2895	90	<u>SANDSTONE</u> : 60% (i) generally as above, coarse to very coarse, angular, no fluorescence. 30% (ii) light brown/grey, off white, predominantly fine, occasionally medium grained, moderately well sorted, subangular, moderately strong siliceous cement, very slightly dolomitic, minor white to light grey argillaceous matrix, common quartz overgrowth surfaces, moderately hard to hard, brittle, tight to very poor visual porosity, trace dull orange mineral fluorescence.
	10	<u>SILTSTONE</u> : Medium to dark grey/brown as above, becoming slightly arenaceous, grading in part to very dirty fine grained sandstone, trace pyrite, minor carbonaceous fragments, moderately hard to firm, blocky to subfissile.
2895-2900	95	<u>SANDSTONE</u> : 70% (i) as above, very coarse to coarse grained, abundant quartz overgrowth surfaces, grains are generally fractured shards, very angular, loose, no fluorescence. 25% (ii) as above.
	5	<u>SILTSTONE</u> ; As above.
2900-2905	90	<u>SANDSTONE</u> : 60% (i) as above. 30% (ii) light brown/grey, light brown, very fine to fine, occasionally medium grained, as above, trace dull yellow orange mineral fluorescence.
	10	<u>SILTSTONE</u> ; As above.
2905-2910	95	<u>SANDSTONE</u> : 45% (i) as above, coarse to very coarse, loose quartz grains, bit fractured. 50% (ii) light brown, cream, very fine to fine grained, moderately sorted, subangular to subrounded, moderately strong siliceous cement, minor argillaceous matrix, trace mica flecks, trace carbonaceous fragments, hard, brittle, tight to poor visual porosity, trace dull yellow mineral fluorescence.
	5	<u>SILTSTONE</u> : As above, very carbonaceous in part grading to carbonaceous siltstone.
	Tr	<u>COAL</u> : Black, very dark brown/black, silty, uneven fracture, brittle, hard.
2910-2915	85	<u>SANDSTONE</u> : 35% (i) translucent to milky, very coarse to coarse grained, (pebbly, conglomeratic), poorly sorted, angular, well cemented with siliceous cement giving abundant quartz overgrowths, clean, loose grains, occasional pyrite and carbonaceous coating on some grains, poor inferred porosity, no fluorescence.

CONGER-1

Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2910-2915 (contd)		50% (ii) light brown, off white, very fine to fine grained, moderately sorted, subangular to subrounded, moderate siliceous cement, trace off white to light brown argillaceous matrix, friable, trace carbonaceous specks and microlaminae, trace pyrite, moderately hard, tight to very poor visual porosity, trace dull mineral fluorescence.
	15	<u>SILTSTONE</u> : As above.
2915-2920	90	<u>SANDSTONE</u> : 40% (i) as above, coarse to very coarse loose fractured grains. 50% (ii) as above, very fine to fine, rare medium grains, cemented aggregates, no show.
	5	<u>SILTSTONE</u> : As above.
	5	<u>COAL</u> : As above.
2920-2925	80	<u>SANDSTONE</u> : 20% (i) as above. 60% (ii) as above, (trace dull yellow/orange mineral fluorescence with no cut or residue).
	20	<u>SILTSTONE</u> : As above.
2925-2930	70	<u>SANDSTONE</u> ; 20% (i) translucent to milky, occasionally clear, very coarse to coarse grained, generally as above with common pyrite cement/coating on grains. 50% (ii) off white to light brown, very fine to fine, well to moderately well sorted, subangular to subrounded, moderately well cemented with siliceous cement, trace light brown argillaceous matrix, trace pyrite nodules, rare lithic and feldspar fragments, firm to moderately hard, friable, very poor to tight visual porosity, trace dull orange mineral fluorescence.
	25	<u>SILTSTONE</u> : Very dark brown, dark brown/grey, moderately to very argillaceous, slightly arenaceous, moderately carbonaceous, firm to moderately hard, subfissile.
	5	<u>COAL</u> ; As above.
2930-2935	50	<u>SANDSTONE</u> : (ii) as above, trace type (i) as above.
	50	<u>SILTSTONE</u> : As above.
	Tr	<u>COAL</u> : As above.
2935-2940	80	<u>SANDSTONE</u> : (ii) (80%), off white to cream, fine grained, moderately sorted, subangular to subrounded, moderately strong siliceous and dolomitic cement and trace argillaceous matrix, moderately hard, trace pyrite, trace carbonaceous, trace mica, moderate to poor visual porosity, trace to 10% moderately bright green fluorescence, no cut and very weak to absent crush cut, very thin pale film residue, (i) (tr) as above.

CONGER-1

Lithology Descriptions

<u>Depth</u>	<u>%</u>	<u>Description</u>
2935-2940 (contd)	10	<u>SILTSTONE</u> : Dark brown, dominantly argillaceous, commonly arenaceous and carbonaceous, moderately hard, blocky.
	10	<u>COAL</u> : Black to dark brown, dull to waxy, brittle, blocky, hard.
2940-2945	80	<u>SANDSTONE</u> : (ii) as above, trace medium grains, trace pyrite, poor visual porosity, trace to 10% moderately bright blue to green fluorescence, no cut, weak to moderate crush cut, very thin moderate intensity yellow to green film residue, trace mineral fluorescence.
	20	<u>SILTSTONE</u> : As above, trace pyrite, blocky, hard.
	Tr	<u>COAL</u> : As above, blocky to subconchoidal fracture, brittle, hard.
2945-2950	75	<u>SANDSTONE</u> : (ii) as above, trace pyrite, poor visual porosity, trace fluorescence as above.
	25	<u>SILTSTONE</u> : As above, commonly carbonaceous, blocky, hard.
	Tr	<u>COAL</u> : As above, trace pyrite nodules, brittle, hard.
2950-2955	75	<u>SANDSTONE</u> : As above, trace micromicaceous flecks, trace pyrite, very poor visual porosity, trace dull orange mineral fluorescence.
	20	<u>SILTSTONE</u> : Very dark brown, dominantly argillaceous slightly arenaceous and carbonaceous, moderately hard, blocky.
	5	<u>COAL</u> : Very dark brown, slightly silty, trace pyrite, dull, blocky, brittle, hard.
2955-2960	90	<u>SANDSTONE</u> : As above, trace pyrite, trace carbonaceous flecks, very poor visual porosity, no fluorescence, trace dull orange mineral fluorescence.
	10	<u>SILTSTONE</u> : As above, trace plant debris, moderately hard, blocky.
2960-2965	80	<u>SANDSTONE</u> : As above, trace pyrite, common mica, very poor visual porosity, no fluorescence, trace dull orange mineral fluorescence.
	20	<u>SILTSTONE</u> : As above, common micromicaceous flecks, trace plant debris, trace pyrite, moderately hard, blocky.
	Tr	<u>COAL</u> : As above.
2965-2970	70	<u>SANDSTONE</u> : As above, trace pyrite, trace carbonaceous, common mica flakes, very poor visual porosity, no fluorescence, trace mineral fluorescence (dolomitic/sideritic).
	30	<u>SILTSTONE</u> : As above, trace pyrite, common micromicaceous, common arenaceous grains, moderately hard, blocky.
	Tr	<u>COAL</u> : As above, trace pyrite nodules, subvitreous to dull, blocky, brittle, hard.

APPENDIX 2

Core No. 1

Well : Conger-1

Interval Cored : 2776m - 2794.5m

Recovered : 18.23m (98%)

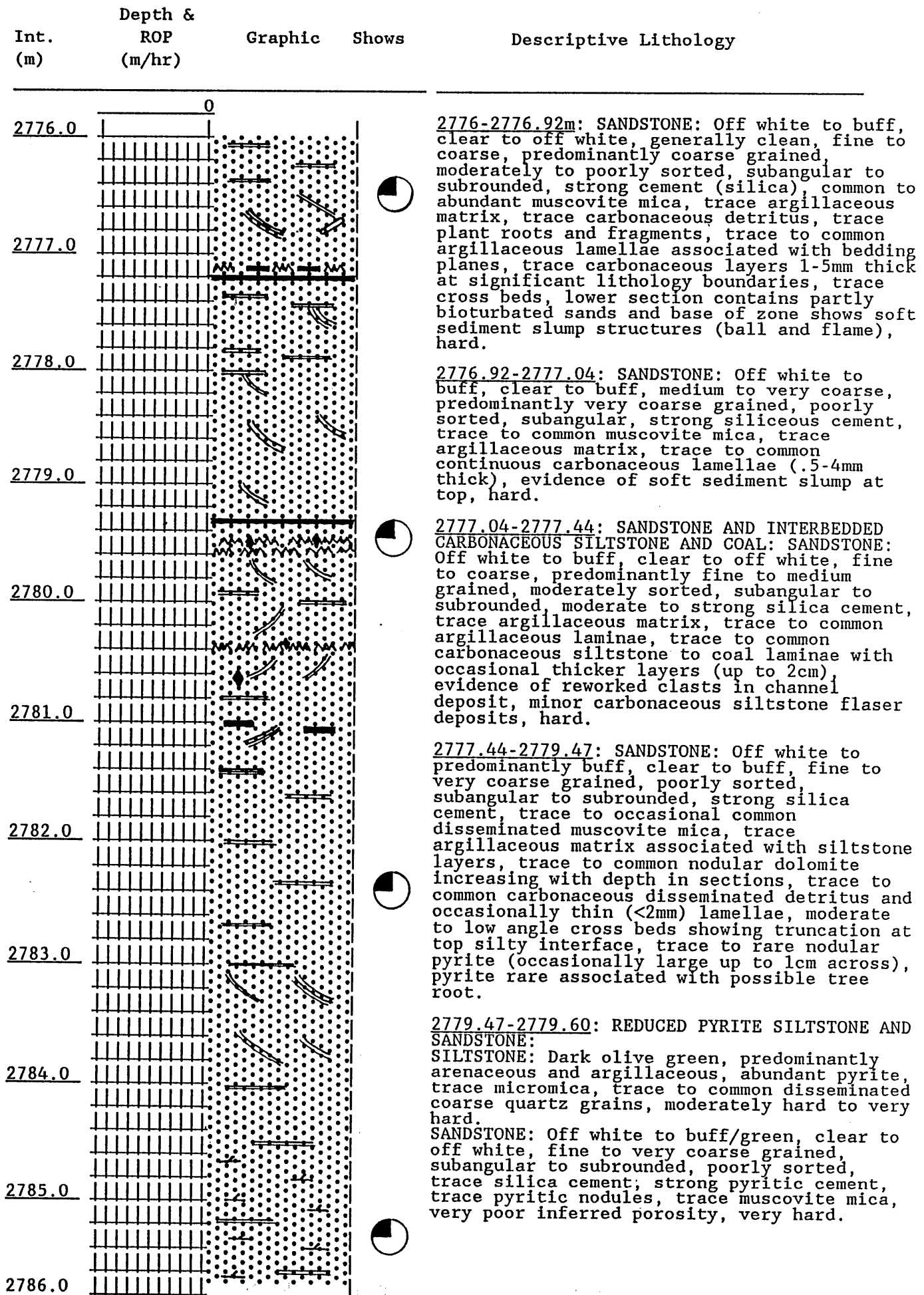
Cut : 18.5m

Bit Size : 97/8"

Bit Type : RC 476

Date : 11.3.89

Described by : A. Clare
G. Smith



Core No. 1

Well : Conger-1

Interval Cored : 2776m - 2794.5m

Recovered : 18.23m (98%)

Cut : 18.5m

Bit Size : 97/8"

Bit Type : RC 476

Date : 11.3.89

Described by : A. Clare
G. Smith

Int. (m)	Depth & ROP (m/hr)	Graphic Shows	Descriptive Lithology
2786.0			2779.60-2780.60: SANDSTONE: Off white to beige/buff, grains clear to buff, fine to very coarse, predominantly medium grained, poorly sorted, subangular to subrounded, strong silica cement, common muscovite mica, common disseminated pyrite (strong disseminated pyritic cement), common discontinuous carbonaceous lamellae, trace to common continuous thin carbonaceous to carbonaceous siltstone lamellae, trace to common crossbeds in structure, trace fining upwards sequence in crossbeds, moderate to poor inferred porosity.
2787.0			
2788.0			2780.60-2784.40: SANDSTONE: Off white to buff, clear to buff, fine to very coarse, predominantly medium grained, moderate to poorly sorted, subangular to subrounded, strong silica cement, no observable pyrite cement, common muscovite mica, common layers (and crossbeds of fining upwards and rare sands) of variable grain size, abundant silty laminations associated with crossbeds with strong argillaceous matrix within laminae, common carbonaceous siltstone to coal and carbonaceous lamellae associated with crossbed planes, common disseminated very fine carbonaceous debris, common very coarse sand horizons, towards base of zone abundant stacked 5-10cm thick fining upwards sequences, decreasing silty component with depth, hard.
2789.0			
2790.0			
2791.0			2784.40-2787.31: SANDSTONE: Off white to buff, clear to translucent, occasionally buff, fine to coarse, predominantly medium grained, moderately sorted, subangular to subrounded, silica cement, abundant disseminated nodules of dolomite, nodules occur as subspherical to elliptical, up to 15mm maximum diameter, common to occasionally abundant muscovite mica often in micaceous layers, trace argillaceous siltstone lamellae, trace carbonaceous and carbonaceous siltstone lamellae (discontinuous and continuous), tight, hard, very poor inferred porosity.
2792.0			
2793.0			2787.31-2788: MASSIVE SANDSTONE: SANDSTONE: Light grey, fine to medium, predominantly medium grained, poorly sorted, subangular to subrounded, weak moderate silica cement, very weak dolomitic cement, generally clean with trace light brown argillaceous matrix, trace muscovite flakes and lithic fragments, rare pyrite, firm to hard, fair to good visual porosity.
2794.0			2788-2789.72: VERY FINE SANDSTONE WITH VERY FINE SILTSTONE LAMINATIONS: SANDSTONE: Light grey, very fine to fine grained, well sorted, subangular to subrounded, abundant strong silica cement with slight dolomitic and sideritic cement, common light brown argillaceous matrix, minor micromica and micaceous partings, slightly carbonaceous, very hard to hard, tight to very poor visual porosity.
2795.0			

Core No. 1

Well : Conger-1

Interval Cored : 2776m - 2794.5m

Recovered : 18.23m (98%)

Cut : 18.5m

Bit Size : 97/8"

Bit Type : RC 476

Date : 11.3.89

Described by : A. Clare
G. Smith

Int. (m)	Depth & ROP (m/hr)	Graphic Shows	Descriptive Lithology
	0		
			2788-2789.72 (contd): SILTSTONE: Dark grey to black, moderate to very argillaceous, moderately arenaceous grading in parts to very fine sandstone, very micaceous with common micaceous partings, very thin planar and flaser bedding, very fine ripples and flame structures.
			2789.72-2790.65: MASSIVE SANDSTONE: SANDSTONE: Mottled light grey to light brown, medium to very coarse, predominantly coarse grained, poorly sorted, subangular, moderately strong silica cement, minor white to light cream argillaceous matrix, common nodular pyrite, common muscovite mica, abundant lithic fragments, trace discontinuous siltstone laminae, hard to very hard, very good visual porosity.
			2790.65-2792.79: VERY FINE SANDSTONE WITH VERY FINE SILTSTONE LAMINATIONS: SANDSTONE: As above (for interval 2788-2789.72). SILTSTONE: As above (for interval 2788-2789.72).
			2792.79-2794.23: PREDOMINANTLY MASSIVE SANDSTONE WITH RARE THINLY INTERBEDDED SILTSTONE: SANDSTONE: Light grey, fine to coarse, predominantly medium grained, angular to subangular, well cemented with silica and trace sideritic cement, common off white to light grey argillaceous matrix, minor lithic fragments, common muscovite mica flakes, moderately hard to very hard, brittle, very poor visual porosity, minor crossbedding. SILTSTONE: As above, planar thinly interbedded siltstone.
			2776-2794.23: FLUORESCENCE: Sandstones show trace to 40%, dull yellow/green patchy to occasionally spotty fluorescence, very slow diffuse faint yellow cut, trace dull yellow thin ring residue.

APPENDIX 3

CONGER-1

SIDEWALL CORE DESCRIPTIONS

<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
1	2943.5	8	B	<p>INTERBEDDED SILTSTONE AND SANDSTONE</p> <p><u>SILTSTONE</u>: Very dark grey/black, very argillaceous, common micromicaceous flecks, minor carbonaceous material, hard to moderately hard, subfissile to splintery.</p> <p><u>SANDSTONE</u>: Light grey to off white, very fine to fine grained, moderately well sorted, subangular to subrounded, weak siliceous cement, abundant white argillaceous matrix, trace lithic fragments, friable, firm, poor visual porosity, no fluorescence. GAS: 292/59/17/tr</p>
2	2934	10	B	<p>SAMPLE IS VERY BADLY CONTAMINATED WITH MUD</p> <p><u>SANDSTONE</u>: light grey, very fine to fine grained, moderately well to well sorted, subrounded, very weak to absent siliceous cement, abundant light grey argillaceous matrix (mud fines?), soft, friable, fair inferred porosity, trace very dull yellow fluorescence, very patchy, no cut, very faint yellow slow crush cut, trace residual ring. GAS: 122/26/34/TR</p>
3	2913	E	R	EMPTY BULLET.
4	2885	<8	B	<p>SAMPLE IS VERY BROKEN UP AND REPRESENTS MUD CAKE CAVINGS: NOT REPRESENTATIVE. GAS: 146/27/9</p>
5	2863.5	9	B	<p>SAMPLE BROKEN UP AND CONTAMINATED WITH MUD/MUD CAKE.</p> <p><u>SILTSTONE</u>: Very dark grey/brown, moderately argillaceous, very slightly calcareous, trace pyrite disseminated throughout, common micromicaceous and carbonaceous flecks, slightly arenaceous, moderately hard, subfissile. GAS: 325/38/9</p>
6	2860.5	B/E	R	BROKEN AND EMPTY BULLET.
7	2858.5	8	B	<p>SAMPLE BROKEN AND HEAVILY CONTAMINATED.</p> <p><u>SILTSTONE</u>: Dark brown, moderately argillaceous, common very fine sandstone grains, minor lithic fragments, very slightly calcareous, abundant micromicaceous flecks, trace carbonaceous flecks, trace dull orange mineral fluorescence, moderately hard, blocky. GAS: 341/48/13</p>
8	2841	B/E	R	BROKEN AND EMPTY BULLET.
9	2831.5	8	B	<p>SAMPLE BROKEN AND HEAVILY CONTAMINATED.</p> <p><u>SILTSTONE</u>: Very dark brown, very argillaceous, moderately carbonaceous with common coal detrital fragments, very slightly calcareous, slightly micromicaceous, slightly arenaceous, no fluorescence, hard, blocky. GAS: 162/11</p>

<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
10	2821	M	R	MUDCAKE WITH MINOR BLOCKY CAVINGS. NOT REPRESENTATIVE. (1 ¹ / ₂ " OF MUDCAKE)
11	2816	E	R	BULLET EMPTY.
12	2790	17	B	<u>SANDSTONE</u> : Off white to white, very fine to fine grained, well sorted, subrounded, weak siliceous and calcareous cement, abundant white argillaceous matrix, slightly micaceous, friable, soft, poor visual and inferred porosity, FLUORESCENCE: overall very dull yellow/green fluorescence, patchy, very slow diffuse faint yellow cut, trace ring residue. GAS: 227/32/TR
13	2771.0	E	R	BULLET EMPTY.
14	2753	8	B	<u>SILTSTONE</u> : Very dark brown, very argillaceous, slightly micromicaceous and microcarbonaceous, overall uniform texture, hard to moderately hard, blocky, no fluorescence. GAS: no gas
15	2742	17	B	<u>SILTSTONE</u> : Medium grey, very argillaceous, moderately arenaceous with abundant very fine quartz grains, slightly micromicaceous, soft, slightly sticky and dispersive, crumbly. GAS: 114/48/27/TR
16	2728	8	B	<u>SILTSTONE</u> : Very dark grey/brown, moderately argillaceous, slightly arenaceous, common microcarbonaceous fragments, uniform texture, moderate to very hard, subfissile to splintery. GAS: 438/215/141/28
17	2704.0	B/E	R	BULLET EMPTY.
18	2673.0	17	B	<u>SILTSTONE</u> : Medium grey, very argillaceous, slightly calcareous, minor coal and carbonaceous detritus, micromicaceous, slightly swelling, soft to firm, crumbly. GAS: 203/102/71/22
19	2641.0	M	R	BULLET MISSING.
20	2626	E	R	BULLET MISSING.
21	2608	17	B	<u>SILTSTONE</u> : Medium to dark brown, very argillaceous, slightly arenaceous, microcarbonaceous fragments and laminae, slightly micromicaceous, firm, blocky. GAS: 374/86/35/TR
22	2576	24.6	B	<u>SILTSTONE</u> : Medium brown, moderately argillaceous, slightly arenaceous with common very fine sandstone quartz grains, slightly micromicaceous, very slightly calcareous, firm, blocky. GAS: 244/231/159/38
23	2542	33	B	<u>CLAYSTONE</u> : Medium grey/brown, moderately silty, rare very fine quartz grains, microcarbonaceous fragments, soft, slightly swelling, crumbly. GAS: 97/43/27/-

<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
24	2509.5	M	R	BULLET MISSING.
25	2454	25	B	<u>SILTSTONE</u> : Mottled light grey to light grey/brown and white, moderately argillaceous, commonly arenaceous with thin laminae of white very fine grained sandstone, micromicaceous and microcarbonaceous flecks, grading to very silty fine grained sandstone in part, firm to soft, blocky. GAS: 81/27/11/-
26	2420	8	B	<u>SILTSTONE</u> : Medium to dark grey, very argillaceous, common micromicaceous flecks, slightly arenaceous, slightly swelling, soft to firm. GAS: 65/11/TR
27	2408.5	10	B	<u>SILTSTONE</u> : Medium brown, very argillaceous with common coal and carbonaceous fragments, slightly arenaceous, trace micromicaceous, flecks, very slightly calcareous, firm, crumbly. GAS: 16/6/TR
28	2376	33	B	<u>SILTSTONE</u> : Medium to dark grey, very argillaceous, grading to claystone, very slightly arenaceous, common mica and micromicaceous flecks, soft to firm, blocky to crumbly. GAS: 179/64/44/10
29	2346	25	B	<u>SILTSTONE</u> : Medium to dark grey/brown, abundantly argillaceous, grading to claystone, uniform texture, firm, blocky. GAS: 81/21/9/TR
30	2333	24	B	<u>SILTSTONE/CLAYSTONE</u> : Very dark brown, very argillaceous, abundant micromicaceous flecks, trace arenaceous grains, uniform texture, homogeneous, firm to moderately hard, blocky. GAS: 211/75/53/27
31	2314.0	33	B	<u>SILTSTONE</u> : Very dark brown to brown/grey, argillaceous and arenaceous, trace carbonaceous matrix, trace to common quartz grains (very fine), trace micromicaceous flecks, trace carbonaceous material, blocky to subfissile, firm, no fluorescence. GAS: 422/129/57/tr
32	2295.5	M	R	MISSING BULLET.
33	2280.0	34	B	<u>SILTSTONE</u> : WITH VERY WEAK LAMINATIONS: Very dark brown, argillaceous and arenaceous, trace carbonaceous material, abundant very fine quartz grains (siltstone grading to very fine argillaceous sandstone), common micromicaceous flecks, trace to absent carbonaceous debris, moderate to strong swelling clays, friable, firm, no fluorescence. GAS: 520/193/102/44/-
34	2262	32	B	INTERBEDDED SILTSTONE WITH VERY FINE SANDSTONE:

<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
(contd) 34	2262	33	B	<p><u>SILTSTONE</u>: Very dark grey/brown, predominantly argillaceous with common carbonaceous material, trace to common very fine quartz grains, trace micromicaceous, trace carbonaceous detritus, firm, strong swelling clays, friable, laminated.</p> <p><u>SANDSTONE</u>: Light to medium grey, predominantly arenaceous, very fine to silty, very well sorted, very fine grains subrounded, trace siliceous cement, abundant arenaceous matrix, trace micromicaceous, strongly interlaminated with siltstone (above description), moderate swelling clays, firm, friable, very poor inferred porosity, no fluorescence.</p> <p>GAS: 780/300/133/22/-</p>
35	2251	35	B	<p>ARENACEOUS SILTSTONE WITH FINE CARBONACEOUS DISSEMINATED LAMINAE:</p> <p><u>SILTSTONE</u>: Light grey to grey/cream, arenaceous with minor carbonaceous matrix, trace argillaceous and trace carbonaceous plant debris, non-swelling clays, firm, friable.</p> <p>GAS: 130/43/22/-/-</p>
36	2232	M	R	MISSING BULLET.
37	2215	33	B	<p><u>SILTSTONE</u>: Light to medium grey, subequal argillaceous to arenaceous mix with minor carbonaceous, trace fine quartz grains and carbonaceous debris, subfissile, weak to moderate swelling clays, firm, no fluorescence.</p> <p>GAS: 114/32/13/-/-</p>
38	2198	40	B	<p>VERY FINE SANDSTONE WITH MINOR INTERBEDDED SILTSTONE:</p> <p><u>SANDSTONE</u>: Light to medium grey, very fine grading to siltstone, well sorted, subrounded to rounded, trace calcareous cement, trace argillaceous matrix, trace micromicaceous, trace carbonaceous disseminated laminae, trace pyrite, firm, moderate to poor visual porosity, no fluorescence.</p> <p><u>SILTSTONE</u>: Very dark grey/brown, argillaceous to arenaceous and minor carbonaceous, trace carbonaceous debris and micromicaceous, subfissile to blocky, moderately swelling clay, firm, no fluorescence.</p> <p>GAS: 17-TR/TR/-/-</p>
39	2166.5	50	B	<p><u>SILTSTONE</u>: Very dark brown, argillaceous to arenaceous and slightly carbonaceous, trace micromicaceous, trace very fine quartz grains, very strong rapid swelling clays, subfissile to friable, firm, no fluorescence.</p> <p>GAS: 227/59/18/-/-</p>
40	2142	35	B	<p><u>SILTSTONE</u>: Medium to light grey, predominantly arenaceous with minor argillaceous and carbonaceous debris, trace to common very fine quartz grains, trace micromicaceous, very minor trace pyrite, strong swelling clays, subfissile, firm trace mineral fluorescence.</p> <p>GAS: 195/32/18/-/-</p>

<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
41	2110	35	B	<u>SILTSTONE</u> : Medium to dark green/brown, arenaceous to argillaceous with minor carbonaceous matrix, trace micromicaceous, trace quartz grains, trace to common calcareous cement, trace dolomitic cement, strong to moderate swelling clays, friable to blocky, firm to moderately hard, no fluorescence. GAS: 49/43/27/-/-
42	2090	40	B	<u>SILTSTONE</u> : Very dark grey/brown to black/brown, predominantly argillaceous and arenaceous with abundant carbonaceous, common micromicaceous, trace fine quartz grains, no observable carbonaceous debris, weak to no swelling clay, no calcareous cement, blocky, firm to moderately hard, no fluorescence. GAS: 706/507/371/149/-
43	2057.6	32	B	<u>SANDSTONE</u> : Pale brown to cream, very fine, very well sorted, subrounded to rounded, trace siliceous cement, trace argillaceous matrix, very weak swelling clay, common fine mica, very minor trace carbonaceous debris, firm, very poor visual porosity, no fluorescence. GAS: 122/16/9/-/-
44	2031.2	32	B	<u>SILTSTONE</u> : Pale grey to brown, predominantly arenaceous with abundant argillaceous and very minor carbonaceous, very minor trace carbonaceous, trace to common micromicaceous, very fine interlaminae of pale grey and pale grey/brown siltstone, subfissile to blocky, no swelling clays, firm to moderately hard, no fluorescence. GAS: 97/32/18/TR/-
45	2011	50	B	VERY FINE SANDSTONE WITH ASSOCIATED COAL LAYER, SOME INTER-LAMINATION: <u>SANDSTONE</u> : Off white, very fine, very well sorted, subrounded, trace siliceous cement, no calcareous cement, trace carbonaceous debris matrix, trace mica (fine), firm, poor visual porosity, no fluorescence. <u>COAL</u> : Black to very dark black/brown, dull, bituminous, trace to common siltstone/sandstone interlaminae, blocky to uneven, firm to moderately hard, very minor trace amber fluorescence.
46	1997.8	33	B	<u>SILTSTONE</u> : Very dark grey/brown, predominantly argillaceous with minor arenaceous and carbonaceous, trace micromicaceous, very fine medium and dark grey/brown silty interlaminae, blocky, firm to moderately hard, no fluorescence. GAS: 528/418/327/143/-
47	1960	25	B	<u>SILTSTONE</u> : Medium to dark grey/brown, predominantly argillaceous with minor arenaceous laminae, trace fine quartz grains, trace micromicaceous, blocky, moderately swelling clays, firm to moderately hard. GAS: 544/451/398/143/65
48	1940.4	M	R	MISSING BULLET.
49	1924	M	R	MISSING BULLET.

<u>NO.</u>	<u>Depth</u> (m)	<u>Rec.</u> (mm)	<u>Bought</u> <u>Reject</u>	<u>Description</u>
50	1891.8	32	B	<u>SILTSTONE/CLAYSTONE</u> : Medium to dark green/brown, predominantly argillaceous with very minor carbonaceous and arenaceous, trace micromicaceous, very minor trace carbonaceous debris, non-swelling clays, blocky to uneven, firm to moderately hard, no fluorescence. GAS: 195/247/287/165/-
51	1865	24	B	<u>SILTSTONE/CLAYSTONE</u> : Medium to dark green/brown, argillaceous with very minor arenaceous and carbonaceous, trace to common micromicaceous, trace quartz grains (very minor), weak to moderately swelling clay, blocky to uneven, firm, no fluorescence. GAS: 179/139/111/27/-
52	1860	25	B	<u>CLAYSTONE</u> : Very dark brown, argillaceous, trace micromicaceous, trace carbonaceous detritus, non-swelling clay, blocky, firm to moderately hard, no fluorescence. GAS: 763/451/44/88/-
53	1833.5	8	B	<u>LIMESTONE/CLAYSTONE</u> : Medium grey, calcareous claystone, calcisiltite to calcilutite, trace fossils (possible foram), very poor porosity, very blocky and fissile, fractured fragments, blocky, no fluorescence (?cavings?). GAS: 682/11/9/11/-
54	1828.8	M	R	MISSING BULLET.
55	1826	40	B	<u>SILTSTONE/CLAYSTONE</u> : Dark green/brown, argillaceous with abundant arenaceous, trace micromicaceous, trace fine quartz grains, abundant disseminated slightly nodular glauconite (green), subfissile to blocky, (<u>strong calcareous cement and fast swelling clay</u>), no fluorescence. GAS: 106/86/154/110/-
56	1823	M	R	MISSING BULLET.
57	1819	50	B	<u>SILTSTONE</u> : Very dark brown/grey, argillaceous and arenaceous, trace glauconite, trace micromicaceous, trace siderite, subfissile, firm, no fluorescence. GAS: 8/7/8/-/-
58	1816	40	B	<u>SILTSTONE</u> : Very dark brown/grey, argillaceous and minor arenaceous, very minor trace glauconite, trace to sideritic, trace to common micromicaceous, very strong rapid swelling clays, blocky to subfissile, firm, no fluorescence. GAS: 196/75/123/78/-
59	1810.5	M	R	MISSING BULLET.
60	1800	65	B	<u>LIMESTONE/CLAYSTONE</u> : Medium grey, calcareous claystone, calcilutite, trace micromicaceous, trace forams, very poor visual porosity, no fluorescence.

**APPENDIX 4
VELOCITY SURVEY
REPORT**

**THE SCHLUMBERGER REPORT
SONIC CALIBRATION
AND GEOGRAM
PROCESSING REPORT**

CONGER #1

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