GL02528-DOC4

EXPLORATION LOGGING

A GEOLOGICAL ENGINEERING SERVICE

REMARKS

DRILLING CONTRACTOR: NOBLE DRILLING CO. RIG NO: E-1011
MUD: 11 AM 6/13/76
GEL WATER

CASING RECORD

30" @ 53'
16" @ 786'
10 3/4" @ 3974'
HOLE SIZE
9 5/8" @ 3974'
8 7/8" @ T.D.

ABBREVIATIONS

NB NEW BIT
RRB REROCK BIT
CB CORE BIT
CR CIRCULATE RETURNS
NR NO RET. MUD
PR POOR RETURNS
LAT LOGGED AFTER TRIP
TG TRIP GAS
CG CONNECTION GAS
C CAVINGS
DST DRILL STEM TEST
I DST INTERVAL
R CORE INTERVAL
W MUD WEIGHT
V MUD VISCOSITY
F MUD FILTRATE @ CC 30 MIN
FC FILTER CAKE
SD SAND CONTENT
S SALINITY e.g. 25 PPM CL-
R RESISTIVITY OF MUD
RF RESISTIVITY MUD FILTRATE

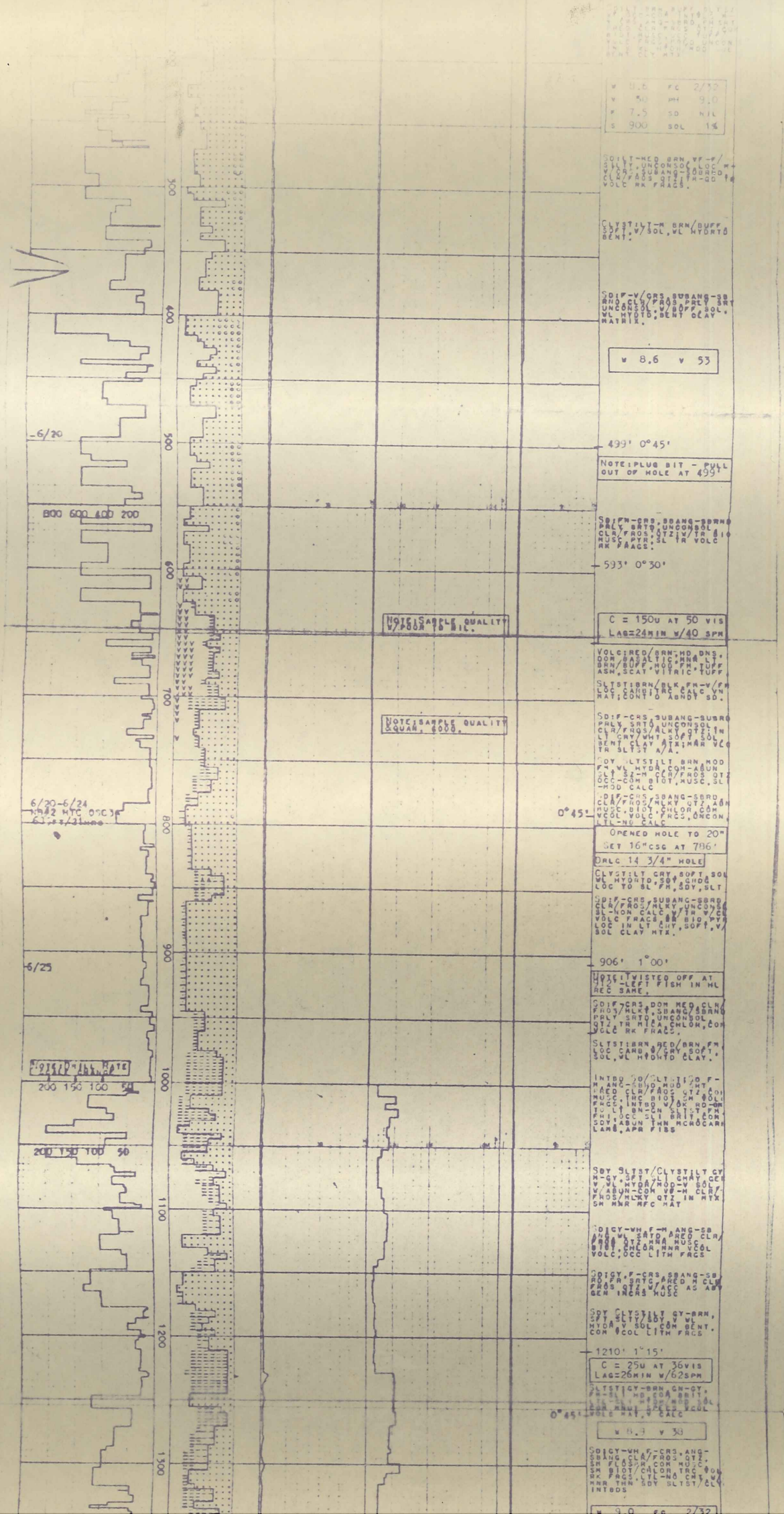
LITHOLOGY SYMBOLS

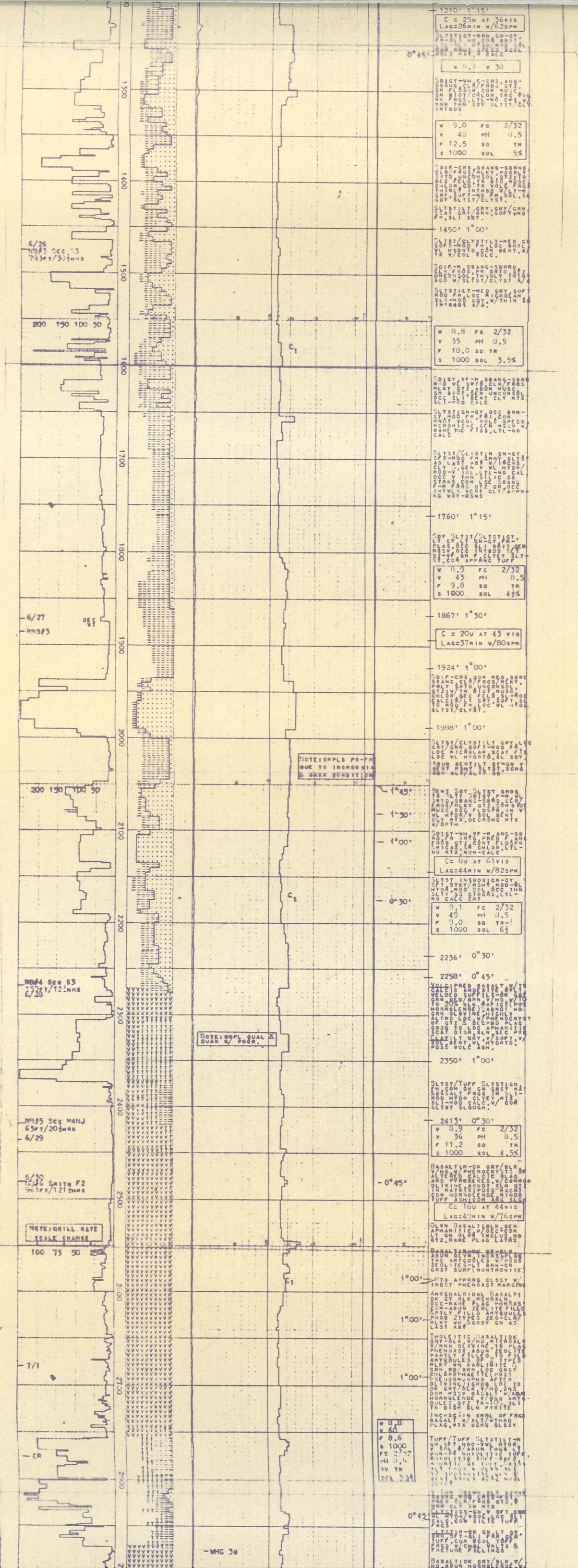
SHALE, SILTSTONE, SANDSTONE, LIMESTONE, DOLOMITE, ANHYDRITE, GYPSUM, SALT, TUFF

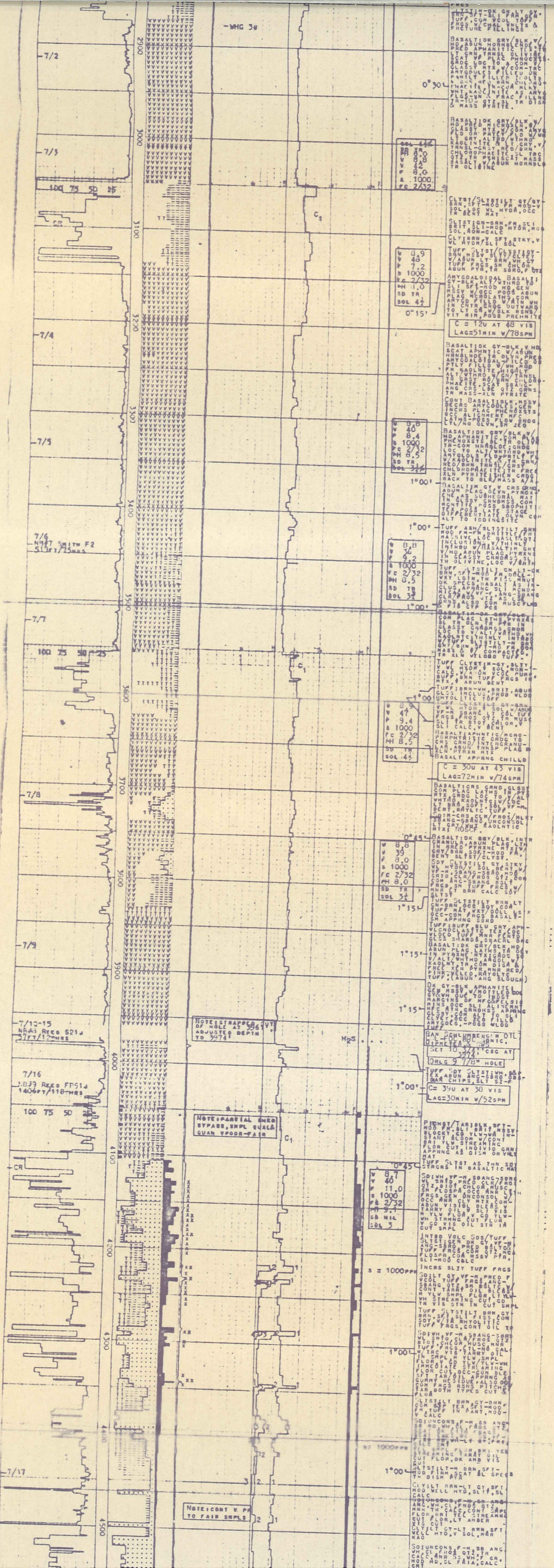
COMPANY	MITCHEL T. HALBOUTY
WELL	"J.N. JAMES" NO. 1
FIELD	MERIDIAN AREA
LOCATION	FROM SE COR 825' N & 510' E SEC. 27, T4N-R1W, B.M.
COUNTY, STATE	ADA COUNTY, IDAHO
API WELL INDEX NO	
ELEVATION	2551'(GL)
DATE	FROM 6/19/76 TO 9/24/76
DEPTH	FROM 53' TO 14,000'
UNIT NO	116'
LOGGING GEOLOGISTS	JOHN HINER, DAVE FINNELL, Mike Kashuba

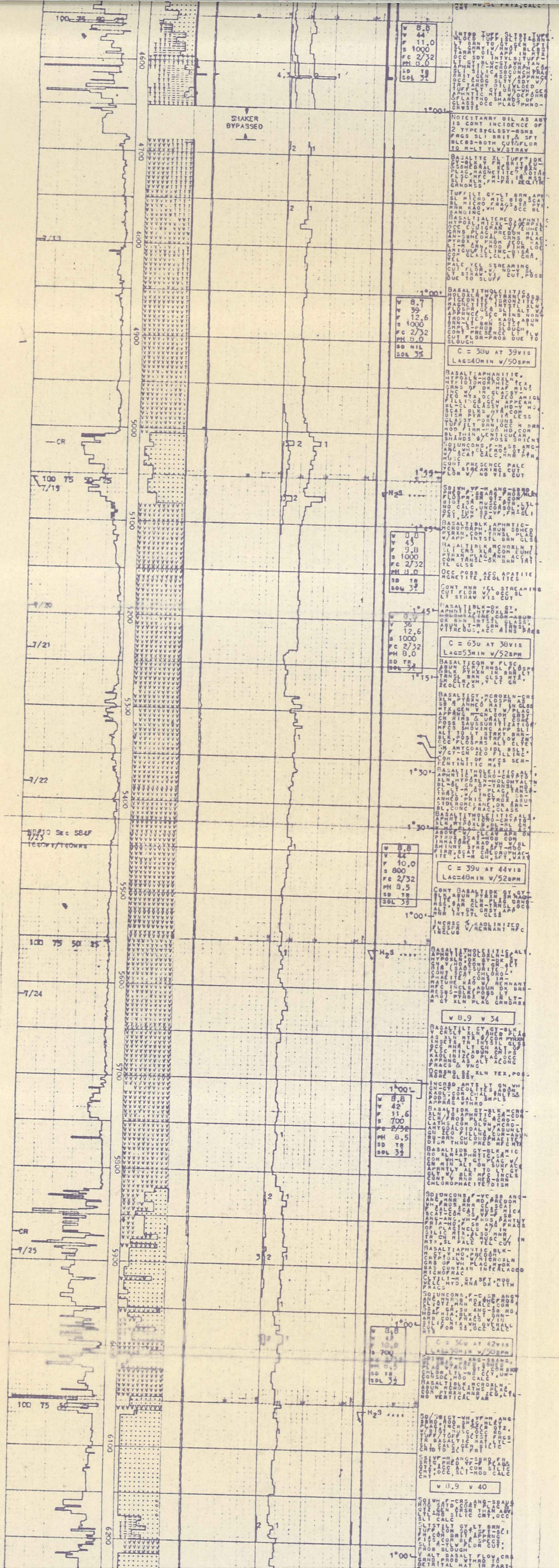
EXPLORATION LOGGING — MUD RATE AND DATA

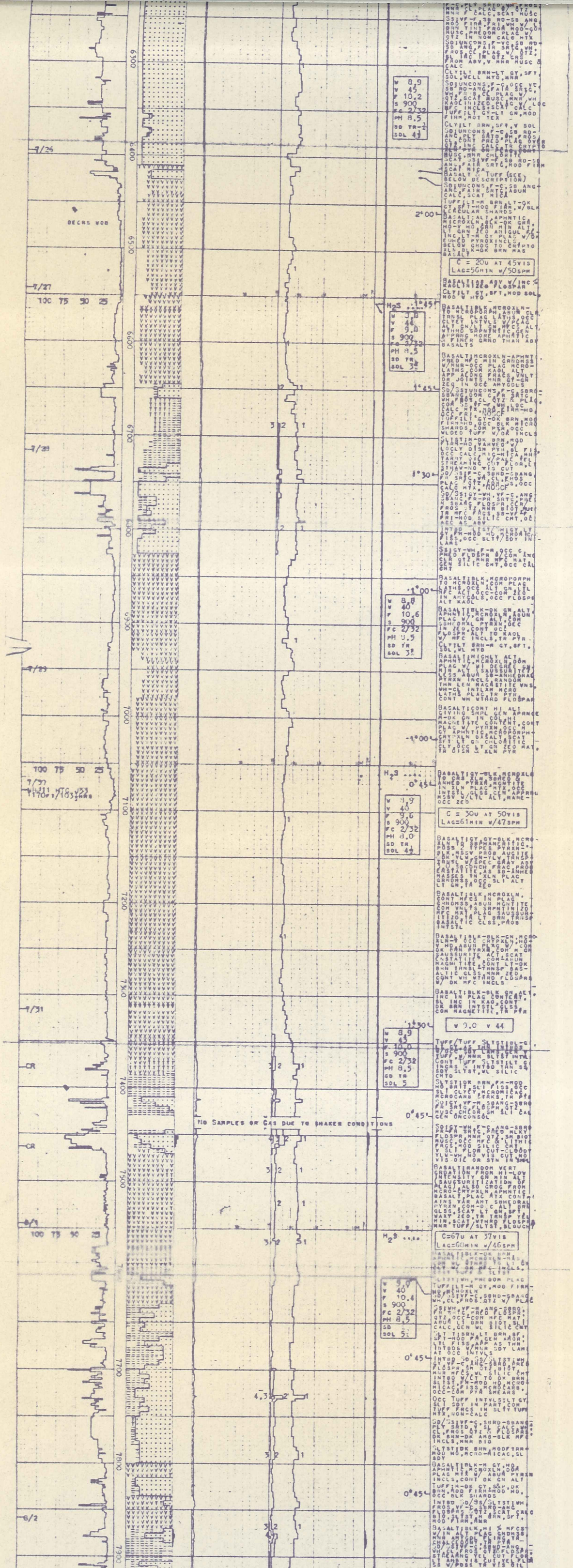
DEPTH | LITHOLOGY | OIL | DRILLING MUD: CONTINUOUS DITCH GAS / CHROMATOGRAPHIC ANALYSIS | CUTTINGS: GAS | REMARKS AND LITHOLOGY DESCRIPTION

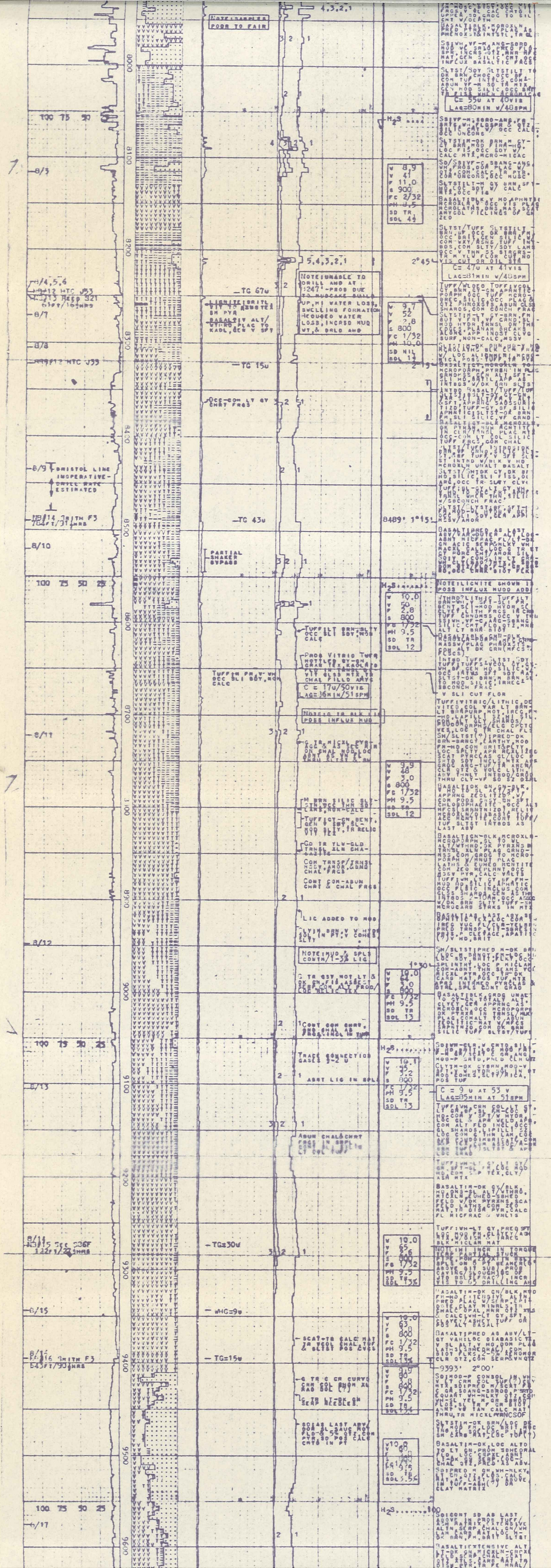


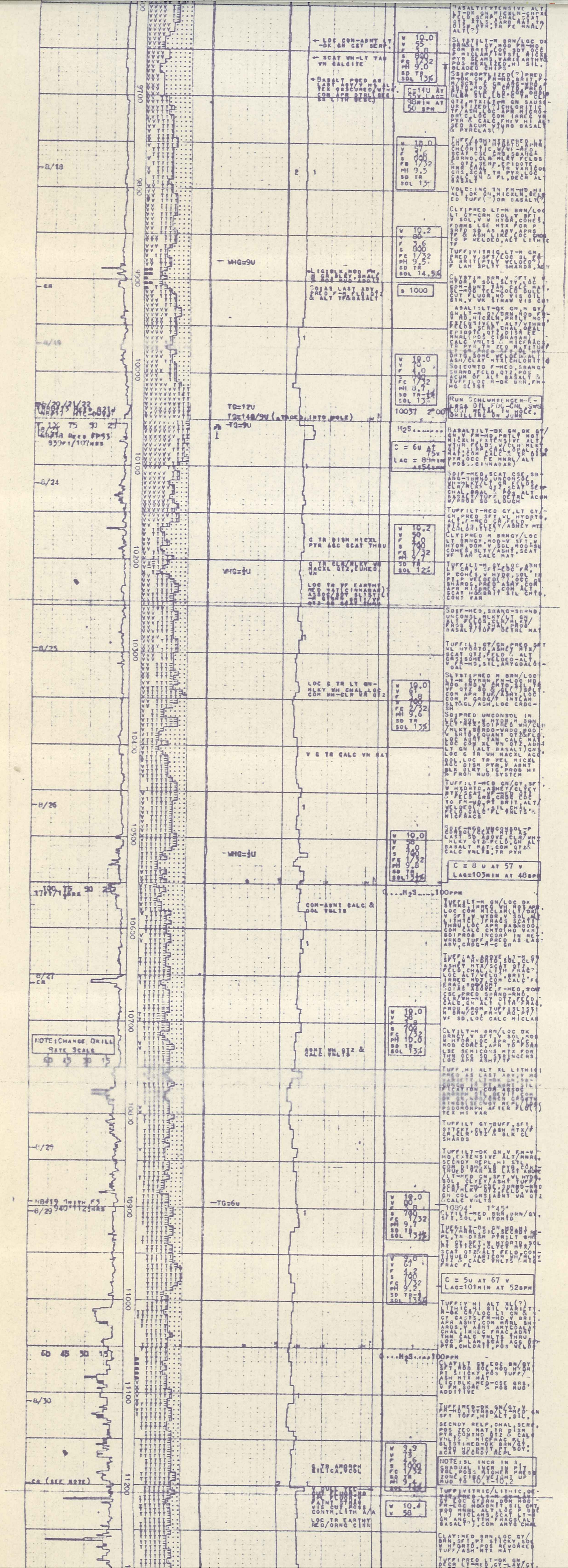

1210' 1°15'
C = 25U AT 36VIS
LAG=26MIN W/62SPM
1450' 1°00'
1760' 1°15'
1867' 1°30'
C = 20U AT 43 VIS
LAG=37MIN W/80SPM
1924' 1°00'
1988' 1°00'
NOTE: SMPLS PR-FR DUE TO INCREASING & BREA CONDITION
1°45'
1°30'
1°00'
C = 8U AT 61VIS
LAG=44MIN W/82SPM
0°30'
2236' 0°30'
2258' 0°45'
2350' 1°00'
2413' 0°30'
C= 16U AT 44VIS
LAG=49MIN W/76SPM
0°45'
1°00'
1°00'
1°00'
0°45'
NOTE: DRILL RATE SCALE CHANGE
100 75 50 25
200 150 100 50
6/26
6/27
6/28
6/29
6/30
7/1
CR
C1
-WHG 3#
1300
1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
2500
2600
2700


-WHG 30
7/2
7/3
7/4
7/5
7/6
N987 SMITH F2
7/7
7/8
7/9
7/10-15
NBAJ REED S21J
7/16
JBJJ REED FP51J
7/17
100 75 50 25
2900
3000
3100
3200
3300
3400
3500
3600
3700
3800
3900
4000
4100
4200
4300
4400
4500
CR
TT
C1
C2
0°30'
0°15'
1°00'
0°45'
1°15'
W 8.9
V 48
F 7.2
B 1000
FC 2/32
MH 1.0
SD TR
SOL 4½
W 8.8
V 40
F 8.4
B 1000
FC 2/32
MH 8.5
SD TR
SOL 3½
W 8.8
V 36
F 9.2
B 1000
FC 2/32
MH 8.5
SD TR
SOL 3½
W 8.8
V 47
F 9.4
B 1000
FC 2/32
MH 8.5
SD TR
SOL 4½
W 8.8
V 39
F 8.0
B 1000
FC 2/32
MH 8.0
SD TR
SOL 3½
W 8.7
V 40
F 11.0
B 1000
FC 2/32
MH 9.1
SD NIL
SOL 3
C = 12U AT 48 VIS
LAG=51MIN W/78SPM
C = 30U AT 43 VIS
LAG=72MIN W/74SPM
C= 39U AT 38 VIS
LAG=30MIN W/52SPM
S = 1000PPM
NOTE: STRAPPED OUT OF HOLE AT 3965' ADJUSTED DEPTH TO 3974'
NOTE: PARTIAL BYPASS, SMPL QUALS QUAN VPOOR-FAIR
NOTE: CONT V PR TO FAIR SMPLS
H2S
SET 10 3/4" CSG AT 3974'
DRLG 9 7/8" HOLE

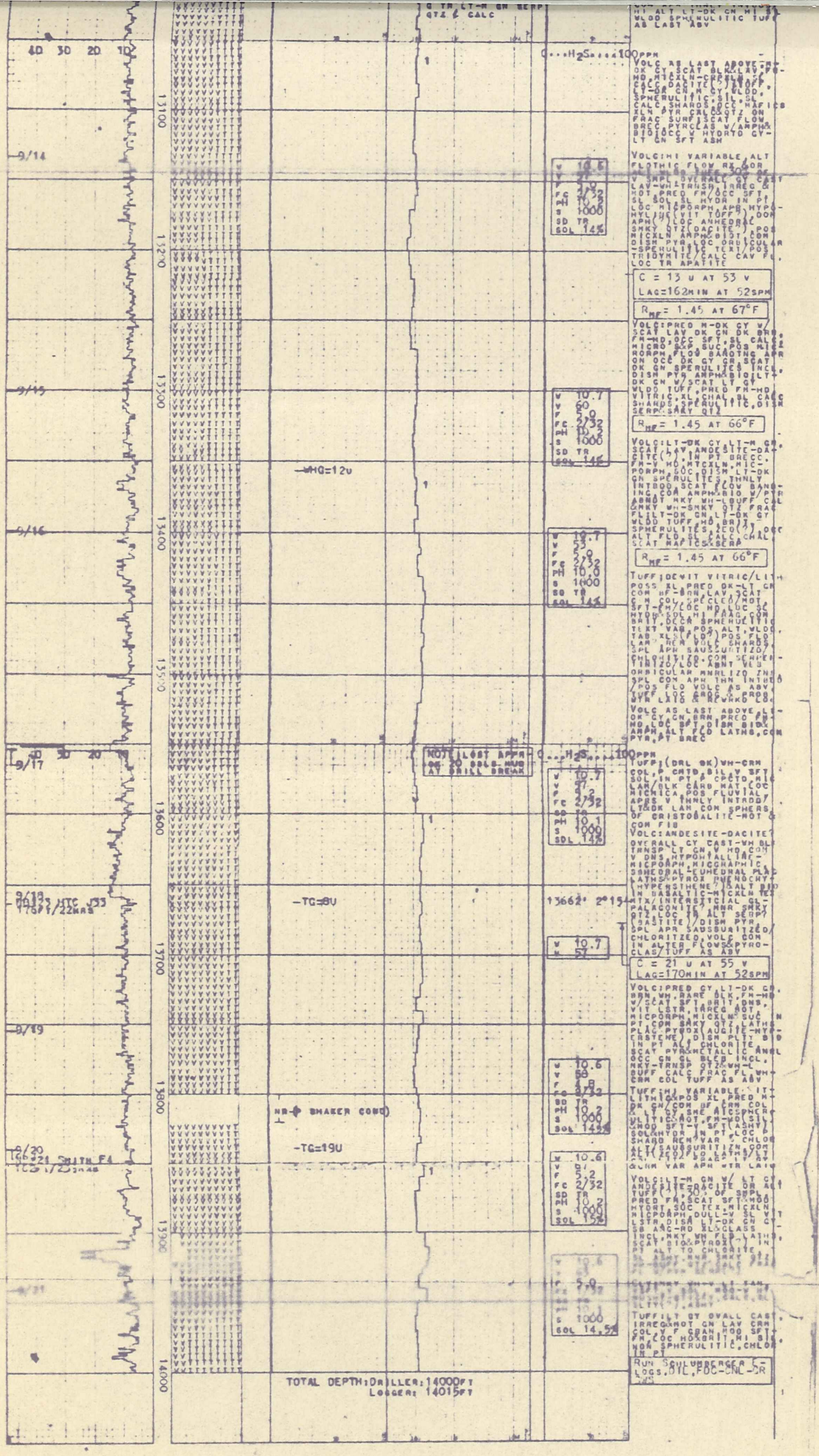

SHAKER BYPASSED
—CR
H_2S
7/19
7/20
7/21
7/22
7/23
7/24
7/25
4600
4700
4800
4900
5000
5100
5200
5300
5400
5500
5600
5700
5800
5900
6000
6100
6200
100 75 50 25


6900
6800
6600
6500
6700
6900
7000
7100
7200
7300
7400
7500
7600
7700
7800
7900
9/24
9/27
9/28
9/29
9/30
9/31
8/1
8/2
DECRS WOB
100 75 50 25
W 8.9
V 45
F 10.2
S 900
Fc 2/32
PH 8.5
SD TR-1/2
SOL 4%
W 8.9
V 44
F 9.8
S 900
Fc 2/32
PH 8.5
SD TR
SOL 3%
W 8.8
V 46
F 10.6
S 900
Fc 2/32
PH 8.5
SD TR
SOL 3%
W 8.9
V 46
F 9.6
S 900
Fc 2/32
PH 8.0
SD TR
SOL 4%
W 8.9
V 45
F 10.0
S 900
Fc 2/32
PH 8.5
SD TR
SOL 5%
W 8.9
V 46
F 10.4
S 900
Fc 2/32
PH 8.5
SD
SOL 5%
2°00
1°45
1°30
1°00
0°45
0°45
0°45
0°45
C = 20u AT 45VIS
LAG=56MIN w/50SPM
C = 30u AT 50VIS
LAG=61MIN w/47SPM
C=67u AT 37VIS
LAG=68MIN w/46SPM
W 9.0 V 44
NO SAMPLES OR GAS DUE TO SHAKER CONDITIONS


NOTE: SAMPLES POOR TO FAIR
4,3,2,1
8000
100 75 50
H2S
8100
8/3
C= 55U AT 40VIS
LAG=80MIN W/48SPM
w 8.9
v 41
F 11.0
s 900
FC 2/32
SD TR
SOL 4½
SLTST/SDY SLTSTILT TO DK BRN CHOC OCC BF, COM TUF INTBDS COM-ABUN VF-M SD IN MTX
SS: VF-M, SBRD-ANG, FR SRTG, WH, FLDSPR & QTZ, SILIC CMT W/ OCC CALC, OCC UNCONS
SLTST: M-DK BRN, M GY-GY BRN, MOD FIRM-HD, LOC FIS, OCC SDY W/ CALC MTX, MCRO-MICAC
SD/SS: VF-C, SBANG-ANG, WH, FROS, DOM PLAG W/ QTZ, COM CALC, TR PYR, COM UNCONS, OCC MUSC
SLTST: LT-M GY BRN, SFT-HD, LOC SDY W/ CALC MTX, OCC FIS
BASALT: BLK, V HD, APHNTC MCROXLN, OCC VIS PLAG MCROLATHS, DNS, MAS, SCAT AMYGDL FILLINGS OF GN ZEO
8200
5,4,3,2,1
2°45'
C= 47U AT 41VIS
LAG=81MIN W/48SPM
NOTE: UNABLE TO DRILL AND AT 8247' - PROB DUE TO MUDCAKE BUILD UP, HI WATER LOSS, SWELLING FORMATION. REDUCED WATER LOSS, INCRSD MUD WT, & DRLD AHD
TG 67u
8/4,5,6
8/7
8/8
HTC J33
HTC J33
w 9.7
v 52
F 2.8
s 800
FC 1/32
pH 10.0
SD NIL
SOL 1½
BASALTIV ALT/ WTHRD, PLAG TO KAOL, GEN V SFT
8300
TG 15u
OCC-COM LT GY CHRT FRGS
8400
8/9 BRISTOL LINE INOPERATIVE - DRILL RATE ESTIMATED
TG 43u
8489' 1°15'
8500
8/10
PARTIAL SHAKER BYPASS
BASALT: PRED AS LAST ABV
100 75 50 25
NOTE: LIGNITE SHOWN IS POSS INFLUX MUD ADD
w 10.0
v 50
F 2.8
s 800
FC 1/32
pH 9.5
SD TR
SOL 12
8600
TUFF: LT BRN, SLTY OCC SLI SDY, NON CALC
PROB VITRIC TUFF
TUFF: M FM, V WH, OCC SLI SDY, NON CALC
C = 17u/50VIS
LAG=36MIN/51SPM
V SLI CUT FLOR
8700
POSS INFLUX MUD
8/11
TUFF: VITRIC/LITHIC
w 9.9
v 48
F 3.0
s 800
FC 1/32
pH 9.5
SD TR
SOL 12
8800
M BRN SILIC SLTSTN, OCC THN SDY LAMS, NON-CALC
GD TR YLW-GLD TRNSL XLN CHALCEDONY
COM TRNSP/TRNSL MSDY, AMOR, & GND CHAL FRGS
CONT COM-ABUN CHRT & CHAL FRGS
8900
LIG ADDED TO MUD
8/12
NOTE: MUD & SPLS CONTM/1-3% LIG
1°30'
w 10.0
v 64
F 3.0
s 800
FC 1/32
pH 9.5
SD TR
SOL 13
9000
CONT COM CHRT, AND CHAL AS FRGS
100 75 50 25
TRACE CONNECTION GASES 3-2 U
ABNT LIG IN SPLS
H2S
w 10.1
v 55
F 3.2
s 800
FC 1/32
pH 9.5
SD TR
SOL 13
9100
8/13
C = 9 U AT 53 V
LAG=85MIN AT 51SPM
ABUN CHAL&CHRT FRGS IN SMPL
9200
BASALT: M-DK GY/BLK
TUFF: WH-LT GY
8/14
TG=30u
w 10.0
v 65
F 2.6
s 800
FC 1/32
pH 9.5
SD TR
SOL 13½
9300
8/15
WHG=9u
w 10.0
v 63
F 2.8
s 800
FC 1/32
pH 9.5
SD TR
SOL 13½
SCAT-TR CALC MAT IN VCOL CHAL, TUF & SLTST POS CVGS
8/16 SMITH F3
543FT/90½HRS
TG=15u
9400
9393' 2°00'
w 9.9
v 80
F 2.8
s 800
FC 1/32
pH 9.5
SD TR
SOL 13½
G TR C GR CURVD
G TR LT-DK GN SERP NEEDLES
SD: AS LAST ABV
9500
SLTST: M-DK BRN
BASALT: M-DK, LOC ALTD
w 10.0
v 60
F 3.0
s 800
FC 1/32
pH 9.5
SD TR
SOL 13.5
100 75 50 25
H2S 100
8/17
SD: CONT SD AS LAST ABOVE
BASALT: EXTENSIVE ALT
9600


9700
9800
9900
10000
10100
10200
10300
10400
10500
10600
10700
10800
10900
11000
11100
11200
8/18
CR
8/19
8/20/21/22
8/24
8/25
8/26
8/27 CR
8/29
8/30
CR (SEE NOTE)
NOTE: CHANGE DRILL RATE SCALE
60 45 30 15
100 75 50 25
NB#19 SMITH F5 940' 112HRS
WHG=9U
WHG=½U
TG=12U
TG=140/9U (STACKED INTO HOLE)
TG=9U
TG=6U
← LOC COM-ABNT LT-DK GN CSY SERP.
← SCAT WH-LT TAN VN CALCITE
← BASALT PRED AS LAST ABV/V HI ALT, TEX OBSCURED/WTHR, COM APR DTRL (SEE SS LITH DESC)
LIG: BLK, MOD FM, SL CR, BLKY, SMAL, POS MUD ADDIT
SD: AS LAST ABV, PRED F-M, FLD QTZ & ALT TF&BASALT
G TR DISM MICXL PYR ASC SCAT THRU
G TR CLR/MLKY WH MACXL QTZ, EUHED, VN
LOC TR VF EARTHY RED MAT (CINNABAR)
LOC G TR LT GN-MLKY WH CHAL LOC COM WH-CLR VN QTZ
V G TR CALC VN MAT
COM-ABNT CALC & DOL VNLTS
ABNT WH QTZ & CALC VNLTS
G TR AMORPH SILICA, VCOL
V DULL YEL CUT FLUOR, NO FL, FAINT STRAW VIS CUT, POSS CONTM, LITH A/A
LOC TR EARTHY RED/ORNG CINN
W 10.0 V 55 F 3.8 S 800 FC 1/32 PH 9.0 SD TR SOL 13%
C=14U AT 55V, LAG=98MIN AT 50 SPM
W 10.0 V 57 F 3.6 S 800 FC 1/32 PH 9.5 SD TR SOL 13%
W 10.2 V 80 F 3.6 S 800 FC 1/32 PH 9.5 SD TR SOL 14.5%
S 1000
W 10.0 V 70 F 4.0 S 700 FC 1/32 PH 8.7 SD TR SOL 13%
10037 2°00'
H2S
C = 6U AT 75V, LAG = 88MIN AT 54SPM
W 10.2 V 50 F 3.0 S 700 FC 1/32 PH 9.7 SD TR SOL 12%
W 10.0 V 61 F 3.8 S 700 FC 2/32 PH 9.6 SD TR SOL 13%
W 10.0 V 58 F 3.0 S 700 FC 1/32 PH 9.8 SD TR SOL 13%
C = 8 U AT 57 V, LAG=103MIN AT 48SPM
0...H2S....100PPM
W 10.0 V 58 F 3.8 S 700 FC 1/32 PH 10.0 SD TR SOL 13%
W 10.0 V 60 F 3.8 S 700 FC 1/32 PH 9.7 SD TR SOL 13%
W 9.8 V 67 F 4.2 S 700 FC 1/32 PH 9.2 SD TR SOL 13%
C = 5U AT 67 V, LAG=101MIN AT 52SPM
10894' 1°45'
W 9.9 V 73 F 4.6 S 1900 FC 1/32 SD TR PH 9.4
W 10.4 V 58
BASALT: EXTENSIVE ALT, LT-DK GN, MICXLN-CRPXL, FELD, SERP, CHAL, SCAT QTZ XTLS, CARB MAT, TR DISM PYR, TR FE MNRL/ALT(?)
SLTST: LT-M BRN/LOC DK BRN & LT GY, MOD FM-HD, COM BRIT, LOC SDY, OCC P MICLAM/INTSTL BLCK PYR SEAMS, VARI EARTHY, POS REALTIZED, HI SIL, BLADED CHIPS
SS: PROPYLTIZED(?) PRED M-DK GN, FM-HD, BRIT, F-M/SCAT C GR, ANG-VRD, P SRTD, MOD V CHTD, PRED QTZ, CLR FLD, COM GRN, QTZ, MTX: LT-M GN SAUSSURITIZED(?) CHLORITIC TF/ASH, LOC APR MICROBRIT, LOC COM IRREG VN PYR & CALC, FM-V HI ALT, SED ACUM V/ORD BASALT & PYRCLAS(?)
TUFF/ASH: MTX, PRED LT GN, SFT, V HYDRTD, APRN CHLORITIC, W/VF-MED SCAT CSE GRS, SBANG-SBRND, CLR MLKY FELDS & QTZ, SERP, EPIDOTE, MNR CHAL, TR VARI COL GRS, SCAT TR PYR, LOC CALC VN & FL, DECR ALT BASALT
VOLC: INC IN FM-HD, HI ALT, DK GN, MICXLN, BEDDED TUFF(?) OR BASALT(?)
CLY: PRED LT-M BRN/LOC LT GY-CRM COL, V SFT, V SOL, V W HYDR, COHES, FORMS LSE MTX FOR P SRTD SD AS ABV, APRS TF & ASH LIKE, LOC GRDG TO P WELDED, ALT LITHIC TF
TUFF: VITRIC, LT-M GN, PRED V SFT/LOC SL FM & BRIT (PTLY WELDED?), F LAN SPLTY SHARDS, ASHY
CLYST: M BRN, V SFT, V W HYDR, V SOL, SLTY, LOC COM-ABNT TAN CALC MAT, SL-MOD YEL-GOLD DULL CUT FLUOR, NO VIS OIL STN, V WK STRAW VIS CUT
BASALT: LT-DK GN, M GY/GN, LT-M GY/BRN, MOD FM-V HD, MICXLN, PRTLY MOT, EXTENSIVELY ALT/WTHRD FELDS, SERP, CHAL, OPAL, EPIDOTE, QTZ, DISM FE MNRL (POS CINNABAR), CALC VNLTS & MICFRACS, TR PYR, TR ZEO MAT, TUFF: LT GN, PRED SFT, SL HYDRTD, SOME WELDED & ALT ASH/CLAY MTX (CHLORITIC)
SD: CONTD F-MED, SBANG-SBRND, FELD, QTZ, POS ACUM OF ALT BASALT & TUFF, LOC M-DK BRN, FM-HD SLTST
RUN SCHLUMBERGER E-LOGS DIL FDC-CNL SWS, LOST METAL IN HOLE, DRILLING ON JUNK
BASALT: LT-DK GN, DK GY/GN, V FM-HD, PRTLY MOT, MICXLN, EXTENSIVE ALT, WTHR FELDS W/CLR MLKY QTZ, SERP, CHAL, OPAL, ZEO MAT, COM CALC & TR DISM PYR, OCC FE MNRL/ALT (POSS CINNABAR)
SD: F-MED, SCAT CSE, SBANG-SBRND, UNCONSOL, WH-MLKY/LT GN FELDS, CLR/MLKY QTZ, SCAT SERP, CHAL, OPAL & POS ALT BASALT/TUFF DETRL ACUM W/PROB SD SLOUGH
TUFF: LT-MED GY, LT GY/GN, PRED SFT, WL HYDRTD, ALT, F-MED CA FELD & QTZ IN CLYEY/ASHEY MTX (CHLORITIC)
CLY: PRED M BRNGY/LOC LT BRNGY, MOD-V SFT, W HYDR, DOM V SOL, MOD-SL COHES, SLTY/ASHY, SCAT VF TAN CALC MAT
TUFF: LT-M GY, LOC ABNT LT GN, V SFT-LOC FM, P COHES, W HYDR, SOL IN PT, P WELDED(?), OCC GL SHARDS, PRED ASHY, COM APR MICBREC, COM ALT, SCAT HD&BRIT SIL CHTD, CONT VAR
SD: F-MED, SBANG-SBRND, UNCONSL, MLKY/LT GN, ALT FELDS, CLR/MLKY, FROS QTZ, CHAL, PROB BASALT/TUFF DETRL MAT
TUFF: LT GY/GN, PRED SFT, WL HYDRTD, ASHEY MTX/SCAT QTZ, FELD & ALT GRS; SOME WELDED-ALT, V FM-HD, SIL, AMYGDALOIDAL
SLTST: PRED M BRN/LOC LT-M GYBRN, FM-LOC HD, MOD IND, V CHTD, SIL, TR VF QTZ SD & CLY(?), SPLTY, COM APR TUF/ASHY, LOC COM P GRDG/F INTLAM SLT&CL/ASH, LOC GRDG-SH
SD: PRED UNCONSOL IN LSE, SOL, V HYDR, M BRN CLY MTX; SD: PRED WH/CLR/MLKY, SBRDD-VRDD, MOD V SRTD, EQUANT QTZ&FLD, LOC ABNT TAN CALC MAT, LOC COM XL VN QTZ, ABNT LT GN (ALT BASALT) GNS, LOC G TR WH MACXL ACC DOL, LOC TR YEL MICXL ACC DISM PYR, V ABNT BLK BLKY LIG, PROB MI % FROM MUD SYSTEM
TUFF: LT-MED GN/GY, SFT, W HYDRTD, ASHEY/CLYEY MTX, SCAT VF-MED QTZ & FELD GRS, GRDG LOC TO FM-HD, PT BRIT, ALT, WELDED(?), SIL, CHAL, FELD, CALC FL VNLTS & MICFRACS
SD: F-MED, UNCONSOL-P CONSOL/CLAY MTX AS LAST SD ABOVE, CLR/WH-MLKY QTZ, FELD, GN ALT BASALT MAT, COM QTZ & CALC VNLTS, TR PYR
TUFF: LT-M GN/LOC DK STRKS, IRREG WH MOT, APR LOC COM MICLAM (LT/DK), V SFT, V HYDR, V SOL, ALT LITHIC(?) FRAGS SCATT THRU, LOC APR BAS&BOD, COM CALC CMTD (MD VAR), SD: PROB INCORP IN REWRKD TUFF, PRED AS LAST ABV, GRDG-M-C GR
TUFF: AS ABOVE, LT-M GY, SFT, V HYDRTD, SOL CLY/ASHEY MTX/SCAT QTZ, FELD, CHAL, LITH FRAG?, LOC ALT/WELD?, BRIT, IRREG MOT, COM CALC FL FRAC, BOD/CHT
SD: AS ABOVE, F-MED, SCAT CSE, PRED SBANG-RND, CLR/WH-MLKY QTZ, FELD, CALC, GN ALT LITH FRAG, PROB FROM TUFF; SLTST: M BRN/GY, FM-V HD, PT/VF SD, LOC CALC MICLAM
CLY: LT-M BRN/LOC DK BRNGY, V SFT, V SOL, MOD W HYDR, LOC APR CALC, MOD COHES, APR TO FORM LSE SEMICONS MTX FOR THN OCC SD STRINGERS, LOC APR ASHY/TF
TUFF, HI ALT XL LITHIC: PRED AS LAST ABV, V HD VARIETY, LT-DK GN, SECOND IN PT, ABNT SILICIFICATION, COM ASSOC AMORPH SIL DEVIT, COM DK GN MOD/GREEN GROWTH RINGS (SECNDY REPL/DEPOS), PSDOMORPH AFTER FLD(?), TEX HI VAR
TUFF: LT GY-BUFF, SFT, STICKY, CLY/ASH MTX/F GR, CLR QTZ & BLK GL SHARDS
TUFF: LT-DK GN, V FM-V HD, EXTENSIVE ALT/MNRL, SECNDY REPL, HI SIL, COM DISM XLN PYR, CONTINUED VAR AS LAST ABOVE /LT-MED GN, SFT, WL HYDR, SOL, CLYEY/ASHY TUFF, SCAT F-V CSE, SBRND-RND CLR/MLKY QTZ, FELD, VAR GN COL GRS; ABNT WH QTZ & CALC VNLTS
CLY: LT-MED BRN, BRN/GY, SFT, SOL, V HYDRTD
TUFF: LT-DK GN, MOD HI ALT/MNRL, SIL, SECNDY REPL, TR DISM PYR; LT GN, LT GY, SFT, V HYDRTD, SOL, PT STICKY/CLYEY MTX/SCAT QTZ & ALT FELD, CONTINUED VAR, COM WH/MLKY QTZ & CALC VNLTS & MICFRAC FL
TUFF: V HI ALT XL(?) LITHIC, HI SIL VARIETY, M-DK GN/LOC LT GN & GY CASTS, FM-HD, V BRIT, APR ASHY, COM MNRL SHARDS, V ABNT AMYGDALAS, CHAL, IRREG FRAC, ABNT THN CALC VNLTS THRU, LOC P LAM, SCAT ACC PYR, CHLORIT, POS WELDED
CLAY: LT GY, LOC BN/GY, SFT, MOD SOL, MOD HYDR, PT STICKY, POS TUFF/ASH MTX MAT
LIG: BLK, MED-CSE GRS, V FM, SOME % POS MUD ADDITIVE
TUFF: MED-DK GN/GY, V FM-HD, INTBDD/LT-MED GN SFT TUFF, HI ALT, SIL, SECNDY RELP, CHAL, SERP, POS ZEO MAT, TR DISM PYR, CONTND QTZ & CALC VNLTS & MICFRAC FL
SLTST: MED-DK BRN/GY, MOD HD, BRIT, PT SDY, SCAT SECNDY REPL
NOTE: SL INCR IN S, GRADUAL INCR IN PIT VOL, POSS HIGHER PRES ZONE, CIRC/WEIGHT UP MUD TO 10.1-10.2
TUFF: VITRIC/LITHIC, OCCUR, PRED LT-M GY-LAV GY, LOC GYBRN, DOM MOD FM-LOC HD&BRIT, SIL CMT, MOD MNRL ALT, LOC P UDG(?) MICLAMS, SCAT LT-M GN ANG LITH FRAGS (ALT BASALT?), COM AMYG CHAL
CLAY: MED BRN, LOC GY/BRN, SFT, PT STICKY, SOL, W HYDRTD, POS REWORKED TUFF/ASH MTX MAT
TUFF: PRED LT-DK GN, DECR LT-MED/GY-LAV/GY

11300
11400
11500
11600
11700
11800
11900
12000
12100
12200
12300
12400
12500
12600
12700
12800
12900
9/1
9/2
9/3
9/4
9/5
9/6
9/7
9/8
9/9
9/10
9/11
9/12
9/13
60 45 30
WHG=8u
WHG=8U
WHG=11u
TG=15u
WHG=16u
TG=13u
C = 6 U AT 75 V
LAG=106MIN AT 52SPM
C = 8u AT 56 V
LAG=108MIN AT 52SPM
C = 10 u AT 53 V
LAG=122MIN AT 51SPM
C = 25 U AT 43 V
LAG=130MIN AT 52SPM
C = 18 U AT 53 V
LAG=151MIN AT 51SPM
C = 6 U AT 68 V
LAG=155MIN AT 50SPM
R_MF = 1.3 AT 75°F
R_MF=1.45 AT 62°F
R_MF=1.15 AT 77°F
R_MF=1.5 AT 62°F
R_MF = 1.25 AT 77°F
12900' 1°45'
NOTE: CHANGE DRILL RATE SCALE



MICHEL T HALBOUTY
J.N. JAMES #1
Sec 27, T4N-R1W
ADA COUNTY, IDAHO

COMMENTS PERTAINING TO HYDROCARBONS IN INTERVAL 4105-4395

1. CONCERNING CEMENT AND GILSONITE

CASING WAS SET AT 3974, IN BASALT. CASING SHOE WAS SET ON BOTTOM AND THE LEAD CEMENT PLUG WAS LIGHTENED WITH 10LBS/SACK GILSONITE. THE TAIL END SLURRY CONSISTED OF 350SACKS CLASS G CEMENT WITH 10% SALT(NO GILSONITE), AND DISPLACED THE GILSONITE-LADEN CEMENT AROUND THE SHOE. THEREFORE, THEORETICALLY NO GILSONITE WAS PRESENT IN THE CEMENT AT THE SHOE, AND THE CEMENT THAT WAS DRILLED UP WAS PUMPED COMPLETELY CLEAR OF THE MUD SYSTEM.

THE PRESENCE OF GILSONITE IN THE STRATIGRAPHIC COLUMN WAS NOT DETECTED UNTIL APPROXIMATELY 15 DRILLING HOURS AFTER PENETRATING THE SHOE. ITS PRESENCE COINCIDED WITH THE INCURRENCE OF MEDIUM BROWN SILTSTONES WITHIN A BASALTIC SECTION, AND OCCASIONALLY THE GILSONITE COULD BE SEEN AS DISSEMINATED GRAINS IN THE SILTSTONE MATRIX.

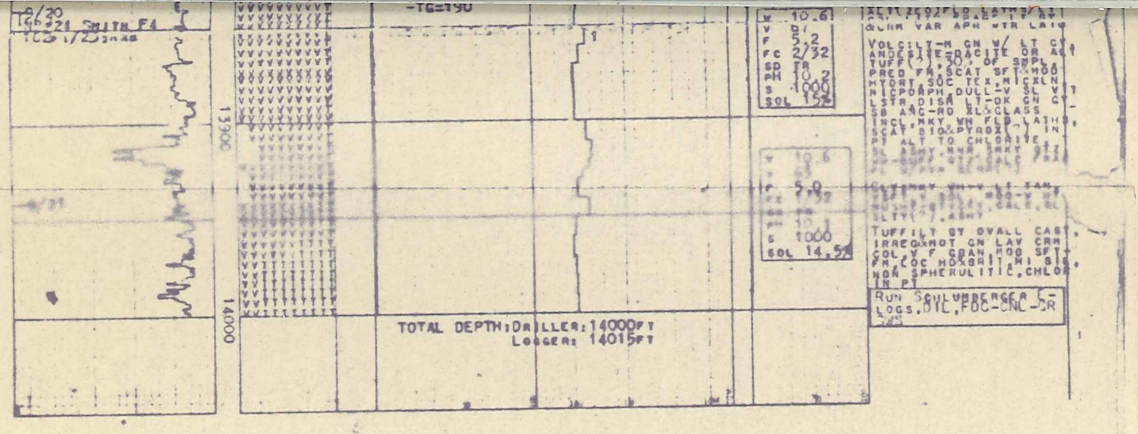
2. LOGGING STYLE

THE AMOUNT AND INTENSITY OF THE "OIL SHOW" COLUMN, AND "X"S REPRESENTING OIL IN MUD HAVE BEEN SLIGHTLY EMPHASIZED IN ORDER TO BRING ATTENTION TO THE PRESENCE OF SOLID HYDROCARBONS IN THE INTERVAL 4105-4395. GENERALLY, LARGER SHOWINGS COINCIDE WITH HEAVIER GAS FRACTION READINGS IN THE CHROMATOGRAPH COLUMN. CUT FLUORESCENCE WAS DEFINITE AND VARIED ACCORDING TO THE PERCENTAGE OF HYDROCARBON MATERIAL IN THE SAMPLES. AS NOTED ON THE MUD LOG, SAMPLE QUALITY WAS IMPAIRED BY SHAKER CONDITIONS, BUT EVALUATION OF LITHOLOGIC AND HYDROCARBON FACTORS INCLUDED CONSIDERATION OF EXISTENT CONDITIONS. STANDARD LOGGING PRACTICE AND EVALUATIVE TECHNIQUES WERE USED TO COMPILE THE LOG, AND VISUAL/FLUORESCENT EXAMINATION OF CUTTINGS AND MUD WERE CONDUCTED AT APPROXIMATELY 10FOOT INTERVALS(AND SHORTER WHEN POSSIBLE).

3. LITHOLOGY

THE SANDS THROUGHOUT THE DRILLED SECTION ARE UNCONSOLIDATED, AS DETERMINED BY DRILL RATE, APPEARANCE ON SHAKER SCREEN, AND CHARACTER UNDER THE MICROSCOPE. NO CEMENTED SANDSTONE OR CONSOLIDATED FRAGMENTS WERE OBSERVED, ALTHOUGH FORMATIONS BELOW APPROXIMATELY 4350 ARE CALCAREOUS. SANDS ARE PREDOMINANTLY OF BATHOLITHIC ORIGIN, WITH THE POSSIBLE EXCEPTION OF 10' OF THIN SAND/SILT INTERBEDS AT 4185-4195, WHICH BY THE PREVALANCE OF BASALTIC AND TUFF FRAGMENTS AS WELL AS BATHOLITHIC MATERIAL MAY REPRESENT A DUAL ORIGIN, OR POSSIBLY REWORKING. THERE IS LITTLE OR NO SILT SIZED TO CLAY MATRIX IN THE SANDS THEMSELVES, BUT INTERBEDS OF TUFFACEOUS SILTSTONE PROVIDE LITHOLOGIC SEPARATION.

THERE ARE TUFFACEOUS SILTSTONES INTERBEDDED WITH BASALTS IMMEDIATELY ABOVE THE SAND BODIES. NEARLY ALL THE SILTSTONES OBSERVED CARRY A MARKED PYROCLASTIC IMPRINT, AND OCCASIONALLY DETERMINATION BETWEEN TUFFACEOUS SILTSTONE AND SILTY TUFF WAS A MATTER OF PERSONAL JUDGEMENT. THE OCCURRENCE AND PERCENTAGE OF BENTONITE(AS DETERMINED BY SAMPLE HYDRATION, VISUAL EXAMINATION, AND MANNER IN WHICH THE SAMPLE



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4. CONCERNING THE OIL
FIRSTLY, IT SHOULD BE MENTIONED THAT THE LIGNITE SYMBOLS AT 4045-4105 REPRESENT THE SAME HYDROCARBONS LOGGED AS "OIL" IN THE LOWER SECTIONS (REFER TO FLUORESCENT CUT COLUMN AND PITCHSTONE/TAR DESCRIPTION AT 4050). THESE SHOWINGS ARE INDIGENOUS TO THE SILTSTONES; A MEDIUM BROWN, SOFT AND SOMEWHAT BRITTLE, THINLY BEDDED SILT WITH MINOR SILT SIZE TO VERY FINE SANDY SEGREGATIONS AS VERY THIN LAMINATIONS WITHIN THE SEDIMENT. THE HYDROCARBON SUBSTANCE WAS OBSERVED IN SILTSTONE AS VERY THIN STREAKS AND MICROLENSES, ALSO AS DISCREET PARTICLES IN THE COLLECTED SAMPLES THEMSELVES. THIS OCCURRED IN SEPARATE INTERVALS 4047-48, 4050-52, 4067-69, AND AT 4096-4105. THERE WAS NO HYDROCARBON MATERIAL IN THE SAMPLE OR ASSOCIATED WITH THE SILTSTONES IN INTERVAL 4075-87.
THE HYDROCARBON SHOWN CONSISTS OF TWO TYPES. BOTH TYPES WERE DETECTED CONTINUOUSLY THROUGH INTERVALS FROM 4105-4395, WITH TRACE AMOUNTS OCCURING BELOW THAT SEQUENCE. THE FIRST TYPE WAS DETECTED AT 4045-4395, OCCURS AS DISCREET SMALL CHIPS THAT ARE FIRM, BRITTLE, GLASSY TO RESINOUS TEXTURE, AND ARE THOUGHT TO HAVE BEEN SEEN IN PLACE IN SILTSTONE MATRIX BOTH BY ME AND THE STANDARD OIL CO. WELLSITE GEOLOGIST. THERE WAS NO FLUORESCENCE BUT ADDITION OF CHLORETHANE PRODUCED A MEDIUM YELLOW SLOW STREAMING CUT FLUORESCENCE, WITH A RESULTANT SLOWLY DEVELOPED DARK AMBER VISIBLE STAIN IN THE FLUID ITSELF.
THE SECOND TYPE WAS FIRST ENCOUNTERED AT 4105, CONTINUING TO 4395, WITH ISOLATED INTERVALS OF INCIDENCE BELOW 4395. IT APPEARS AS A SOFT, GUMMY, PLASTIC TARRY MATERIAL. IT DID NOT FLUORESCE, BUT UPON ADDITION OF CHLORETHANE THERE WAS AN IMMEDIATE STREAMING BRIGHT YELLOW CUT FLUORESCENCE(INITIALLY BORDERING ON A "BLOOM", SETTLING DOWN TO A CONTINUOUS STREAMING ACTION).
NEITHER TYPE WAS OBSERVED AS A STAIN OR AS AN OCCUPANT OF THE INTERSTICES OF ANY COHESIVE SANDSTONE FRAGMENTS, PARTIALLY DUE TO THE LACK OF CEMENTED SAND FRAGMENTS IN THE SAMPLES. NOR WAS THERE ANY OIL OBSERVED IN DIRECT CONTACT OR ATTACHED TO A SINGLE SAND GRAIN, OTHER THAN JUXTAPOSITION CAUSED BY SAMPLE HANDLING; HOWEVER, THE HYDROCARBON WAS READILY APPARENT IN THE SAND SAMPLES. ATTEMPTS TO ISOLATE THE RELATIONSHIP OF SAND TO OIL IN UNWASHED CUTTINGS PROVED FRUITLESS, AND WASHED SAMPLES ONLY SUBSTANTIATED THE UNCONSOLIDATED NATURE OF THE SAND.

OTHER FACTORS INDICATIVE OF THE PRESENCE OF HYDROCARBONS INCLUDE A DEFINITE PRONOUNCED OIL SHEEN ON UNWASHED CUTTINGS(AND IN THE MUD), SOMEWHAT LESS OBVIOUS BUT NONETHELESS STILL VERY VISIBLE IN THE WASHED, STILL WET SAMPLES. ALSO A FACTOR IS THE OCCURRENCE OF HEAVIER GAS FRACTIONS C2-4 CORRELATIVE WITH THE STRATIGRAPHIC TOPS OF INDIVIDUAL SAND BODIES, ALONG WITH THE OBSERVANCE OF INCREASED AMOUNTS OF HYDROCARBONS THROUGH THOSE INTERVALS. SINCE THIS DID NOT OCCUR AT THE STRATIGRAPHIC TOPS OF EVERY SAND IN THE SEQUENCE, I INCLUDE IT AS A NEGATIVE ARGUMENT WHEN CONSIDERING DRILLRATE CHANGES AS AN INFLUENCE OF OIL AMOUNTS IN THE SAMPLE, OR THE INTERPRETATION.
ALTHOUGH THE DITCH GAS CURVE WAS GENERALLY INACTIVE, SEVERAL SMALL KICKS WERE RECORDED WHICH INCLUDED SLIGHT INCREASES OF THE PETROLEUM VAPOR CURVE(SEE 4219,4614). THESE CORRESPOND WELL WITH CHANGES IN CHROMATOGRAPH READINGS, AND SINCE BOTH INSTRUMENTS RESPONDED TO THE CHANGE THE PLAUSABILITY OF GAS FRACTIONS HEAVIER THAN C1 BEING PRESENT IS STRENGTHENED.

JOHN E. MINER
13 AUGUST 1976
TENDOAN, IDAHO

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