

# MIKE ENGELBRECHT

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## GEOLOGIST'S REPORT DRILLING TIME AND SAMPLE LOG

OPERATOR RITCHIE EXPLORATION INC.

LEASE # 1 HEIER 13 D

FIELD WILDEART

LOCATION NW SE SE = 975' FSL & 1150' EEL

SEC. 13 TWP. 12 RGE. 29W

COUNTY GOVE STATE KS.

CONTRACTOR WM DRLG RIG # 8

CONV. 9-3-14 COMP. 9-13-14

RTD 4640 LOG TD 4641

SAMPLES SAVED FROM 355D TO RTD

DRILLING TIME KEPT FROM 3400 TO RTD

SAMPLES EXAMINED FROM 355D TO RTD

GEOLOGICAL SUPERVISION FROM 3860 TO RTD

HAND UP 3400' DISPLACED TYPE CHEMICAL

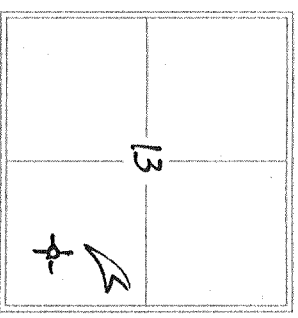
API # 15-063-22,216-00 00

FORMATION	TOP	LOG	DATUM	TOP	SAMPLE	DATUM	STRUCT. COMP.
ANHYDRITE	2291	+498	2290	+499	-3		
BASE	2327	+462	2327	+462	-3		
STETLER	3538	-749	3537	-748	+1		
NEEMER	3898	-1109	3895	-1106	+1		
LANISING	3936	-1147	3935	-1146	+3		
MUNDIE SH	4074	-1285	4072	-1283	+4		
STARK SH	4161	-1372	4160	-1371	+5		
BKE	4216	-1427	4214	-1425	+10		
ALTAMONT	4259	-1470	4256	-1467	+3		
PAWNEE	4336	-1547	4335	-1546	+4		
MYRIAD	4380	-1591	4377	-1588	+2		
FLSCOTT	4414	-1625	4412	-1623	+6		
CHEXOKEE	4442	-1653	4438	-1649	+4		
MISSISSIPPI	4511	-1722	4508	-1719	+4		

ELEVATION  
KB 2789  
DF  
GL 2784  
Measurements Are All From KB 2789

CASING RECORD  
SURFACE 8 5/8" @ 250'  
w/180 SKS.  
PRODUCTION NA

WELL LOG SURVEYS  
NABORS  
COMP DENIS PER.  
DUAL INDUCTION  
JAN MARRS



REFERENCE WELL FOR STRUCTURAL COMPARISON

RET #1 KUHN 19A OIL WELL  
1900' ENL & 1490' EEL 19-12-20W

DATE	DEPTH	NO	SIZE	WGT	TIME	DEPTH CUT
9-3-14	MIRT / SPUD					
9-4	DRLG. @ 1070'					
9-5	DRLG. @ 2980					
9-6	DRLG. @ 3706					
9-7	DST#1 @ 3975					
9-8	QFS @ 4098					
9-9	DST#4 @ 4154					
9-10	QFS @ 4275'					
9-11	DST#6 @ 4445					
9-12	QFS @ 4530					
9-13	PLUGGING					



2300

10

20

BASE ANH 2327

30

1462

40

3400

10

20

30

40

50

60

70

80

90

3500

10

20

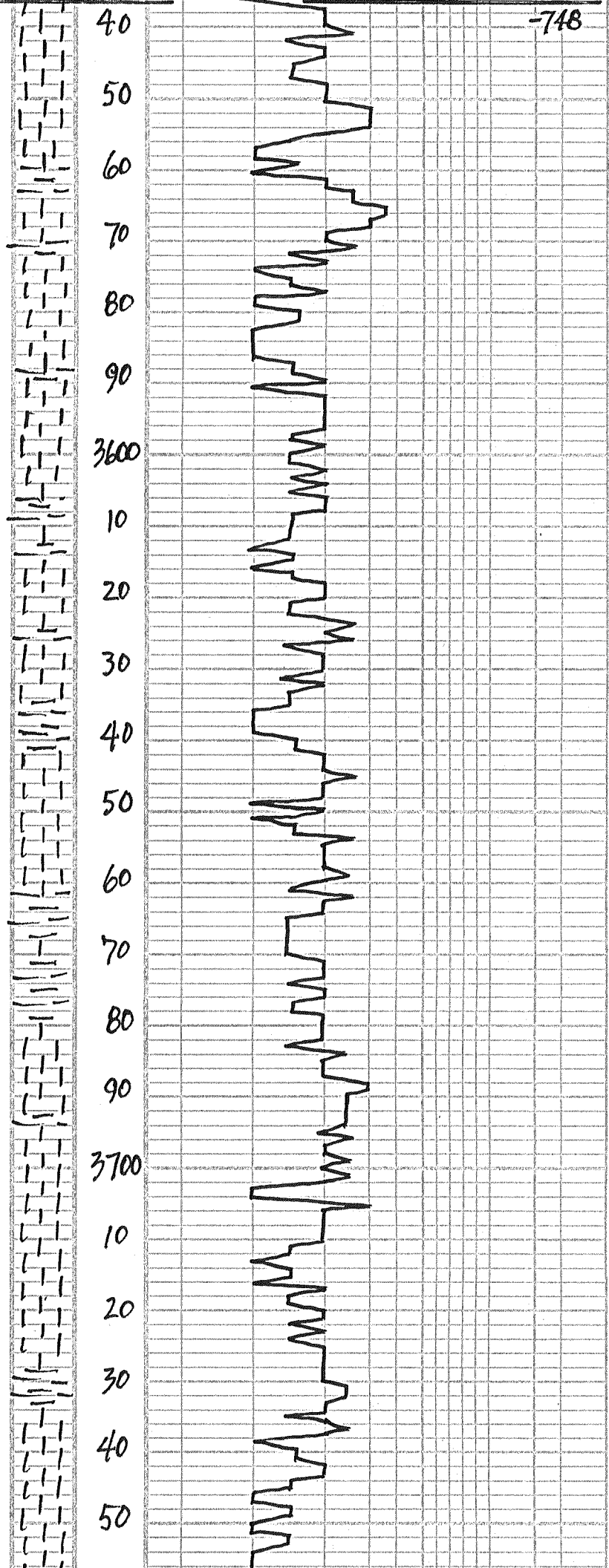
30

STOTLER 3537

← VISC: 60  
WT: 8.6  
LCM: 2#

PRED GRAY SILS GUMBO

Vertical text on the left margin, possibly a well name or log ID.



LT GRAY FN-GRN SST-DIRTY MICA-NS  
 60 SHS AA FEW LT CRM SLI-FOSS LS  
 POOR  $\phi$ -NS NO ODOR

LT CRM-SEMI-FOSS LS P-F  $\phi$   
 NS NO ODOR

80 LS AA FAIR  $\phi$ -NS INC CRM

LT TAN BUFF-FOSS LS FAIR  $\phi$ -NS  
 NO ODOR FEW DK GRN-BLK SHS  
 60 LS AA-NS SLI-INC CRM

WH-LT CRM SLI-FOSS CRM LS  
 NS NO ODOR

20 LT GRAY SLI-FOSS LS DNSE POOR  $\phi$   
 NS NO ODOR

LT TAN-GRN BUFF SLI-FOSS LS  
 POOR  $\phi$ -NS NO ODOR

40 WH-LT CRM-TAN SLI-FOSS LS  
 POOR  $\phi$ -NS

LT BUFF SLI-FOSS LS P-F FOSS  $\phi$   
 FEW SCAT LT SYN, NO FO  
 NO ODOR CRM-INEALY

60 LT BUFF LT TAN SEMI-FOSS LS  
 P-F  $\phi$  W/SCAT LT SYN, NO ODOR

LT-MD GRAY SLI-FOSS LS POOR  $\phi$   
 NS

80 LT CRM-LT TAN SEMI-FOSS LS  
 P-F  $\phi$ -NS NO ODOR

LT TAN-BUFF SEMI-FOSS LS  
 P-F  $\phi$ -NS

40 LT CRM-LT BUFF V. FOSS LS  
 FAIR  $\phi$ -NS NO ODOR

LT CRM-LT GRAY FN-XLN LS  
 DNSE POOR  $\phi$ -NS

20 LT CRM V. FOSS LS FAIR FOSS  $\phi$   
 NS NO ODOR

LT CRM-BUFF V. FOSS LS FAIR  $\phi$   
 NS NO ODOR

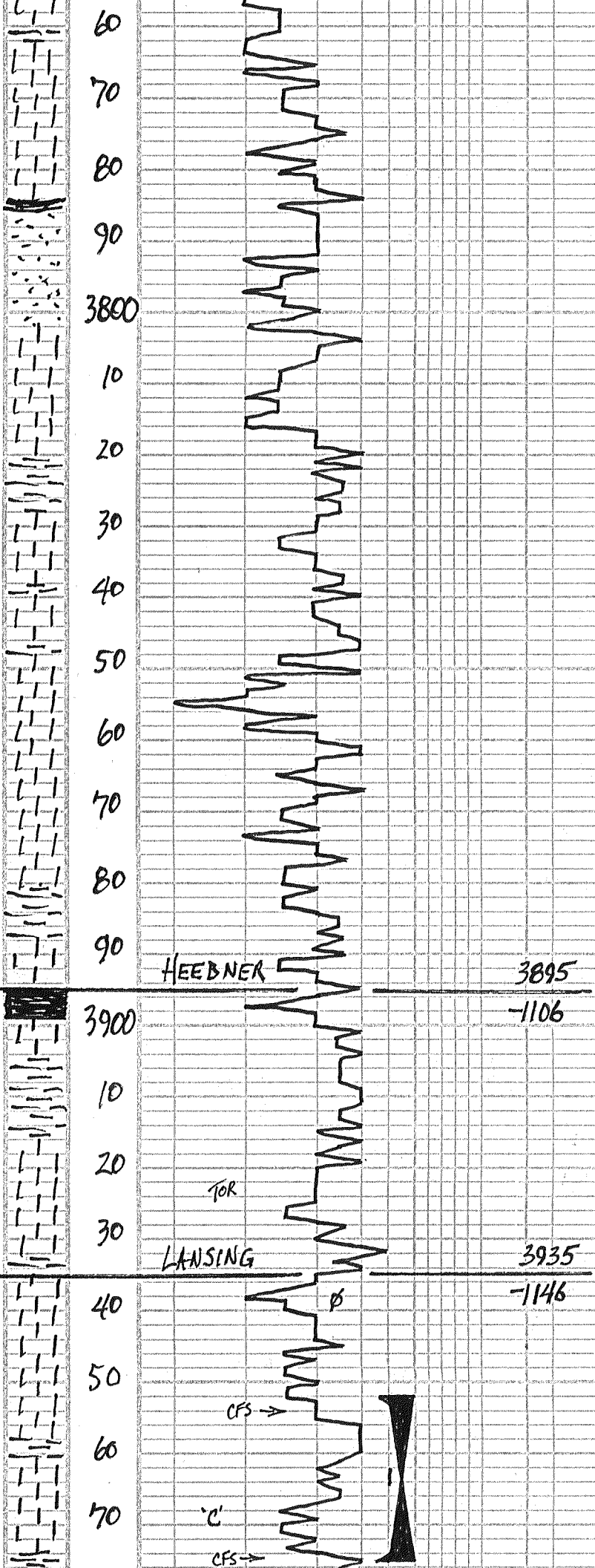
40 LT BUFF LT TAN FOSS LS-NS

LT GRAY-BUFF SHY LS P-F  $\phi$   
 NS NO ODOR

60 LT CRM SEMI-FOSS LS PTLY CRM  
 P-F  $\phi$ -NS NO ODOR

FLOOD WH-LT CRM FOSS OOCL LS  
 P-F FOSS  $\phi$ -NS NO ODOR  
 INC CRM

80 WH-LT CRM CRM LS AA-NS



PREN WH-LTCRM SLI-FOSS LS  
P-FØ - NS NO ODOR

00 LTCRM-LT TAN SLI-FOSS LS  
P-FØ - NS

FEW BLK SHS LS AA NS

20 FEW LT GRN GRN FN GR SST  
SILTØ - SHLY - CKY - NS NO ODOR

FLOOD WH-LTCRM CKY LS Peorp  
NS NO ODOR

40 CRM-LT BUFF SLI-FOSS LS  
POOR Ø - NS DNSE - CKY

LS AA-NS CKY-DNSE-NO ODOR  
FEW BLK SHS

60 LTCRM-BUFF FOSS LS P-FØ  
NS NO ODOR PTLY CKY

WH-LTCRM FOSS CKY LS P-FØ  
NS NO ODOR

80 LTCRM LT TAN FN XLN SLI-FOSS  
LS POOR Ø - NS NO ODOR

90 LTCRM-LT TAN SEMI-ØØ LS  
P-FØ - NS NO ODOR CKY

00 LTCRM SUB ØØ LS P-F ØØ  
NS NO ODOR PTLY CKY

700# PP  
VISC: 57 FILT: 6.8  
WT: 8.6 CKL: 1,700  
GEOLOG ON LOC. SAT 12:30 PM  
9-6-14

10 LOTS LT TAN CKY LS W/SCAT  
LT DEAD STN NO ODOR  
LOTS BLK SHS

20 LTCRM-BUFF SLI-FOSS CKY LS  
POOR Ø - NS NO ODOR

30 LTCRM LS AA 1/2 LT GRN GRN SHS

40 FLOOD WH FOSS CKY - 1/4 LS  
P-FØ - NS NO ODOR

50 CRM-V LT GRN FN XLN SLI-FOSS LS  
POOR Ø - NS NO ODOR PTLY CKY

54) WH-LTCRM ØØ LS P-FØ PTLY  
CKY NS NO ODOR

20 MIN: FLOOD WH SEMI FOSS CKY LS  
P-FØ SOFT NS NO ODOR

45 MIN: WH-LTCRM SLI-FOSS LS P-FØ  
NS NO ODOR PTLY CKY

WH-LTCRM SLI-FOSS LS - NS

70 LTCRM-LT TAN SLI-FOSS LS  
POOR Ø - NS NO ODOR SLI CKY

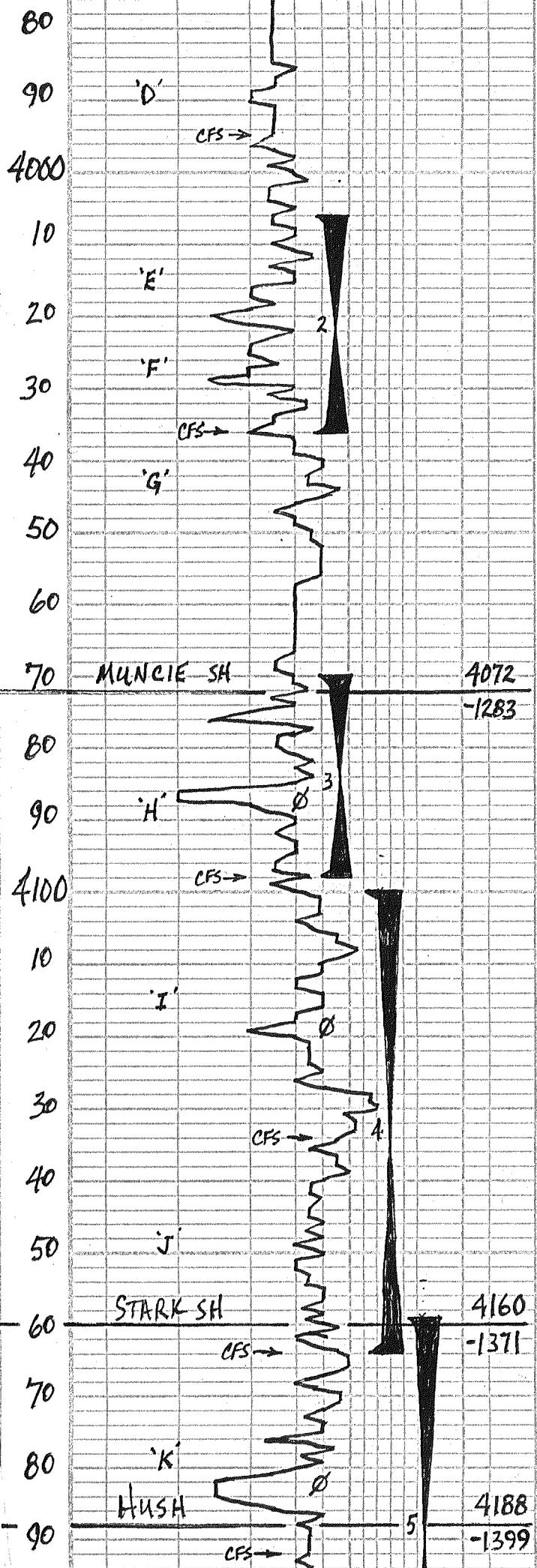
75) LTCRM-SLI-FOSS LS W/Peorp  
Ø - NS NO ODOR INC GRN SHS

20 MIN: LTCRM ØØ LS W/P-F INTER  
ØØ W/ØØ BRN FD TRACE GAS  
BRN FD ØØ ON BRK CLEAN LOW ENDR

45 MIN: FEW PØS AA W/SS ØØØ,  
INC IN CKY

SHORT TRIP 44 STDS  
PIPE STRAP .20 SHORT  
S.H.T. = 3/4"

DST #1 3952-3975  
30-45-45-60  
IF: WK BUILT TO 50' M  
FF: V.WK BUILT TO 5 1/2"  
REC: 15' WCM = 21% W, 79% M  
175' MCW = 17% W, 83% M  
190' T.F. CHL = 53,000  
SID: 1246-1237  
IDP: 10-67 FFD: 69-99



90 PRED RUST-BRN SHS FEW GRM SHS  
 95) FEW LTCRM. BUFF SLI-FOSS LS  
 POOR  $\phi$  - NS NO ODOR  
 20 MIN: WH-LTCRM SLI-FOSS LS  
 POOR  $\phi$  MOSTLY CLK NS NO ODOR  
 45 MIN: PRED, WH-LTCRM SLI-FOSS  
 LS POOR  $\phi$  - NS NO ODOR CLK  
 10 WH-LTCRM SLI-FOSS LS - NS  
 PTLY CLK NO ODOR  
 20 LTCRM-LT TAN FN-MD-XLN LS  
 POOR  $\phi$  - NS NO ODOR PTLY CLK

TEMP: 116  
 DST#2 4006-4036  
 30-45-45-60  
 IF: WK BUILT TO BOB 19 MIN.  
 FF: WK BUILT TO BOB 21 MIN.  
 REC: 78' HMCW = 47% M, 53% W  
 189' SLMCW = 18% M, 82% W  
 248' VSLMCW = 1% M, 99% W  
 515' T.F. = CHL = 53,000  
 SIP: 1244-1241  
 IFP: 14-132 FFP: 134-250  
 TEMP: 125

30 WH-LTCRM V, FOSS LS W/P-F TINY  
 FOSS  $\phi$  W/SSLT BRGFO, LT ODOR  
 SLI CLK 12 PCS  
 36) DECR IN LTCRM SEMI-FOSS LS  
 6 PCS W/SSLT BRNFO, FT ODOR  
 20 MIN: WH-LTCRM FOSS LS W/P-F  
 TINY PPT - LGRE VUG  $\phi$  W/S-FSLTGF  
 40 PCS FAIR ODOR MOSTLY CLEAN FEW CLK  
 45 MIN: DECR IN WH-LTCRM FOSS LS  
 20 W/P-F FOSS  $\phi$  W/SSGFO, FAIR ODOR  
 PCS SLI IN CLK PCS, MOST CLEAN  
 50 WH-LTCRM SLI-FOSS LS W/POOR  
 FOSS  $\phi$  FEW A W/SSLT BRFO, FT ODOR

DST#3 4070-4098  
 30-45-45-60  
 IF: WKS BUILT TO 3"  
 FF: NO BLOW BUILT TO 2"  
 REC: 10' CO = 36° GRAV.  
 61' SLO & WCM = 5% D, 5% W, 90% A  
 61' SLO & WCM = 3% D, 40% W, 57% A  
 132' T.F. CHL = 39,000  
 SIP: 1140-1058  
 IFP: 11-42 FFP: 47-68  
 TEMP: 116°

60 WH-LTCRM SLI-FOSS LS P-F  $\phi$   
 NS NO ODOR  
 70 FLOOD WH FN-MD-XLN LS  
 MOSTLY CLK POOR  $\phi$  NS NO ODOR  
 80 FLOOD LT WH-LT GRN FN-XLN LS  
 POOR  $\phi$  - NS NO ODOR CLK  
 90 FLOOD BLK SHS!

DST#4 4100-4164  
 30-30-30-30  
 IF: WK DIED IN 19 MINS.  
 FF: NO BLOW - FLUSH  
 REC: 101' MUD  
 SIP: 38-130  
 IFP: 12-13 FFP: 13-66

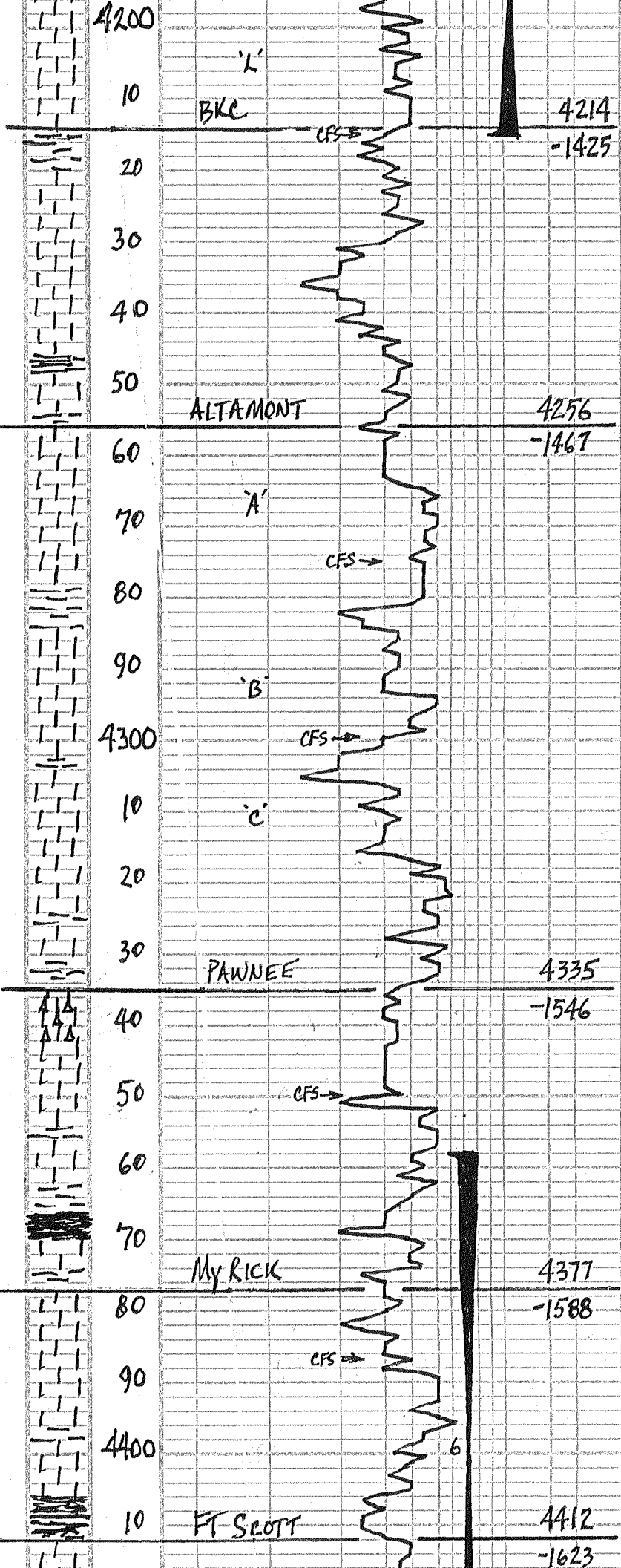
98) LTCRM-LT TAN GRAN ATN, LS  
 P-F INTER GRAN SLI-FOSS PCS FEWS  
 SRT STN LOTS SSV LTGFO, GD ODOR  
 30 MIN: DECR IN PCS W/SSLT GFO  
 IN P-F FOSS  $\phi$  LT ODOR  
 60 MIN: WH-LTCRM FN-XLN LS  
 DNSE - CLK - POOR  $\phi$  NS NO ODOR  
 10 LTCRM-LT BUFF FN-MD-XLN LS  
 POOR  $\phi$  - NS NO ODOR SLI CLK  
 20 PRED LT GRN SLI-FOSS DNSE LS  
 POOR  $\phi$  - NS NO ODOR

DST#5 4159-4215  
 30-45-30-45  
 IF: BUILT TO 2" SLID 5" TO BOT  
 FF: WK SURF BLOW  
 REC: 123' MUD  
 SIP: 1121-1002  
 IFP: 46-62 FFP: 63-72  
 TEMP: 116°

30 LT TAN TINY-FOSS PPT  $\phi$  LS 10 PCS  
 W/SSLT BRNGFO, FT ODOR ON BRK  
 LOW ENERGY NO SNAP CRACK POP  
 34) DECREASE IN PCS AA WH-CRM  
 FN-XLN SLI-FOSS LS - NS NO ODOR  
 30 MIN: LTCRM SLI-FOSS LS POOR  
 $\phi$  - NS NO ODOR, PTLY CLK  
 50 PRED RUST-RED GUMBO SHS \*

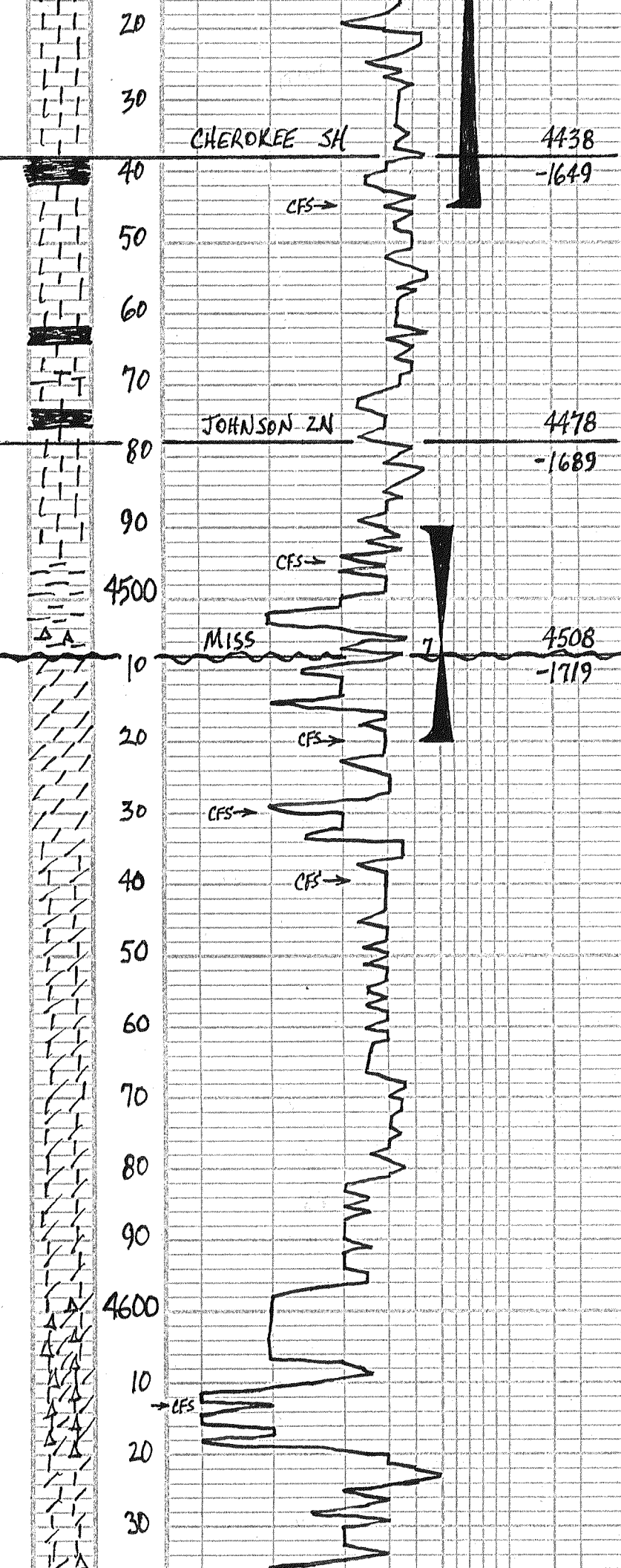
LTCRM MICRO-FOSS LS W/POOR FOSS  
 60  $\phi$  W/SCAT LT STN, FEW PCS SSLT GFO  
 LT ODOR ON BRK SLI CLK  
 64) LTCRM SLI-FOSS LS W/SCAT MED  
 VUG  $\phi$  W/SSLT GFO, FAIR-GD ODOR  
 SNAP-CRACK-POP SLI CLK  
 30 MIN: LTCRM SLI-FOSS LS W/SCAT  
 VUG  $\phi$  W/S-FSLTGF FAIR ODOR  
 60 MIN: CRM LS AA W/SSLT GFO  
 LT-FAIR ODOR, SLI CLK, LOTS GRV/SH

80 PRED GRAY-BLK SHS & LT BUFF SLI-  
 FOSS LS W/POOR  $\phi$  - NS NO ODOR  
 90 FLOOD V. LT GRN - BUFF FN-MD-XLN  
 LS PTLY CLK POOR  $\phi$  NS NO ODOR  
 92) LT GRN BUFF GRAN SLI-FOSS LS  
 FAIR  $\phi$  - NS NO ODOR PTLY CLK  
 30 MIN: V. LT GRN - BUFF SLI-FOSS LS  
 PARTLY GRAN POOR  $\phi$  NS NO ODOR?  
 PTLY CLK FEW GRN-BLK SHS  
 60 MIN: LTCRM BUFF FOSS - NOB LS  
 P-F  $\phi$  - NS NO ODOR PTLY CLK  
 FEW GRN-BLK SHS



60 LOTS GRAY - BLK SHS.  
 70 LT BUFF SLI - FOSS LS W/P-F INTER  
 - XLN & SCAT STN LT ODR  
 15) FLOOD LT CRM - BUFF SLI - FOSS  
 LS P-F FEW PCS LT STN, NO ODR  
 30 MIN: LT CRM - LT GRAY FN-MD XLN  
 LS, POOR P-F FEW SCAT STN, NO FO  
 60 MIN: LT CRM - BUFF SLI - FOSS  
 LS W/P-F FEW PCS LT STN  
 NO FO, PTLY CRK  
 30 PRED GRAY SHS FEW SILTY  
 40 FEW LT CRM BUFF SLI - FOSS LS  
 POOR P-F - NS NO ODR  
 50 WH - LT CRM CRK LS POOR P-F - NS  
 NO ODR - LOTS GRAY - BRN SHS  
 60 WH - LT CRM - V. LT GRAY CRK LS  
 POOR P-F - NS NO ODR  
 LT GRN - PURP SILTY SHS  
 70 LT CRM - V. LT GRAY FN - XLN LS POOR P-F  
 NS NO ODR PTLY CRK  
 75) LT CRM SLI - FOSS LS POOR P-F - NS  
 NO ODR PTLY CRK  
 30 MIN: LT CRM SILTY - CRK LS  
 POOR P-F - NS NO ODR LT PUR SHS  
 60 MIN: LT CRM - LT BUFF FN - XLN LS  
 POOR P-F - NS NO ODR  
 80 LS AA - NS NO ODR LOTS SHS  
 90 LT CRM - BUFF SLI - FOSS LS W/P  
 P-F - NS NO ODR, LOTS GRAY - BRN SHS  
 100 WH - LT PURPLE SLI - FOSS CRK LS  
 POOR P-F - NS NO ODR  
 30 MIN: LT CRM - LT PURP FN - XLN  
 CRK LS POOR P-F - NS NO ODR  
 60 MIN: CRK - V. LT PURP FN - XLN LS  
 POOR P-F - NS NO ODR  
 10 CRK - BUFF SLI - FOSS LS POOR P-F  
 NS NO ODR  
 20 WH - LT CRM SLI - FOSS LS POOR P-F  
 NS NO ODR, INC CRK  
 30 V. LT GRAY - BUFF FN - XLN LS POOR P-F  
 PTLY CRK - DNSE, NS, NO ODR  
 40 V. LT PEACH GRAY MEALY LS - NS  
 INC BRN - RUSTY SHS  
 50) FLOOD WH FN - XLN LS DNSE - CRK  
 & DRILL WH - LT GRAY A POOR P-F NS  
 30 MIN: WH - V. LT BUFF FN - XLN GRAY  
 LS POOR P-F - NS NO ODR DNSE - CRK  
 60 MIN: LS AA - NS NO ODR  
 60 PRED V. LT GRAY - BUFF FN - XLN LS  
 POOR P-F - NS NO ODR  
 70 LT - MD GRAY FN - XLN LS POOR P-F  
 NS NO ODR  
 80 FLOOD BLK SHS!  
 87) PRED BLK SHS LESSOR THAN BUFF  
 FUSSLD LS POOR P-F QUES STN NO FO  
 30 MIN: LT CRM V. CRK LS W/FAIR ODR  
 P-F W/SSLTGFED FAIR ODR 13 PCS  
 60 MIN: LT CRM LS W/FAIR FOSS P-F  
 W/SSLTGFED FAIR ODR FEW  
 W/SSLTGFED SLI CRK FEW LT PCS  
 PRED GRAY! FN - XLN LS DNSE -  
 SLI CRK POOR P-F - NS NO ODR  
 LOTS BLK SHS & LS AA - NS  
 \*  
 10 LT CRM FOSS LS W/P-F FOSS P-F  
 4 PCS W/SSLTGFED, LT ODR SLI - CRK  
 20 FLOOD BLK FOSS SHS! SSG Bub

MUD-COV  
 VISC: 48 FILT: 8.0  
 WT: 9.4 CHL: 1,600  
 LCM: 1#  
 ADDING PRE-MIX  
 950# PP  
 VISC: 52  
 WT: 9.2  
 DST#6 4358-4445  
 30-45-45-60  
 IF: WK BUILT TO 9 1/2"  
 FF: V. WK BUILT TO 11 1/2"  
 REC: 217' GIP  
 35' SLOCH = 10% 0.96% N



\* 30 LTCRM - BUFF LS w/ SCAT MD FOSS & 10 PCS w/ SSLTGF, LT ODOR CLEAN

40 FLOOD LTCRM - BUFF SEMI-FOSS LS w/ POOR & FEW SCAT STN NO FO

45) FEW PCS LT BUFF LS w/ SCAT STN, LT ODOR SH-CHK

30 MIN: LOTS BLK SH

60 MIN: LTCRM SLI-FOSS LS POOR & - NS NO ODOR, PTLY CHK

60 GRAY - SALT-PEPPER SLI-FOSS LS POOR & - NS NO ODOR DNSE-CHK

70 FLOOD WH FN-XLN LS DNSE-CHK POOR & - NS NO ODOR

80 WH-LTCRM-LT TAN FN-XLN LS NS NO ODOR FEW GRAY-BLK SHS

90 WH-LTCRM-LT BUFF FN-XLN LS POOR & - NS NO ODOR GRAY-BLK SHS

95) LS AA- NS INC GRAY GRN BLK SHS

30 MIN: WH-CRM-LT TAN FN-XLN LS POOR & - NS DNSE-CHK NO ODOR

50 MIN: WH-CRM FN-XLN LS POOR & - NS NO ODOR PTLY CHK

PRED WH-CRM SLI-FOSS LS POOR &

10 FEW CL QUARTZITE MUNKS POOR & 12 FN-GR SST POOR & DIRTY LNS FEW ORN-GOLD SHARP AS - NS

20) LOTS LIGHT BRIGHT GRN SHS INC A SHARP NS NO ODOR

30 MIN: LT TAN DOLD FEW SUCROSIC & BIG VUG & 6 PCS w/ FSDR BFO TRACE GAS BUB, LT ODOR ON BRK

60 MIN: INC TAN DOLD w/ FAIR VUG & DECK IN PCS w/ FBRED LT ODOR ON BREAK FEW GAS BUB HR S.C.P.

30) PRED GOLD & PURPLE SHS

30 MIN: FEW PCS WH-LT GRAY DOLD FN-XLN w/ SCAT VUG & 3 PCS w/ SFO SLUFF & MOST BARREN FROM DRK

60 MIN: LOTS LT TAN SUCR DOLD w/ FAIR FOSS-VUG & - NS NO ODOR

40) LT GRAY-VLT BUFF DOLD FEW w/ VUG & - NS NO ODOR FEW GRAY

30 MIN: FLOOD WH-CRM LS PTLY VUGGY FOSS P-F & - NS NO ODOR

60 MIN: WH-LTCRM DOLD LS w/ P-F SCAT VUG & - NS NO ODOR PTLY CHK

50 PRED WH-CRM DOLD & DOLD LS P-F & - NS NO ODOR

60 LTCRM-BUFF CHK DOLD LS P-F & - NS NO ODOR LOTS CHK

70 WH-LTCRM SUB COC CHK BLY LS P-F & - NS NO ODOR

80 WH-LTCRM CHK COC LS POOR & - NS NO ODOR

90 DIRTY GRAY MEALY DOLD LS SLI-FOSS CHK - NS NO ODOR

60 MURDY GRAY SUCR DOLD FN-XLN POOR & - NS NO ODOR

13) DIRTY GRAY SUCR DOLD FN-GR POOR & - NS NO ODOR

30 MIN: LOTS PURE WH CHK & LT GRAY-WH SHARP AS - NS

122' SLOAN = 5% O, 95% M  
157' T.F.  
SIP: 973-934  
IFP: 17-71 FFP: 75-84  
TEMP: 121°

DST #17 4490'-4520'  
30-45-30-45  
IF: WSB BUILT TO 1/2"  
FF: NO BLOW-FLUSH-NO BLOW  
REC: 10' osp Mud = 1% O, 99% M  
SIP: 71-56  
IFP: 12-15 FFP: 16-19  
TEMP: 120°

Visc: 52  
WT: 9.4

20 WH CHK DOLD & LS ALSO LT GRAY SEMI OPAQUE Δ - NS NO ODOR

30 WH CHK DOLD & WH Δ POOR & NS NO ODOR SOFT CHK

40 LT TAN FN-XLN DOLD w/ GLAC INCLUS POOR & - NS

30 MIN: LT GRAY-WH SKEULS Δ POOR & - NS NO ODOR

LOST CIRC WHILE CFS. PULLED 6 STDS MIXING PRE-MIX HULLS TOOK 10K OFF & LWR PSI TO 600# REGAINED CIRC - SHORTLY AFTER ADDING PRE-MIX MUD. CO. OK



AST  
15/

40

CFS → N

RTD 4640

LTD 4641

VISC: 62 FILT: 8.0  
WT: 9.2 LCM: 4#  
CHL: 1,500 PH: 10.5