

TIGHT HOLE

AMENDED

SIDE ONE

STATE CORPORATION COMMISSION OF KANSAS OIL & GAS CONSERVATION DIVISION

WELL COMPLETION OR RECOMPLETION FORM ACO-1 WELL HISTORY

DESCRIPTION OF WELL AND LEASE

Operator: License # 5171
 Name TXO Production Corp.
 Address 1800 Lincoln Center Bldg.
 1660 Lincoln Street
 City/State/Zip Denver, CO 80264

Purchaser None

Operator Contact Person Frank D. Tsuru
 Phone (303) 861-4246

Contractor: License # 6033
 Name Murfin Drilling Company

Wellsite Geologist Richard Bacon
 Phone

Designate Type of Completion
 New Well Re-Entry Workover
 Oil SWD Temp Abd
 Gas Inj Delayed Comp.
 Dry

If OWWO: old well info as follows:
 Operator
 Well Name
 Comp. Date Old Total Depth

WELL HISTORY

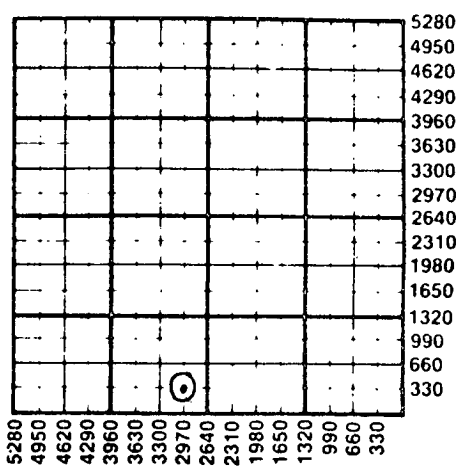
Drilling Method:
 Mud Rotary Air Rotary Cable

12/23/85	1/1/86	1/1/86
Spud Date	Date Reached TD	Completion Date
5260'		
Total Depth	PBTD	

Amount of Surface Pipe Set and Cemented at 384' feet
 Multiple Stage Cementing Collar Used? Yes No
 If yes, show depth set.....feet
 if alternate 2 completion, cement circulated from.....feet depth to.....w/.....SX cmt

API NO. 15-199-20,063 0000
 County Wallace
 SE SE SW Sec. 32 Twp. 15S Rge. 42 East West
 330 Ft North from Southeast Corner of Section
 2970 Ft West from Southeast Corner of Section
 (Note: Locate well in section plat below)
 Lease Name Bergquist "A" Well # 1
 Field Name SW Stockholm Sw
 Producing Formation Morrow T24
 Elevation: Ground 3888 KB 3898

Section Plat



WATER SUPPLY INFORMATION
 Disposition of Produced Water: Disposal Repressuring
 Docket #

Questions on this portion of the ACO-1 call:
 Water Resources Board (913) 296-3717

Source of Water:
 Division of Water Resources Permit #
 Groundwater.....Ft North from Southeast Corner (Well)Ft West from Southeast Corner of Sec Twp Rge East West
 Surface Water.....Ft North from Southeast Corner (Stream, pond etc).....Ft West from Southeast Corner Sec Twp Rge East West
 Other (explain)..... (purchased from city, R.W.D. #)

INSTRUCTIONS: This form shall be completed in duplicate and filed with the Kansas Corporation Commission, 200 Colorado Derby Building, Wichita, Kansas 67202, within 90 days after completion or recompletion of any well. Rule 82-3-130 and 82-3-107 apply.
 Information on side two of this form will be held confidential for a period of 12 months if requested in writing and submitted with the form. See rule 82-3-107 for confidentiality in excess of 12 months.
 One copy of all wireline logs and drillers time log shall be attached with this form. Submit CP-4 form with all plugged wells. Submit CP-111 form with all temporarily abandoned wells.

All requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Signature Frank D. Tsuru
 Title Drilling & Production Engineer Date 2/10/86

Subscribed and sworn to before me this 10 day of Feb 1986
 Notary Public Nada J. Branson
 Date Commission Expires Dec 14, 1986

K.C.C. OFFICE USE ONLY

Letter of Confidentiality Attached
 Wireline Log Received
 Drillers Timelog Received

Distribution
 KCC SWD/Rep NGPA
 KGS Plug Other (Specify)

SIDE TWO

Operator Name TXO Production Corp. Lease Name Bergquist "A" Well # 1

Sec. 32 Twp. 15S Rge. 42 East West County Wallace

WELL LOG

INSTRUCTIONS: Show important tops and base of formations penetrated. Detail all cores. Report all drill stem tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface during test. Attach extra sheet if more space is needed. Attach copy of log.

Drill Stem Tests Taken Yes No
 Samples Sent to Geological Survey Yes No
 Cores Taken Yes No

Formation Description
 Log Sample

DST #1: IFP, TO w/ a very weak blow dead in 6 min. FFP, no blow. Rec 10' drlg. mud. IHHP: 2459#, (30 min), IFP 3#-3#, (60 min) ISIP 983#, (60 min) FFP 3#-3#, (120 min) FSIP 741#, FHHP 2459#. BHSC: 2240 cc drlg mud.

Name	Top	Bottom
Stone Corral	2760	
Foraker	3561	
Topeka	3907	
Heebner	4129	
Lansing	4192	
Marmaton	4625	
Ft. Scott	4699	
Cherokee	4750	
Atoka	4877	
Morrow	5036	
Johannes Sd.	5122	
Lower Morrow Ls	5133	
Mississippian	5181	

RELEASED

MAY 28 1987

FROM CONFIDENTIAL

CASING RECORD New Used
 Report all strings set-conductor, surface, intermediate, production, etc.

Purpose of String	Size Hole Drilled	Size Casing Set (in O.D.)	Weight Lbs/Ft.	Setting Depth	Type of Cement	#Sacks Used	Type and Percent Additives
Surface	12 1/2"	8-5/8"	24#	384'	Cl. "H"	300	3% CaCl ₂

PERFORATION RECORD

Shots Per Foot	Specify Footage of Each Interval Perforated	Acid, Fracture, Shot, Cement Squeeze Record (Amount and Kind of Material Used)	Depth

TUBING RECORD

Size	Set At	Packer at	Liner Run	<input type="checkbox"/> Yes <input type="checkbox"/> No

Date of First Production: Well D & A'd
 Producing Method: Flowing Pumping Gas Lift Other (explain.....)

Oil	Gas	Water	Gas-Oil Ratio	Gravity
Bbls	MCF	Bbls	CFPB	

Estimated Production Per 24 Hours

METHOD OF COMPLETION

Production Interval

Disposition of gas: Vented Open Hole Perforation
 Sold Other (Specify)
 Used on Lease Dually Completed
 Commingled

HALLIBURTON SERVICES JOB SUMMARY

HALLIBURTON
DIVISION

HALLIBURTON
LOCATION

BILLED ON
TICKET NO.

FORM 2025

WELL DATA

FIELD _____ SEC. 32 TWP. 15 RNG. 42 COUNTY Wallace STATE KY

FORMATION NAME _____ TYPE _____
 FORMATION THICKNESS _____ FROM _____ TO _____
 INITIAL PROD: OIL _____ BPD. WATER _____ BPD. GAS _____ MCFD _____
 PRESENT PROD: OIL _____ BPD. WATER _____ BPD. GAS _____ MCFD _____
 COMPLETION DATE _____ MUD TYPE _____ MUD WT. _____
 PACKER TYPE _____ SET AT _____
 BOTTOM HOLE TEMP. _____ PRESSURE _____
 MISC. DATA _____ TOTAL DEPTH _____

	NEW USED	WEIGHT	SIZE	FROM	TO	MAXIMUM PSI ALLOWABLE
CASING		24	3 1/2	800	334	
LINER						
TUBING						
OPEN HOLE				334	5260	SHOTS/FT.
PERFORATIONS						
PERFORATIONS						
PERFORATIONS						

JOB DATA

TOOLS AND ACCESSORIES

TYPE AND SIZE	QTY.	MAKE
FLOAT COLLAR		
FLOAT SHOE		
GUIDE SHOE		
CENTRALIZERS		
BOTTOM PLUG		
TOP PLUG	1	HWC
HEAD		
PACKER		
OTHER		

CALLED OUT	ON LOCATION	JOB STARTED	JOB COMPLETED
DATE <u>1-2-55</u>	DATE <u>1-2-55</u>	DATE <u>1-2-55</u>	DATE _____
TIME <u>2:30</u>	TIME <u>0:30</u>	TIME <u>00:00</u>	TIME _____

PERSONNEL AND SERVICE UNITS

NAME	UNIT NO. & TYPE	LOCATION
<u>D. S. KROGER</u>	<u>54407</u> P.O.	<u>Lama</u>
<u>S. HERRERA</u>	<u>1515-5376</u> <u>6170-3</u>	<u>"</u>
<u>K. L. LUGER</u>	<u>126-5070</u> B.T.	<u>"</u>

MATERIALS

TREAT. FLUID _____ DENSITY _____ LB/GAL. API _____
 DISPL. FLUID _____ DENSITY _____ LB/GAL. API _____
 PROP. TYPE _____ SIZE _____ LB. _____
 PROP. TYPE _____ SIZE _____ LB. _____
 ACID TYPE _____ GAL. _____ % _____
 ACID TYPE _____ GAL. _____ % _____
 ACID TYPE _____ GAL. _____ % _____
 SURFACTANT TYPE _____ GAL. _____ IN _____
 NE AGENT TYPE _____ GAL. _____ IN _____
 FLUID LOSS ADD. TYPE _____ GAL.-LB. _____ IN _____
 GELLING AGENT TYPE _____ GAL.-LB. _____ IN _____
 FRIC. RED. AGENT TYPE _____ GAL.-LB. _____ IN _____
 BREAKER TYPE _____ GAL.-LB. _____ IN _____
 BLOCKING AGENT TYPE _____ GAL.-LB. _____ IN _____
 PERFFAC BALLS TYPE _____ QTY. _____
 OTHER _____
 OTHER _____

DEPARTMENT Unit
 DESCRIPTION OF JOB "See Job Log"
 JOB DONE THRU: TUBING CASING ANNULUS TBC./ANN.
 CUSTOMER REPRESENTATIVE X Jerry McGee
 HALLIBURTON OPERATOR R. D. Schindler COPIES REQUESTED 1

CEMENT DATA

STAGE	NUMBER OF SACKS	TYPE	API CLASS	BRAND	BULK SACKED	ADDITIVES	YIELD CU.FT./SK.	MIXED LBS./GAL.
1	50	6070	II	SW	3	5% Gel	105	13.1
2	50	602						
3	40			11				
4	40							
5	40							

PRESSURES IN PSI

SUMMARY

VOLUMES

CIRCULATING _____ DISPLACEMENT _____ PRESLUSH: BBL-GAL. _____ TYPE _____
 BREAKDOWN _____ MAXIMUM _____ LOAD & BKDN: BBL-GAL. _____ PAD: BBL-GAL. _____
 AVERAGE _____ FRACTURE GRADIENT _____ TREATMENT: BBL-GAL. _____ DISPL: BBL-GAL. _____
 SHUT-IN: INSTANT _____ 5-MIN. _____ 15-MIN. _____ CEMENT SLURRY: BBL-GAL. 38
 TOTAL VOLUME: BBL-GAL. _____
 ORDERED _____ AVAILABLE _____ USED _____ REMARKS _____
 AVERAGE RATES IN BPM _____
 TREATING _____ DISPL. _____ OVERALL _____
 CEMENT LEFT IN PIPE _____
 FEET _____ REASON _____

CUSTOMER

CUSTOMER: TXO Production
 LEASE: Beagwood
 WELL NO.: A-1
 JOB TYPE: C.T.A.
 DATE: 12-2-55

HALLIBURTON SERVICES
JOB LOG

WELL NO. 1-1 LEASE DeWright TICKET NO. 17311
 CUSTOMER TAC Production PAGE NO. _____
 JOB TYPE M.T.A. DATE 1-3-86

FORM 2013 R-2

CHART NO.	TIME	RATE (BPM)	VOLUME (BBL) (GAL)	PUMPS		PRESSURE (PSI)		DESCRIPTION OF OPERATION AND MATERIALS
				T	C	TUBING	CASING	
	02:30							Called Out
	01:30							ON Location
	01:30							Rig WAS running Drill Pipe in hole
	02:00							CONFIDENTIAL started laying down drill pipe
	06:00							1 st Plug 30 SKS AT 2770'
1	06:02	5	10			200		110 mud
2	06:04	5				200		Start mixing cont. 60-90 lbs
3	06:06	5	11.5			250		finish cont.
4	06:07	5				200		Start Dipl. 12740
5	06:15	5	35			250		Finished Dipl.
	06:20							Rig laying down drill pipe
								2 nd Plug 30 SKS AT 1600'
6	07:02	5	10			150		Start 110 mud
7	07:04	5				200		Start mixing cont. 60-90 lbs
8	07:06	5	11.5			200		finish cont.
9	07:07	3				200		Start Dipl.
10	07:15	5	15			150		Finished Dipl. mud
	07:20							Rig laying down drill pipe
								3 rd Plug 40 SKS AT 700'
11	07:38	5	10			100		Start 110 mud
12	07:40	5				150		Start mixing cont. 60-90 lbs
13	07:42	-	10			150		finish cont.
	07:43					150		Start Dipl.
14	07:44	5	4			150		Finished Dipl. mud
	07:50							Rig laying down drill pipe
								4 th Plug 40 SKS AT 394'
15	08:07	5	17			100		Start 110 mud
16	08:09	5				100		Start cont.
17	08:11	5	1			50		finish cont.
18	08:13	-	3			50		finish cont.
								2 nd Plug 10 SKS AT 40'
								Start mixing cont.
			3.2					finish cont.
								6 th & 7 th Plugs 5 SKS EA IN MUD
								Start cont.
			3.2					finish cont.

PL 1
PL 2
PL 3



WORK ORDER CONTRACT AND PRE-TREATMENT DATA

FORM 1908 R-4

A Division of Halliburton Company DUNCAN, OKLAHOMA 73536

ATTACH TO INVOICE & TICKET NO. 15311

DISTRICT Libby, W

DATE 1-3-86

TO: HALLIBURTON SERVICES YOU ARE HEREBY REQUESTED TO FURNISH EQUIPMENT AND SERVICEMEN TO DELIVER AND OPERATE

THE SAME AS AN INDEPENDENT CONTRACTOR TO: PRO Production

AND DELIVER AND SELL PRODUCTS, SUPPLIES, AND MATERIALS FOR THE PURPOSE OF SERVICING (CUSTOMER)

WELL NO. 4-1 LEASE Beegant SEC. 32 TWP. 15 RANGE 42

FIELD COUNTY WALLACE STATE KS OWNED BY CONFIDENTIAL

THE FOLLOWING INFORMATION WAS FURNISHED BY THE CUSTOMER OR HIS AGENT

FORMATION NAME TYPE
FORMATION THICKNESS FROM TO
PACKER: TYPE SET AT
TOTAL DEPTH MUD WEIGHT
BORE HOLE
INITIAL PROD: OIL BPD, H2O BPD, GAS MCF
PRESENT PROD: OIL BPD, H2O BPD, GAS MCF

Table with columns: NEW USED, WEIGHT, SIZE, FROM, TO, MAX. ALLOW. P.S.I., SHOTS/FT. Rows include CASING, LINER, TUBING, OPEN HOLE, and PERFORATIONS.

PREVIOUS TREATMENT: DATE TYPE MATERIALS

TREATMENT INSTRUCTIONS: TREAT THRU TUBING ANNULUS CASING TUBING/ANNULUS HYDRAULIC HORSEPOWER ORDERED

Plug to Annulus - 1st Plug 50 SKS 60-40 Puz AT 2770', 2nd Plug 50' SKS AT 1600', 3rd Plug 40 SKS AT 700', 4th Plug 40 SKS AT 354', 5th Plug 11 SKS AT 40', 6th Plug 5 SKS in Part 1160', 7th Plug 5 SKS in Annulus Hole

CUSTOMER OR HIS AGENT WARRANTS THE WELL IS IN PROPER CONDITION TO RECEIVE THE PRODUCTS, SUPPLIES, MATERIALS, AND SERVICES

THIS CONTRACT MUST BE SIGNED BEFORE WORK IS COMMENCED

- 1. The customer shall be responsible for... 2. Halliburton shall be responsible for... 3. Customer shall be responsible for... 4. Halliburton shall be responsible for... 5. Halliburton shall be responsible for... 6. Halliburton shall be responsible for... 7. Halliburton shall be responsible for... 8. Halliburton shall be responsible for... 9. Halliburton shall be responsible for... 10. Halliburton shall be responsible for...

WARRANTIES: THE SERVICES AND MATERIALS FURNISHED BY HALLIBURTON ARE SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT AND THE CUSTOMER'S OBLIGATION TO PAY FOR SUCH SERVICES AND MATERIALS...

FORCE MAJEURE: In the event of a force majeure situation, the contract shall be terminated and the customer shall be responsible for the payment of the amount of the contract...

I HAVE READ AND UNDERSTAND THIS CONTRACT AND REPRESENT THAT I AM AUTHORIZED TO SIGN THE SAME AS CUSTOMER'S AGENT.

SIGNED: Bill Wilson CUSTOMER

DATE: 1-3-86

TIME: 1:07 P.M.

We certify that the Fair Labor Standards Act of 1938, as amended, has been complied with in the production of goods and/or with respect to services furnished under this contract.

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TXO PRODUCTION CORP.
BERGQUIST "A" #1
SWSESW SEC. 32
T15S R42W
WALLACE COUNTY
KANSAS

MAR 03 1985

WALLACE COUNTY SURVEY
WALLACE COUNTY

MEMPHIS
STATE GEOLOGICAL COMMISSION

FEB 20 1985

CONSERVATION DIVISION
WALLACE, KANSAS

RICHARD E. BACON
GEOLOGIST

SUMMARY AND CONCLUSIONS

CONFIDENTIAL

THE BERGQUIST "A" #1 WAS DRILLED TO A DRILLERS DEPTH OF 5260' SUBSEA -1362', LOGGING DEPTH WAS 5267' -1369'. THE PRIMARY OBJECTIVE WAS THE JOHANNES SAND WITH POSSIBLE SECONDARY POTENTIAL IN THE LOWER STOCKHOLM SAND. BOTH SANDS ARE LOWER MORROW MEMBERS.

THE JOHANNES SAND CAME IN AT 5122' -1224'. THIS 5' NET INTERVAL WAS A WHITE, SLIGHTLY LIGHT TAN, VERY FINE TO FINE GRAIN, SUBROUND TO ROUND, FIRM TO HARD, CALCAREOUS TO SILICEOUS, WELL SORTED, SAND WITH TRACES OF GLAUCONITE AND BIOTITE.

THE CUTTINGS SAMPLES DISPLAYED TRACES OF AN EVEN, BRIGHT, YELLOW GREEN FLUORESCENCE, GIVING AN IMMEDIATE, BRIGHT, MILKY YELLOW STREAMING, LEAVING AN EVEN, BRIGHT, YELLOW GREEN RING.

LOG CALCULATIONS GAVE AN AVERAGE POROSITY OF 14%, AN AVERAGE RESISTIVITY OF 14 OHMS AND, USING A .035 R_w, A WATER SATURATION OF 36%. THE THINNESS OF THE INTERVAL RAISED QUESTIONS OF PRODUCTION POTENTIAL. HENCE, A DST WAS RUN OVER THE INTERVAL OF 5126-5124'. REFER TO DST REPORT, BUT THE PRESSURES AND RECOVERY PRECLUDED RUNNING PIPE.

THE BERGQUIST "A" #1 WAS PLUGGED AND ABANDONED ACCORDING TO STATE REGULATIONS.

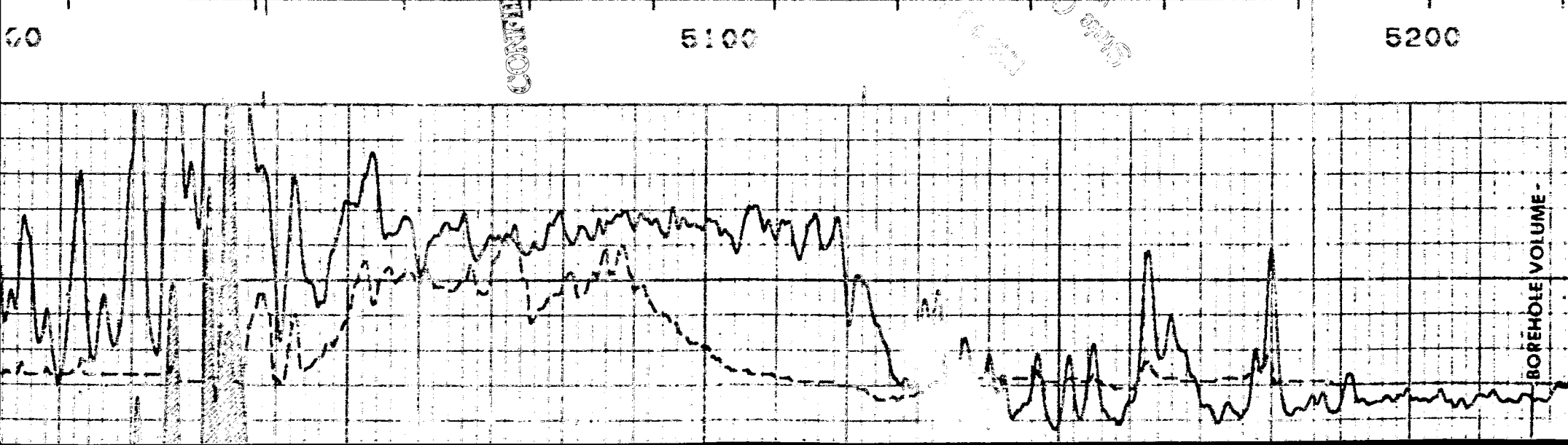
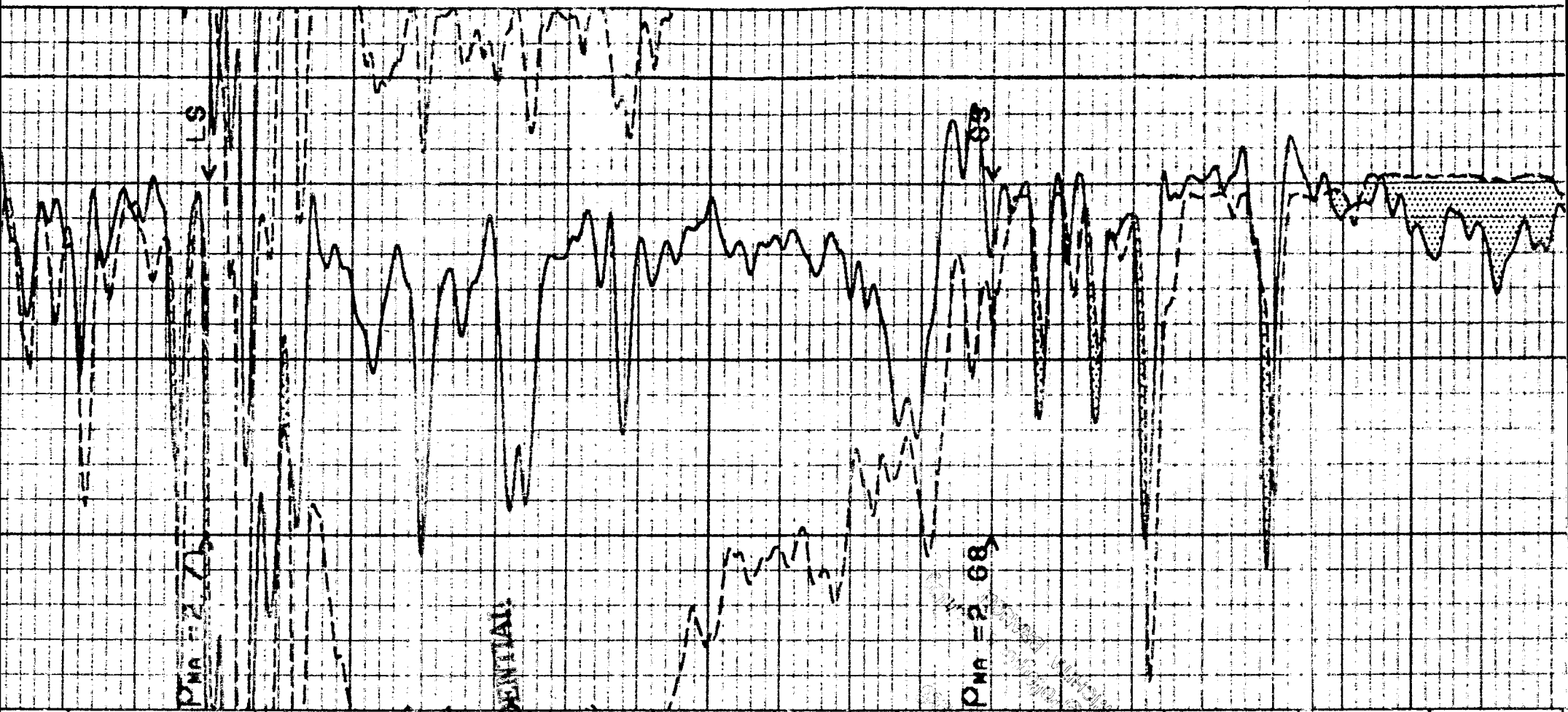
NOV 03 1964
DICK QUINN
MARTIN LUTHER KING

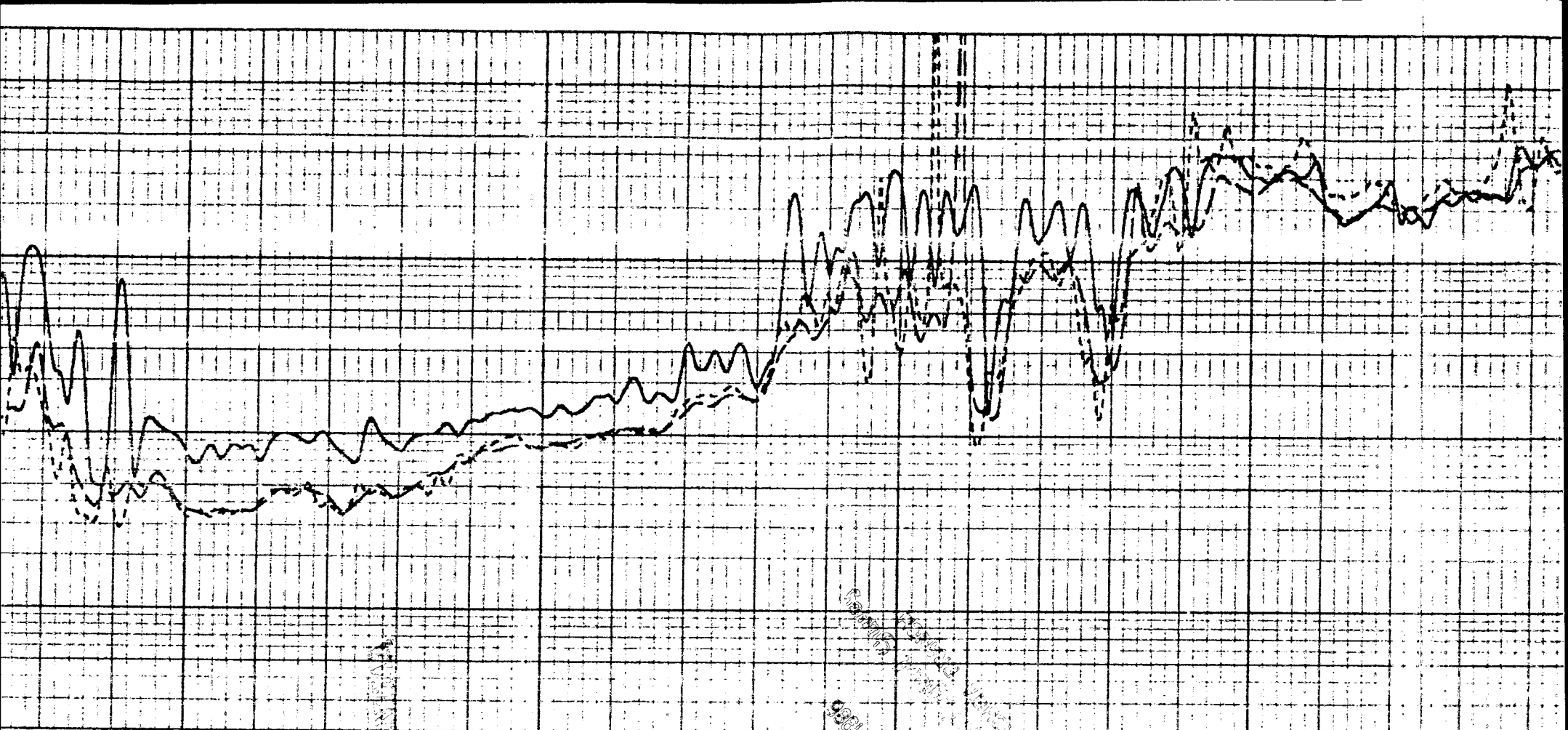
LITHOLOGIC TOPS

	BERGQUIST "A" #1	EDSALL "F" #9
STONE CORRAL	2760 +1158	2750 +1139
FORAKER	3565 +333	3560 +328
TOPEKA	3907 -9	3898 -10
HEEBNER	4129 -231	4118 -230
LANSING	4232 -334	4216 -328
MARMATON	4619 -721	4604 -716
FT. SCOTT	4708 -810	4688 -800
CHEROKEE	4751 -853	4728 -840
ATOKA	4877 -979	4855 -967
MORROW	5048 -1150	5015 -1127
JOHANNES SAND	5122 -1224	5092 -1204
LOWER LIME	5134 -1236	5130 -1242
MISSISSIPPIAN	5192 -1294	5173 -1285

MAR 03 1956

State Geological Survey
MICHIGAN LANSING

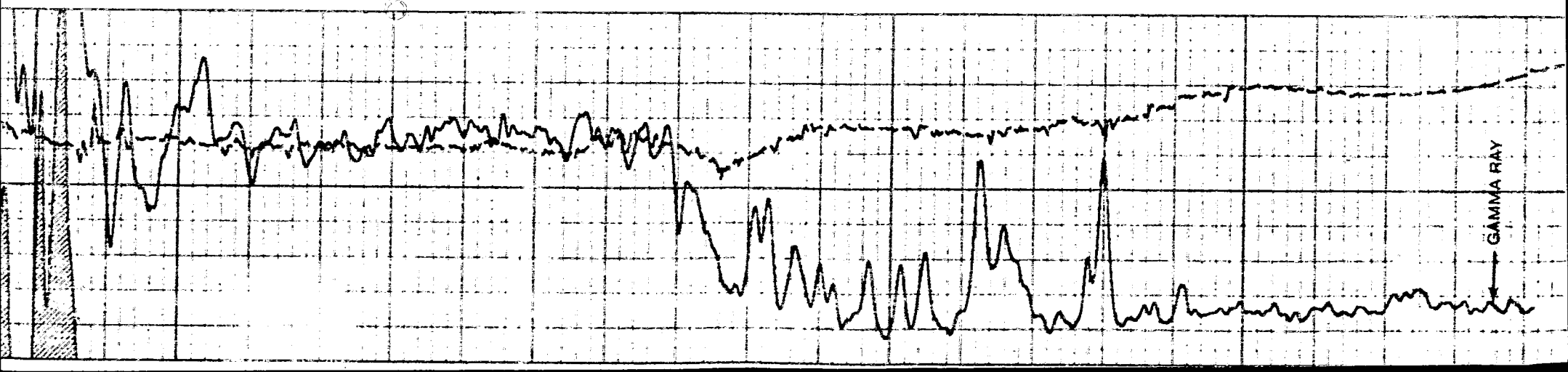




5100

5200

MAR 0 1966
RESEARCH CENTER
MILWAUKEE WISCONSIN



GAMMA RAY

RESUME

OPERATOR: TXO PRODUCTION CORP.

WELL NAME & LOCATION: BERGQUIST "A" #1 SWSESW SEC.32 T15S R42W

COUNTY: WALLACE

STATE: KANSAS

CONFIDENTIAL

SPUD DATE: DECEMBER 23, 1985 3:42pm

COMPLETION DATE (TD): JANUARY 1, 1986 3:15pm

ELEVATIONS: GL 3888' KB 3898'

TOTAL DEPTHS: DRILLER 5260' LOGGER 5267'

CONTRACTOR: MURFIN DRILLING CO. RIG #21

GEOLOGIST: RICHARD E. BACON

ENGINEER: FRANK TSURU

TOOL PUSHER: TERRY McRAE

MUD COMPANY: MAVERICK MUD CO. RICK GRACIAS ENGINEER

TYPE OF MUD: CHEMICAL GEL

HOLE SIZES: 12 1/4" SURFACE TO 385'
7 7/8" 385' TO 5260'

CASING: 9 JOINTS 8 5/8" K-55 24# 374.04 SET AT 384'

CORES: NONE

DST: DST #1 5126-5142 SEE DST REPORT

DST COMPANY: HALLIBURTON

LOGS BY: GREAT GUNS (BRIGHTON, CO) ENGINEER BOB BRINKMAN

TYPE OF LOGS: BCN/DENS/GR 5250' TO 3250'
DUAL/GR/SP 5250' TO 377'

BOTTOM FORMATION: STE. GENEVIEVE (MISSISSIPPIAN)

WELL STATUS: PLUG AND ABANDON

WELL CHRONOLOGY

<u>DATE</u>	<u>7:00am</u> <u>DEPTH</u>	<u>FOOTAGE</u>	<u>ACTIVITY</u>
12-23-85	-	-	SPUD 3:42pm DRILL TO 385' RUN CASING, 9 JOINTS K-55 24# 8 5/8" 374.04' SET AT 384' CEMENT WITH 100 SACKS HOWCOLITE 3% CaCl ₂ & 100 SACKS CLASS c 3% CaCl ₂ WOC
12-24/26-85			DOWN FOR CHRISTMAS
12-27-85	385'	385'	RESUME DRILLING AT 10:22am
12-28-85	2220'	1835'	BIT TRIP AT 1995' DEV. 3/4°
12-29-85	3444'	1224'	DRILLING
12-30-85	4182'	738'	LOST CIRCULATION 4020'
12-31-85	4690'	508'	DRILLING
1-1-86	5136'	446'	TD 5260' AT 3:15pm, CIRCULATE 1 1/2 HOURS, SHORT TRIP 15 STANDS, CIRCULATE 2 HOURS, PULL OUT FOR LOGS DEV. 3 1/2°
1-2-86	5260'	124'	COMPLETE LOGS

CONFIDENTIAL

MAR 03 1986
Hydro Geological Survey
MONTANA BRANCH

SAMPLE DESCRIPTIONS
(NOT LAGGED)

- 3990-4010 SH-60% red orange, maroon, medium-dark grey,
firm, massive, flakey, calcareous & micromicaceous
in part, some silty
LS-40% off white, light grey, buff, crypto-very fine
xln, firm-hard, dense, lithic, chalky
Trace DOL-pink, cryptoxln, hard, dense
- 4010-4040 LS-60% off white, light grey, buff, crypto-very
fine xln, firm-hard, dense, lithic, chalky,
some cherty
SH-40% red orange, maroon, medium-dark grey, as above
- 4040-4070 LS-50% off white, light grey, buff, crypto-very
fine xln, firm-hard, dense, lithic, chalky
SH-50% red orange, maroon, medium-dark grey, firm,
massive, flakey, calcareous & micromicaceous in part
CHT-translucent
- 4070-4100 LS-70% off white, white, light-medium grey, buff,
crypto-very fine xln, firm-hard, dense, lithic,
chalky, some arenaceous
SH-30% red orange, maroon, medium-dark grey, as above
- 4100-4130 SH-70% red orange, maroon, medium-dark grey, firm,
massive, flakey, splintery, calcareous &
micromicaceous in part
LS-30% off white, light grey, buff, crypto-very
fine xln, firm-hard, dense, lithic, chalky,
trace micro-oolitic round-white
- 4130-4160 LS-70% off white, white, buff, light grey, crypto-
very fine xln, firm-hard, dense, lithic, chalky,
some arenaceous, trace dolomitic
SH-30% red orange, medium-dark grey, firm, massive,
flakey, splintery, calcareous & micromicaceous
in part
- 4160-4190 LS-70% off white, white, buff, light grey, crypto-
very fine xln, firm-hard, dense, lithic, chalky,
some arenaceous
SH-30% red orange, medium-dark grey, as above
- 4190-4220 LS-80% off white, white, buff, light grey, tan,
crypto-fine xln, firm-hard, dense, lithic, chalky
SH-20% red orange, medium-dark grey, as above
- 4220-4250 LS-90% off white, white, buff, crypto-very fine xln,
firm-hard, dense, lithic, chalky
SH-10% medium-dark grey, red orange, firm, flakey,
massive, calcareous & micromicaceous in part

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- 4250-4280 LS-90% off white, white, buff, light grey, crypto-very fine xln, firm-hard, dense, lithic, chalky
SH-10% medium-dark grey, red orange, firm, flakey, massive, calcareous & micromicaceous in part
- 4280-4310 LS-90% off white, white, buff, light grey, crypto-very fine firm-hard, dense, lithic, chalky, trace cherty, some arenaceous
SH-10% red orange, medium-dark grey, firm, massive, flakey, calcareous & micromicaceous in part
- 4310-4340 LS-85% off white, white, buff, light grey, crypto-fine xln, firm-hard, dense, lithic, chalky
SH-15% red orange, medium-dark grey, firm, massive, flakey, calcareous & micromicaceous in part
- 4340-4370 LS-60% off white, white, buff, light grey, crypto-very fine xln, firm-hard, dense, lithic, chalky, some silty-arenaceous
SH-40% red orange, medium-dark grey, black, firm, massive, flakey, calcareous & micromicaceous in part, carbonaceous in part
- 4370-4400 LS-50% off white, white, buff, light grey, crypto-very fine xln, firm-hard, dense, lithic, chalky, some silty-arenaceous
SH-50% red orange, medium-dark grey, black, firm, as above
CHT-white
- 4400-4430 LS-70% off white, white, light-medium grey, buff, crypto-microxln, firm-hard, dense, lithic, chalky, some argillaceous
SH-30% red orange, medium-dark grey, black, as above
- 4430-4460 LS-70% off white, white, buff, light grey, crypto-very fine xln, firm-hard, dense, lithic, chalky, becoming argillaceous-silty
SH-30% red orange, medium-dark grey, black, as above
- 4460-4490 LS-80% off white, white, light-medium grey, buff, tan, crypto-very fine xln, firm-hard, dense, lithic, chalky, less argillaceous-silty
SH-20% red orange, medium-dark grey, black, as above
- 4490-4520 SH-90% red orange, medium-dark grey, black, as above largely cavings
LS-10% off white, white, buff, light grey, crypto-microxln, firm-hard, dense, lithic, chalky
- 4520-4550 SH-100% red orange, medium-dark grey, black, as above largely cavings

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- 4550-4580 SH-80% red orange, medium-dark grey, black, firm, massive, flakey, calcareous & micromicaceous in part
LS-20% off white, white, buff, light grey, crypto-microxln, firm-hard, dense, lithic, chalky, trace fossiliferous
- 4580-4610 LS-60% off white, light grey, buff, crypto-very fine xln, firm-hard, dense, lithic
SH-40% red orange, medium-dark grey, black, as above
CHT-white
- 4610-4640 LS-50% off white, white, buff, tan, crypto-very fine xln, firm-hard, dense, lithic, chalky
SH-50% red orange, medium-dark grey, black, as above
CHT-white
- 4640-4670 LS-70% off white, white, light grey, buff, crypto-microxln, firm-hard, dense, lithic, chalky, trace fossiliferous
SH-30% red orange, medium-dark grey, black, as above
- 4670-4700 SH-80% red orange, medium-dark grey, black, as above largely cavings
LS-20% off white, buff, crypto-very fine xln, firm-hard, dense, lithic,
FOSS-crinoid
- 4700-4730 LS-80% medium-dark grey, off white, crypto-very fine xln, firm-hard, dense, lithic, becoming argillaceous
SH-20% red orange, medium-dark grey, black, as above
- 4730-4760 LS-90% light-dark grey, off white, buff, crypto-microxln, firm-very hard, dense, lithic, argillaceous in part
SH-10% medium-dark grey, black, firm, flakey, fissile, calcareous & micromicaceous in part, carbonaceous in part
- 4760-4790 LS-80% light-dark grey, off white, buff, crypto-very fine xln, firm-very hard, dense, lithic, argillaceous in part, some silty
SH-20% medium-dark grey, black, firm, as above
- 4790-4820 LS-85% light-dark grey, off white, buff, tan, crypto-microxln, firm-very hard, dense, lithic, argillaceous in part, trace fossiliferous
SH-15% medium-dark grey, black, firm, flakey, fissile, micromicaceous in part, carbonaceous in part
CHT-tan, spotted
- 4820-4850 LS-70% light-dark grey, off white, buff, tan, crypto-very fine xln, firm-very hard, dense, lithic, argillaceous in part, trace pyritic
SH-30% medium-dark grey, black, as above

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- 4850-4880 LS-60% off white, light-dark grey, buff, tan, crypto-fine xln, firm-very hard, dense, lithic, argillaceous in part
SH-40% medium-dark grey, black, firm, flakey, fissile, micromicaceous in part, carbonaceous in part, abundant cavings
CHT-mottled white-buff
- 4880-4910 LS-80% light-dark grey, off white, buff-tan, crypto-very fine xln, firm-hard, dense, lithic, argillaceous in part
SH-20% medium-dark grey, black, as above, less cavings
CHT-dark grey brown
- 4910-4940 LS-80% buff, light-dark grey, tan, crypto-microxln, firm-very hard, dense, lithic, argillaceous in part, traces of finely disseminated pyrite
SH-20% medium-dark grey, black, as above
CHT-dark tan
- 4940-4970 LS-85% buff, light-dark grey, tan, crypto-microxln, firm-very hard, dense, lithic, argillaceous in part
SH-15% medium-dark grey, black, as above
CHT-black
- 4970-5000 LS-85% buff, brown grey, light-dark grey, crypto-microxln, firm-very hard, dense, lithic, trace fossiliferous, argillaceous in part
SH-15% medium-dark grey, black, as above
CHT-white, spotted
- 5000-5030 LS-90% light-dark grey, off white, buff, crypto-microxln, firm-very hard, dense, lithic, argillaceous in part
SH-10% medium-dark grey, black
CHT-tan, black
- 5030-5060 LS-80% light-dark grey, off white, buff, crypto-microxln, firm-very hard, dense, lithic, argillaceous in part, trace oolitic round-buff
SH-20% medium-dark grey, black, as above
- 5060-5070 LS-70% buff, tan, grey brown, crypto-microxln, firm-very hard, dense, lithic, trace oolitic round-buff
SH-30% medium-dark grey, black, grey green, firm, waxy, flakey, fissile, micromicaceous in part, carbonaceous in part
CHT-tan, black free pyrite

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- 5070-5080 LS-70% buff, tan, grey brown, crypto-microxln,
firm-very hard, dense, lithic,
SH-30% medium-dark grey, black, grey green, firm,
waxy, flakey, fissile, calcareous & micromicaceous
in part, carbonaceous in part
CHT-white, spotted, black
Trace SS-translucent, fine-medium grain, angular-
subangular, friable-firm, calcareous, poor
sorting, no visible porosity, NO SHOW
- 5080-5090 LS-60% buff, tan, grey brown, crypto-microxln,
firm-very hard, dense, lithic
SH-40% medium-dark grey, black, grey green, as above
CHT-black, pyritic
COAL-black, brittle, bitumenous
Trace SS-translucent, fine-medium grain, as above
NO SHOW
- 5090-5100 SH-100% medium-dark grey, black, grey green, firm,
waxy, flakey, fissile, splintery, blocky,
calcareous & micromicaceous in part, carbonaceous
in part
Trace LS-buff, cryptoxln, hard, dense
Trace SS-translucent, fine-medium grain, as above
NO SHOW
- 5100-5110 SH-95% medium-dark grey, black, grey green, as above
LS-5% buff, tan, cryptoxln, firm-hard, dense, lithic
- 5110-5120 SH-85% medium-dark grey, black, grey green, as above
LS-15% buff, tan, cryptoxln, firm-hard, dense, lithic
Trace SS-white, light grey, very fine-fine grain,
subround, firm, calcareous, fair sorting,
slightly glauconitic, tight, NO SHOW
- 5120-5130 SH-80% medium-dark grey, black, grey green, as above
LS-20% buff-tan, cryptoxln, firm-hard, dense, lithic
Trace SS-white, light grey, very fine-fine grain,
subround, firm, calcareous, fair sorting, tight,
slightly glauconitic, traces dead oil stain, NO SHOW
- 5130-5140 SH-95% medium-dark grey, black, grey green, as above
LS-5% buff-tan, cryptoxln, firm-hard, dense, lithic
Trace SS-white, light grey, very fine-fine grain,
subround-round, firm-hard, siliceous-calcareous,
well sorted, tight, NO SHOW

- 5140-5150 SH-95% medium-dark grey, black, grey green, firm, waxy, flakey, fissile, splintery, blocky, calcareous & micromicaceous in part, carbonaceous in part
 LS-5% buff-tan, cryptoxln, firm-hard, dense, lithic, Trace SS-white, light grey, very fine-fine grain, subround-round, firm-hard, siliceous-calcareous, well sorted, tight, NO SHOW also clear-white, fine-medium grain, subangular-siliceous-calcareous, firm, fair sorting, tight, NO SHOW
- 5150-5160 SH-80% medium-dark grey, black, grey green, as above
 LS-15% buff-tan, cryptoxln, firm-hard, dense, lithic
 SS-5% white, very fine-fine grain, angular-subround, firm-hard, siliceous-calcareous, poor-fair sorting, slightly glauconitic, no visible porosity
 TRACES EVEN BRIGHT YELLOW FLUORESCENCE
 MODERATE, PALE MILKY YELLOW STREAMING
 EVEN, PALE YELLOW RING, DRY CUT
- 5160-5170 SH-40% medium-dark grey, black, grey green, as above
 LS-50% buff-tan, off white, crypto-microxln, firm-very hard, dense, lithic, occasional fossils
 SS-10% white, very light tan, very fine-fine grain, subround-round, firm-hard, calcareous-siliceous, well sorted, slightly glauconitic, trace biotite
 TRACES EVEN BRIGHT YELLOW GREEN FLUORESCENCE
 IMMEDIATE BRIGHT MILKY YELLOW STREAMING
 EVEN BRIGHT YELLOW GREEN RING, DRY CUT
- 5170-80 LS-70% buff-tan, crypto-microxln, firm-hard, dense, lithic, more fossils, trace glauconitic
 SH-25% medium-dark grey, black, grey green, as above
 SS-5% white, very light tan, very fine-fine grain, subround-round, firm-hard, calcareous-siliceous, well sorted, slightly glauconitic, tr dead oil stain
 TRACES EVEN BRIGHT YELLOW GREEN FLUORESCENCE
 IMMEDIATE BRIGHT MILKY YELLOW STREAMING
 EVEN BRIGHT YELLOW GREEN RING, DRY CUT
- 5180-5190 LS-80% buff-tan, crypto-microxln, firm-hard, dense, lithic, occasional fossils,
 SH-20% medium-dark grey, black, grey green, as above
 Trace SS-white, very fine-fine grain, subround-round, firm-hard, calcareous-siliceous, well sorted, slightly glauconitic
 TRACES EVEN BRIGHT YELLOW GREEN FLUORESCENCE
 MODERATE BRIGHT MILKY YELLOW STREAMING
 EVEN BRIGHT YELLOW GREEN RING, DRY CUT

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- 5190-5200 LS-85% buff-tan, crypto-microxln, firm-hard, dense, lithic, occasional fossils
 SH-15% medium-dark grey, black, grey green, firm, waxy, flakey, fissile, blocky, splintery, calcareous & micromicaceous in part, carbonaceous in part, trace pyritic
 Trace SS-white, very fine-fine grain, subround-round, firm-hard, calcareous-siliceous, well sorted, slightly glauconitic
 TRACE EVEN BRIGHT YELLOW GREEN FLUORESCENCE
 MODERATE, PALE MILKY YELLOW STREAMING
 EVEN, BRIGHT YELLOW GREEN RING, DRY CUT
- 5210-5220 LS-75% buff-tan, crypto-microxln, firm-hard, dense, lithic, occasional fossils, also white, cryptoxln, firm, dense, very arenaceous
 SH-25% medium-dark grey, black, grey green, grey brown, waxy, flakey, fissile, blocky, calcareous & micromicaceous in part, carbonaceous in part
- 5220-5230 LS-80% buff-tan, crypto-microxln, firm-hard, dense, lithic, occasional fossils, also more white, cryptoxln, friable-firm, dense, very arenaceous
 SH-20% medium-dark grey, black, grey green, as above
- 5230-5240 LS-60% buff-tan, crypto-microxln, firm-hard, dense, lithic, occasional fossils, also white, cryptoxln, friable-firm, very arenaceous
 SH-40% medium-dark grey, black, grey green, grey brown, firm, waxy, flakey, fissile, splintery, calcareous & micromicaceous in part, carbonaceous in part
- 5240-5250 LS-70% buff-tan, crypto-microxln, firm-hard, dense, lithic, occasional fossils, also white, cryptoxln, friable-firm, very arenaceous
 SH-30% medium-dark grey, black, grey green, as above
- 5250-5260 LS-75% buff-tan, crypto-microxln, firm-hard, dense, lithic, occasional fossils, also white, cryptoxln, friable-firm, dense, very arenaceous
 SH-25% medium-dark grey, black, grey green, as above

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 TABLE 10-3
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 TABLE 10-3

MUD RECORD

<u>DEPTH</u>	<u>WEIGHT</u>	<u>VISCOSITY</u>	<u>FILTRATE</u>	<u>pH</u>	<u>CHLORIDES</u>	<u>LCM</u>
3588	9.4	27	-	7.0	44,000	-
4273	9.3	31	-	7.8	24,000	1#
4817	9.1	38	16.4	8.0	12,000	-
4862	9.1	39	8.4	9.5	11,000	-
5218	9.2	46	8.0	10.0	11,000	-

BIT RECORD

<u>NO.</u>	<u>SIZE</u>	<u>MAKE</u>	<u>TYPE</u>	<u>DEPTH OUT</u>	<u>FOOTAGE</u>	<u>HOURS</u>
1	12 1/4	STC	DTTr	390	390	4
1	7 7/8	HTC	R-1	1995	1610	12 1/2
2	7 7/8	HTC	J-22	5260	3265	95 3/4

DRILLING PARAMETERS

<u>DEPTH</u>	<u>REVOLUTIONS</u>	<u>WEIGHT</u>	<u>PRESSURE</u>	<u>SPM</u>
3170	75/80	40K	1,000	64
3880	70/75	40K	1,000	64
4300	70	40K	1,000	64
4900	75	40K	1,000	64
5100	75	35	800	58