analex
A GEOSCIENCE EXTENSION OF XCO

Unit
Copy

LBR
303/893-8138
DENVER, COLORADO

COMPANY DIAMOND SHAMROCK
Well Name WATZEK # 22-19
Location—Sec 19 Twp 6 N Rge 6 W CLATSOP Co, OREGON St
Elevation GL 636' KB 645' Spud 2/6/83 Finish
Total Depth Interval Logged
Pump Stroke-Length-Pump #1 7" Pump #2
Pump Liner-Diameter-Pump #1 6" Pump #2

LOGGING GEOLOGISTS
LARRY BAILEY
LARRY B. RANDALL

COMPANY AND RIG PERSONNEL
Company Geologist RICHARD E. WRIGHT
Company Foreman CHUCK WILSON
Drilling Company BRINKERHOFF SIGNAL # 20
Tool Pusher DALE LAEGER
Type of Mud LOW SOLIDS/NON-DISPERSED.

SERVICES PERFORMED TWO GEOLOGIST CONTINUOUS SAMPLING FID THA AND FID GAS CHROMATOGRAPH.

HOLE SIZE	DEPTH
13⅜"	sof- 1030'
8 3/4"	1030- TD.

CASING RECORD

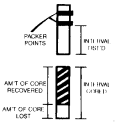
Depth	Size	Date
1028'	9 5/8	2/9/83

SYMBOLS

▨	ANHYDRITE	B	BENTONITIC
▱	CALCITE	⊥	CALCAREOUS
△△△	CHERT	▬	CARBONACEOUS
∘∘∘	CONGLOMERATE	?	CAVINGS
■	COAL	∠	DOLOMITIC
▨	DOLOMITE	f	FOSSILS
▦	GYPSUM	~	GLAUCONITIC
▦	LIMESTONE	☒	NO SAMPLES
TT	MARLSTONE	I	OOLITES
P	PYRITE	^	SILICEOUS
+++	SALT	?	VERY POOR SAMPLES
░	SANDSTONE	☐	STRINGERS
▤	SHALE	☐	
▤	SILTSTONE	☐	

ABBREVIATIONS

CG—Connection Gas
CO—Circulate Out
DEV—Survey
DST—Drill Stem Test
LAG—8 oz. Carbide
LAT—Logged After Trip
NB—New Bit
NCB—New Core Bit
PP—Pump Pressure
RPM—Revolutions/Minute
SPM—Strokes/Minute
TG—Trip Gas
WOB—Weight On Bit



Rate of Penetration min/ft ☒ ft/hr ☐ △ DPU	DST INTERVAL DEPTH INTERVAL CORED	Graphic Lithology	Lithology Descriptions, Remarks and Observations	Continuous Mud Gas (Attenuation scale is X100) 1% by vol. C1 in air = 100 units 10 UNITS 100 UNITS 1000 UNITS .1% 1% 10% —X—X—X——Cuttings Gas——X—X—X—	SHOW	Gas Chromatograph (Attenuation scale is 100X) (.1%) 10u (1%) 100u (10%) 1000u C1—Methane C2—Ethane C3—Propane IC4—Isobutane nC4—Normal Butane

TOTAL HYDROCARBON ANALYZER (THA) AND GAS CHROMATOGRAPH (GC) ARE CALIBRATED SIMULTANEOUSLY WITH 15.93% METHANE EQUIVALENCE (ME) IN AIR ; THE TEST GASES ARE COMPOSED OF 1 (ONE) MOLECULAR PERCENT C1, C2, C3, iC4 AND nC4.

COMMENCED LOGGING @ 1030' 2/13/83; 11:00pm IN THE PITTSBURG BLUFF FM.

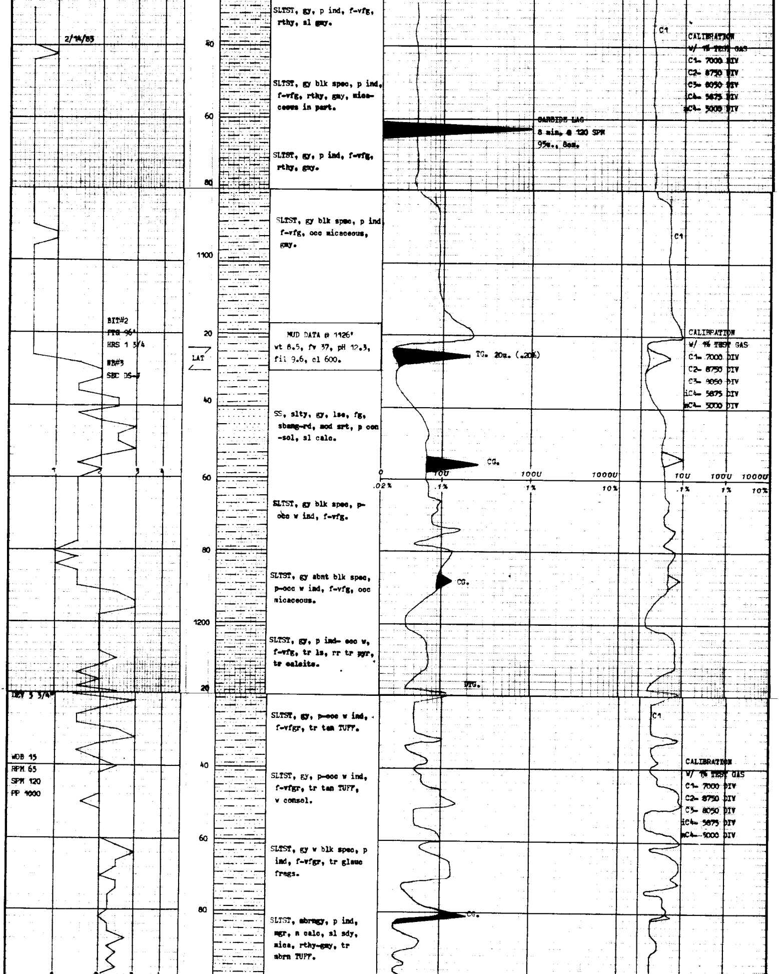
BIT#2
HUGHES #2
WOB 15
RPM 65
SPM 120
PP 1000

1 2 3 4

1020

0 10U 100U 1000U
.02% .1% 1% 10%

10U 100U 1000U
.1% 1% 10%



SLTST, gy, p ind, f-vfg, rthy, sl gmy.

SLTST, gy blk spec, p ind, f-vfg, rthy, gmy, micaceous in part.

SLTST, gy, p ind, f-vfg, rthy, gmy.

SLTST, gy blk spec, p ind, f-vfg, occ micaceous, gmy.

MUD DATA @ 1126'
wt 8.5, fv 37, pH 12.3, fil 9.6, cl 600.

SS, slty, gy, lse, fg, sbang-rd, mod srt, p consol, sl calc.

SLTST, gy blk spec, p-occ w ind, f-vfg.

SLTST, gy abnt blk spec, p-occ w ind, f-vfg, occ micaceous.

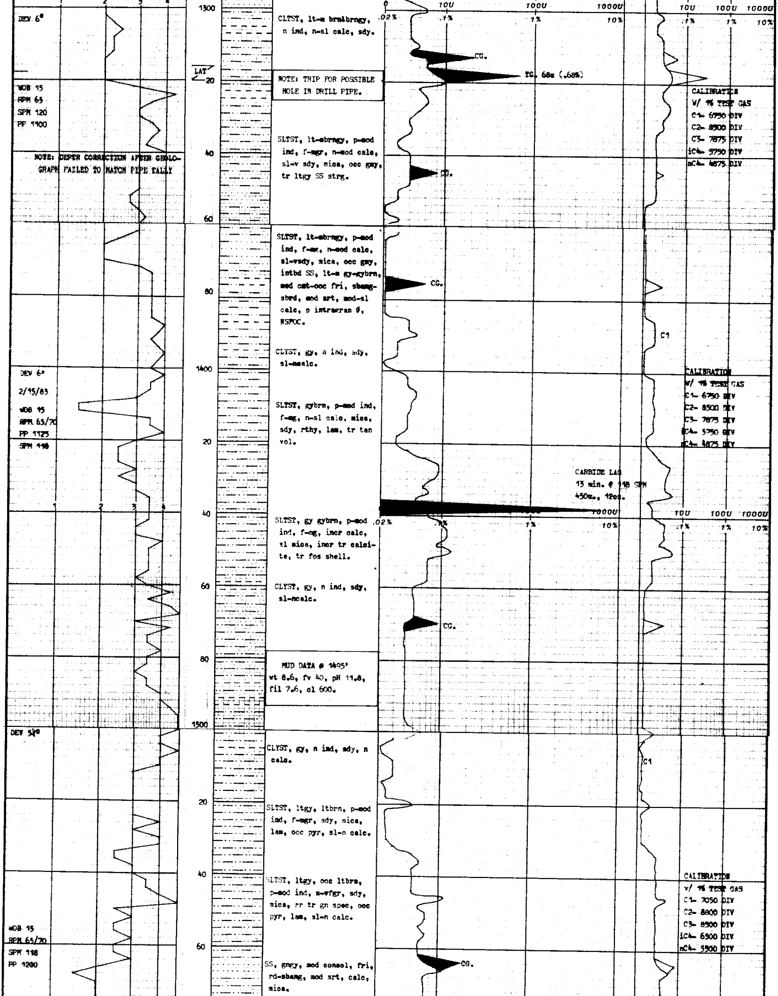
SLTST, gy, p ind- occ w, f-vfg, tr ls, rr tr pyr, tr calcite.

SLTST, gy, p-occ w ind, f-vfgr, tr tan TUFF.

SLTST, gy, p-occ w ind, f-vfgr, tr tan TUFF, w consol.

SLTST, gy w blk spec, p ind, f-vfgr, tr glauc frags.

SLTST, sbrngy, p ind, mgr, n calc, sl sdy, mica, rthy-gmy, tr sbrn TUFF.



DEV 6°

CLTST, lt-m brn&brngy, n ind, n-sl calc, sdy.

NOTE: TRIP FOR POSSIBLE HOLE IN DRILL PIPE.

WOB 15
RPM 65
SPM 120
PP 1100

CALIBRATION
W/ 1% TEST GAS
C1- 6750 DIV
C2- 8500 DIV
C3- 7875 DIV
iC4- 5750 DIV
nC4- 4875 DIV

SLTST, lt-mbrngy, p-mod ind, f-mgr, n-mod calc, sl-v sdy, mica, occ gmy, tr ltgy SS strg.

NOTE: DEPTH CORRECTION AFTER GEOLOGRAPH FAILED TO MATCH PIPE TALLY

SLTST, lt-mbrngy, p-mod ind, f-mgr, n-mod calc, sl-vsdy, mica, occ gmy, intbd SS, lt-m gy-gybrn, mod cmt-occ fri, sbang-sbrd, mod srt, mod-sl calc, p intrgran ø, NSFOC.

CLYST, gy, n ind, sdy, sl-ncalc.

DEV 6°
2/15/83
WOB 15
RPM 65/70
PP 1125
SPM 118

CALIBRATION
W/ 1% TEST GAS
C1- 6750 DIV
C2- 8500 DIV
C3- 7875 DIV
iC4- 5750 DIV
nC4- 4875 DIV

SLTST, gybrn, p-mod ind, f-mg, n-sl calc, mica, sdy, rthy, lam, tr tan vol.

CARBIDE LAG
13 min. @ 118 SPM
450u., 12oz.

SLTST, gy gybrn, p-mod ind, f-mg, incr calc, sl mica, incr tr calcite, tr fos shell.

CLYST, gy, n ind, sdy, sl-ncalc.

MUD DATA @ 1495'
wt 8.6, fv 40, pH 11.8, fil 7.6, cl 600.

DEV 5½°

CLYST, gy, n ind, sdy, n calc.

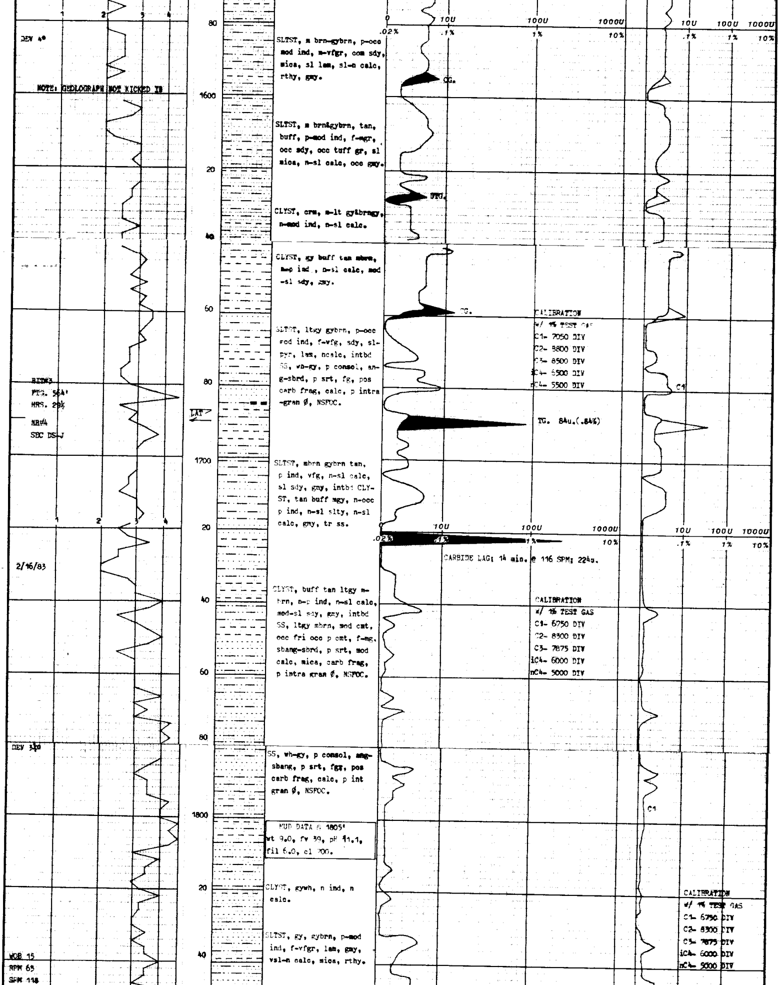
SLTST, ltgy, ltbrn, p-mod ind, f-mgr, sdy, mica, lam, occ pyr, sl-n calc.

SLTST, ltgy, occ ltbrn, p-mod ind, m-vfgr, sdy, mica, rr tr gn spec, occ pyr, lam, sl-n calc.

CALIBRATION
w/ 1% TEST GAS
C1- 7050 DIV
C2- 8800 DIV
C3- 8500 DIV
iC4- 6500 DIV
nC4- 5500 DIV

WOB 15
RPM 65/70
SPM 118
PP 1200

SS, gngy, mod consol, fri, rd-sbang, mod srt, calc, mica.



DEV 4°

NOTE: GEOLOGRAPH NOT KICKED IN

SLTST, m brn-gybrn, p-occ mod ind, m-vfgr, com sdy, mica, sl lam, sl-n calc, rthy, gmy.

SLTST, m brn&gybrn, tan, buff, p-mod ind, f-mgr, occ sdy, occ tuff gr, sl mica, n-sl calc, occ gmy.

CLYST, crm, m-lt gy&brngy, n-mod ind, n-sl calc.

CLYST, gy buff tan mbrn, m-p ind, n-sl calc, mod-sl sdy, gmy.

SLTST, ltgy gybrn, p-occ mod ind, f-vfg, sdy, sl-pyr, lam, ncalc, intbd SS, wh-gy, p consol, ang-sbrd, p srt, fg, pos carb frag, calc, p intra-gran Ø, NSFOC.

CALIBRATION
w/ 1% TEST GAS
C1- 7050 DIV
C2- 8800 DIV
C3- 8500 DIV
iC4- 6500 DIV
nC4- 5500 DIV

BIT#3
FTG. 564'
HRS. 29½

NB#4
SEC DS-J

SLTST, mbrn gybrn tan, p ind, vfg, n-sl calc, sl sdy, gmy, intbd CLYST, tan buff mgy, n-occ p ind, n-sl slty, n-sl calc, gmy, tr ss.

2/16/83

CARBIDE LAG: 14 min. @ 116 SPM: 224s.

CLYST, buff tan ltgy m-brn, n-p ind, n-sl calc, mod-sl sdy, gmy, intbd SS, ltgy mbrn, mod cmt, occ fri occ p cmt, f-mg, sbang-sbrd, p srt, mod calc, mica, carb frag, p intra gran Ø, NSFOC.

CALIBRATION
w/ 1% TEST GAS
C1- 6750 DIV
C2- 8300 DIV
C3- 7875 DIV
iC4- 6000 DIV
nC4- 5000 DIV

DEV 3½°

SS, wh-gy, p consol, ang-sbang, p srt, fgr, pos carb frag, calc, p int gran Ø, NSFOC.

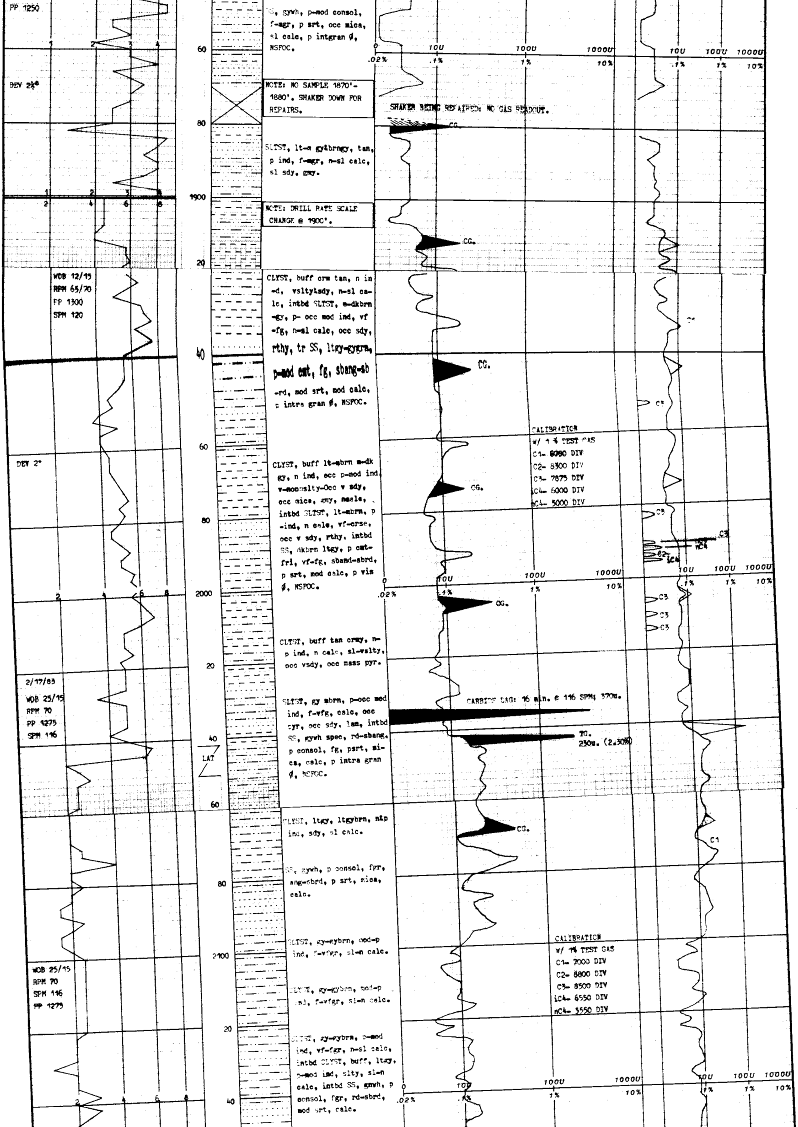
MUD DATA @ 1805'
wt 9.0, fv 39, pH 11.1,
fil 6.0, cl 700.

CLYST, gywh, n ind, n calc.

SLTST, gy, gybrn, p-mod ind, f-vfgr, lam, gmy, vsl-n calc, mica, rthy.

CALIBRATION
w/ 1% TEST GAS
C1- 6750 DIV
C2- 8300 DIV
C3- 7875 DIV
iC4- 6000 DIV
nC4- 5000 DIV

WOB 15
RPM 65
SPM 118



SS, gywh, p-mod consol, f-mgr, p srt, occ mica, sl calc, p intgran ∅, NSFOC.

NOTE: NO SAMPLE 1870'-1880'. SHAKER DOWN FOR REPAIRS.

SLTST, lt-m gy&brngy, tan, p ind, f-mgr, n-sl calc, sl sdy, gmy.

NOTE: DRILL RATE SCALE CHANGE @ 1900'.

CLYST, buff crm tan, n ind, vslty&sdy, n-sl calc, intbd SLTST, m-dkbrn-gy, p- occ mod ind, vf-fg, n-sl calc, occ sdy, rthy, tr SS, ltgy-gygrn, p-mod cmt, fg, sbang-sb-rd, mod srt, mod calc, p intra gran ∅, NSFOC.

CALIBRATION
W/ 1 % TEST GAS
C1- 8090 DIV
C2- 8300 DIV
C3- 7875 DIV
iC4- 6000 DIV
nC4- 5000 DIV

CLYST, buff lt-mbrn m-dk gy, n ind, occ p-mod ind, v-mod sltyocc v sdy, occ mica, gmy, mcalc, intbd SLTST, lt-mbrn, p-ind, n calc, vf-crse, occ v sdy, rthy, intbd SS, dkbrn ltgy, p cmt-fri, vf-fg, sbang-sbrd, p srt, mod calc, p vis ∅, NSFOC.

CLYST, buff tan crmy, n-p ind, n calc, sl-vslty, occ vsdy, occ mass pyr.

SLTST, gy mbrn, p-occ mod ind, f-vfg, calc, occ pyr, occ sdy, lam, intbd SS, gywh spec, rd-sbang, p consol, fg, psrt, mica, calc, p intra gran ∅, NSFOC.

CLYST, ltgy, ltgybrn, n&p ind, sdy, sl calc.

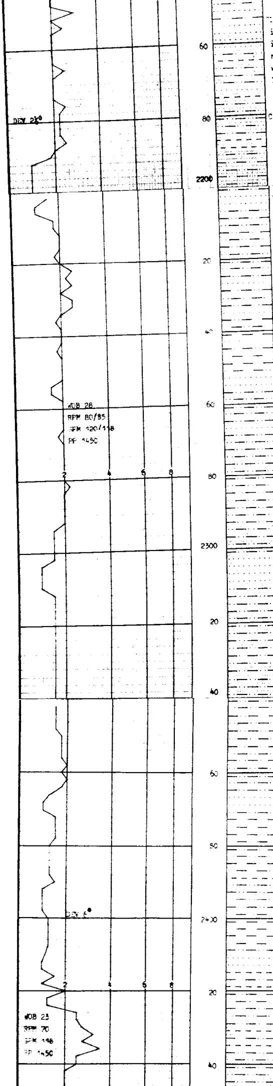
SS, gywh, p consol, fgr, ang-sbrd, p srt, mica, calc.

SLTST, gy-gybrn, mod-p ind, f-vfgr, sl-n calc.

SLTST, gy-gybrn, mod-p ind, f-vfgr, sl-n calc.

SLTST, gy-gybrn, p-mod ind, vf-fgr, n-sl calc, intbd CLYST, buff, ltgy, p-mod ind, slty, sl-n calc, intbd SS, gnwh, p consol, fgr, rd-sbrd, mod srt, calc.

CALIBRATION
W/ 1% TEST GAS
C1- 7000 DIV
C2- 8800 DIV
C3- 8500 DIV
iC4- 6550 DIV
nC4- 5550 DIV



SLTST, gy-gybrn, p-mod ind, vf-fgr, n-sl calc, intbd CLYST, buff, ltgy, n-p ind, slty, sl-n calc, w SS strg, occ TUFF, ltbrn, w consol, sdy.

CLYST, buff, lt-mbrn, n-p ind, n-sl calc, mod-sl sdy, occ sl lam, gmy, tr rthy.

SS, mbrn, tr lt-mgy, p consol-fri, vf-cgr, ang-sbrd, p-tr mod srt, n-tr mod calc, p intgran ∅, NSFOC.

SLTST, mbrn, gy, p-mod ind, n-sl calc, f-mgr, tuff, ark, rthy.

SS, m-lt gybrn, p-mod consol, occ fri, vf-fgr, ang-sbrd, p-mod srt, ark, p intgran ∅, NSFOC.

SLTST, mbrn, p-mod ind, occ fri, n-sl calc, ark, com v sdy.

SLTST, m-dkbrn, p-sl ind, occ fri, n-sl calc, ark, occ tuff, sl-v sdy, arg.

SS, mbrn, lt gy-grgy, p-mod consol, occ fri, mod-n calc, vf-mgr, ang-sbrd, p srt, ark, mica, slty, p intgran ∅, NSFOC.

SLTST, m-dkbrn, p-sl ind, occ fri, n-sl calc, ark, occ tuff, sl-v sdy, arg.

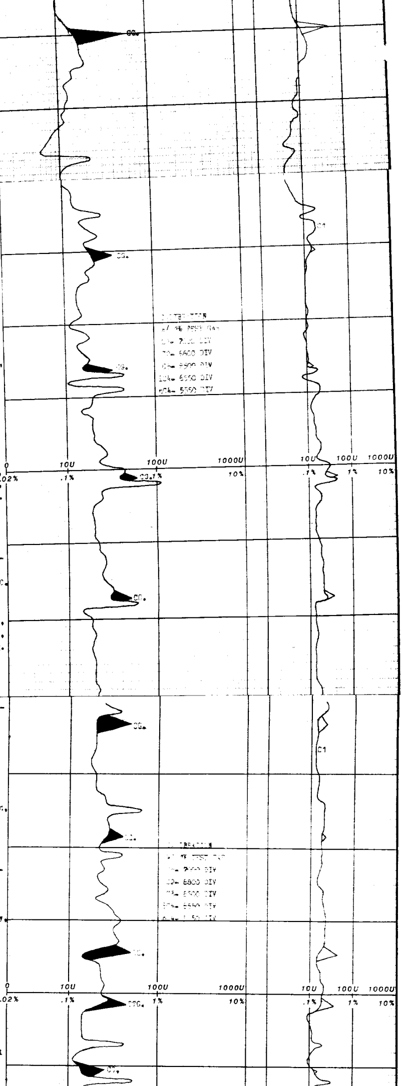
SLTST, m-dk brn&gybrn, p-tr mod ind, n-sl calc, fgr, sl-mod sdy, mica, sl lam.

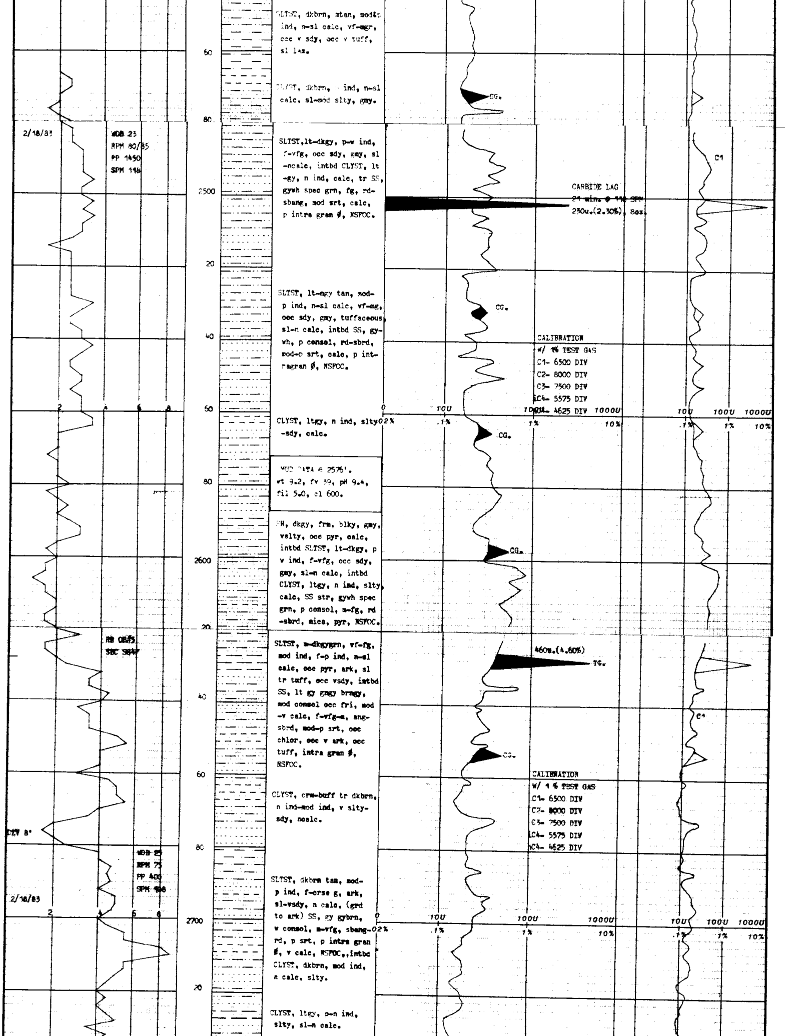
SS, mbrn, lt gy-mgy, p-mod ind, occ fri, mod-n calc, vf-mgr, ang-sbrd, p srt, ark, mica, slty, p intgran ∅, NSFOC.

SLTST, dkbrn, occ tan, p-mod ind, sl-n calc, vf-fgr, occ sdy, mica, intbd dkbrn&buff CLYST, p ind, sl calc, mod slty, gmy.

SS, dkorngy, ltgy, p-mod consol, occ fri, mod-n calc, vf-mgr, ang-sbrd, p srt, ark, mica, slty, p intgran ∅, NSFOC.

CLYST, dkbrn, p ind, n-sl calc, sl-mod slty, gmy.





SLTST, dkbrn, mtan, mod&p ind, n-sl calc, vf-mgr, occ v sdy, occ v tuff, sl lam.

CLYST, dkbrn, n ind, n-sl calc, sl-mod slty, gmy.

SLTST, lt-dkgy, p-w ind, f-vfg, occ sdy, gmy, sl-ncalc, intbd CLYST, lt-gy, n ind, calc, tr SS, gywh spec grn, fg, rd-sbang, mod srt, calc, p intra gran ∅, NSFOC.

SLTST, lt-mgy tan, mod-p ind, n-sl calc, vf-mg, occ sdy, gmy, tuffaceous, sl-n calc, intbd SS, gy-wh, p consol, rd-sbrd, mod-p srt, calc, p intragran ∅, NSFOC.

CALIBRATION
W/ 1% TEST GAS
C1- 6500 DIV
C2- 8000 DIV
C3- 7500 DIV
iC4- 5575 DIV
nC4- 4625 DIV

CLYST, ltgy, n ind, slty-sdy, calc.

MUD DATA @ 2575'.
wt 9.2, fv 39, pH 9.4,
fil 5.0, cl 600.

SH, dkgy, frm, blky, gmy, vslty, occ pyr, calc, intbd SLTST, lt-dkgy, p-w ind, f-vfg, occ sdy, gmy, sl-n calc, intbd CLYST, ltgy, n ind, slty, calc, SS str, gywh spec grn, p consol, m-fg, rd-sbrd, mica, pyr, NSFOC.

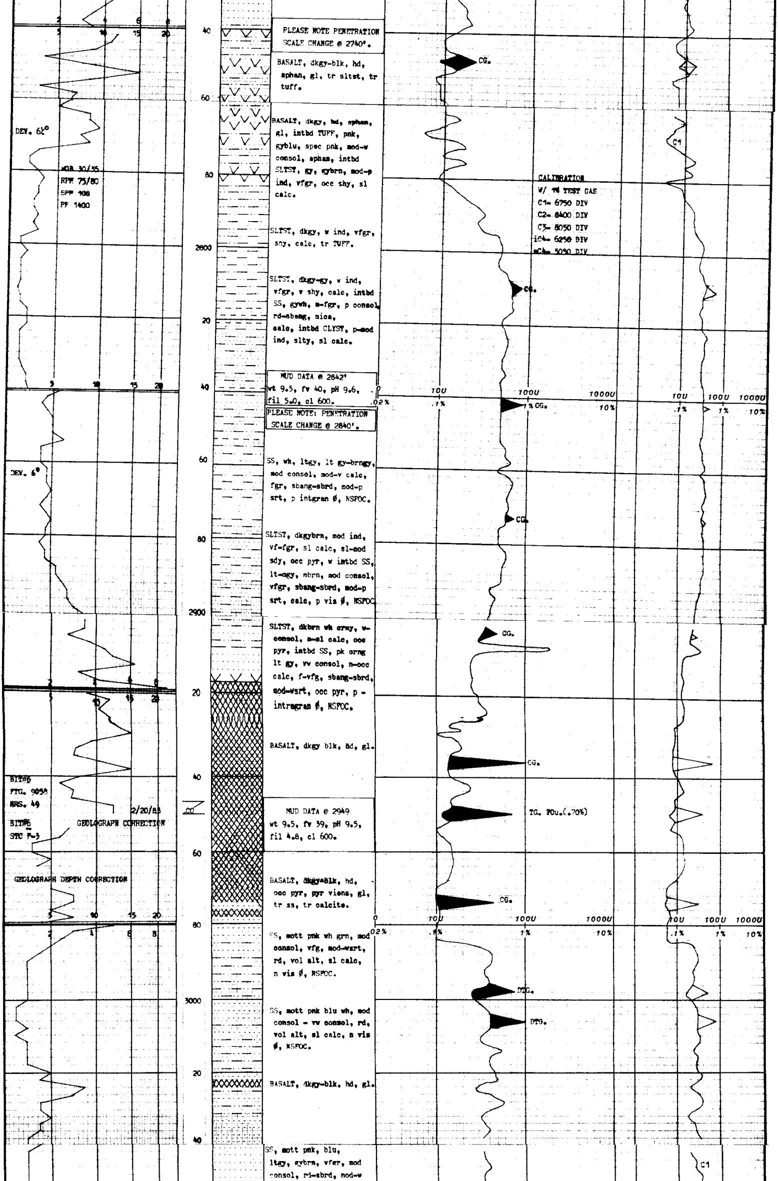
SLTST, m-dkgygrn, vf-fg, mod ind, f-p ind, n-sl calc, occ pyr, ark, sl tr tuff, occ vsdy, intbd SS, lt gy gngy brngy, mod consol occ fri, mod-v calc, f-vfg-m, ang-sbrd, mod-p srt, occ chlor, occ v ark, occ tuff, intra gran ∅, NSFOC.

CALIBRATION
W/ 1 % TEST GAS
C1- 6500 DIV
C2- 8000 DIV
C3- 7500 DIV
iC4- 5575 DIV
nC4- 4625 DIV

CLYST, crm-buff tr dkbrn, n ind-mod ind, v slty-sdy, ncalc.

SLTST, dkbrn tan, mod-p ind, f-crse g, ark, sl-vsdy, n calc, (grd to ark) SS, gy gybrn, v consol, m-vfg, sbang-rd, p srt, p intra gran ∅, v calc, NSFOC., intbd CLYST, dkbrn, mod ind, n calc, slty.

CLYST, ltgy, p-n ind, slty, sl-n calc.



PLEASE NOTE PENETRATION SCALE CHANGE @ 2740'.

BASALT, dkgy-blk, hd, aphan, gl, tr sltst, tr tuff.

BASALT, dkgy, hd, aphan, gl, intbd TUFF, pnk, gyblu, spec pnk, mod-w consol, aphan, intbd SLTST, gy, gybrn, mod-p ind, vfgr, occ shy, sl calc.

SLTST, dkgy, w ind, vfgr, shy, calc, tr TUFF.

SLTST, dkgy-gy, w ind, vfgr, v shy, calc, intbd SS, gywh, m-fgr, p consol, rd-sbang, mica, calc, intbd CLYST, p-mod ind, slty, sl calc.

MUD DATA @ 2842'
wt 9.5, fv 40, pH 9.6, fil 5.0, cl 600.

PLEASE NOTE: PENETRATION SCALE CHANGE @ 2840'.

SS, wh, ltgy, lt gy-brngy, mod consol, mod-v calc, fgr, sbang-sbrd, mod-p srt, p intgran ø, NSFOC.

SLTST, dkgybrn, mod ind, vf-fgr, sl calc, sl-mod sdy, occ pyr, w intbd SS, lt-mgy, mbrn, mod consol, vfgr, sbang-sbrd, mod-p srt, calc, p vis ø, NSFOC.

SLTST, dkbrn wh crmy, w-consol, n-sl calc, occ pyr, intbd SS, pk orng lt gy, vw consol, n-occ calc, f-vfg, sbang-sbrd, mod-wsrt, occ pyr, p - intragran ø, NSFOC.

BASALT, dkgy blk, hd, gl.

MUD DATA @ 2949
wt 9.5, fv 39, pH 9.5, fil 4.8, cl 600.

BASALT, dkgy-blk, hd, occ pyr, pyr viens, gl, tr ss, tr calcite.

SS, mott pnk wh grn, mod consol, vfg, mod-wsrt, rd, vol alt, sl calc, n vis ø, NSFOC.

SS, mott pnk blu wh, mod consol - vw consol, rd, vol alt, sl calc, n vis ø, NSFOC.

BASALT, dkgy-blk, hd, gl.

SS, mott pnk, blu, ltgy, gybrn, vfgr, mod consol, rd-sbrd, mod-w

DEV. 6½°

WOB 30/35
RPM 75/80
SPM 108
PP 1400

CALIBRATION
W/ ~~%~~ TEST GAS
C1- 6750 DIV
C2- 8400 DIV
C3- 8050 DIV
iC4- 6250 DIV
nC4- 5050 DIV

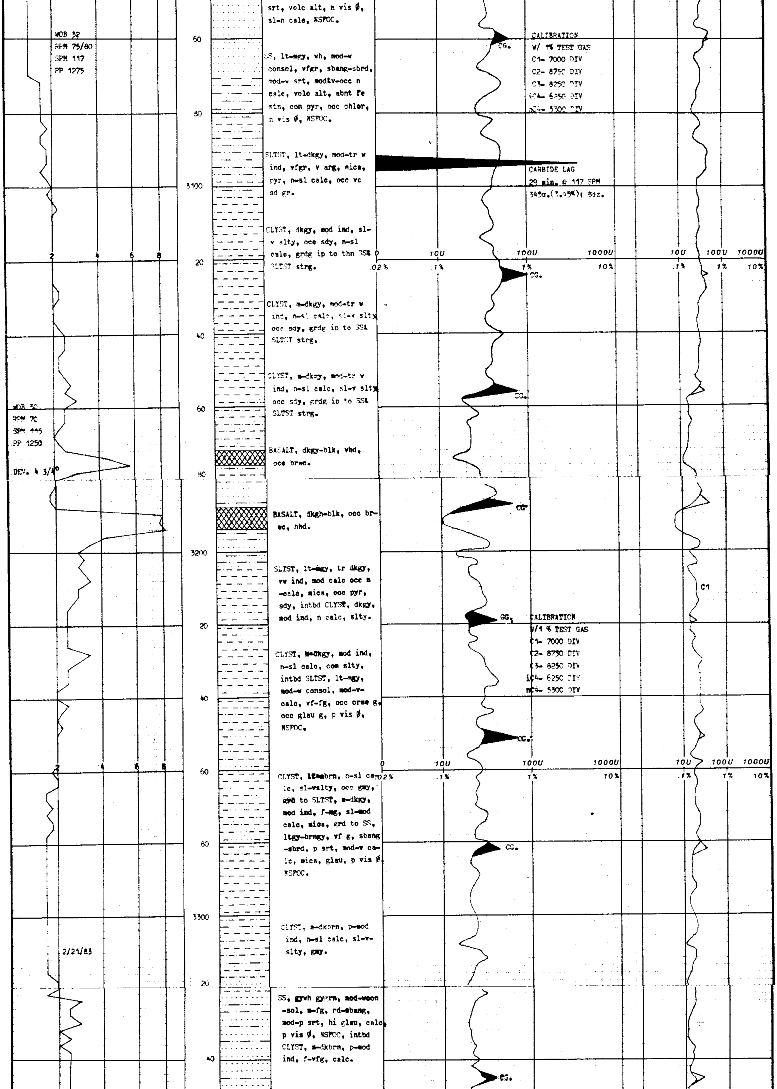
DEV. 6°

BIT#5
FTG. 9058
HRS. 49

BIT#6
STC F-3

GEOLOGRAPH CORRECTION

GEOLOGRAPH DEPTH CORRECTION



WOB 32
RPM 75/80
SPM 117
PP 1275

srt, volc alt, n vis Ø, sl-n calc, NSFOC.

SS, lt-mgy, wh, mod-w consol, vfgr, sbang-sbrd, mod-w srt, mod&v-occ n calc, volc alt, abnt Fe stn, com pyr, occ chlor, n vis Ø, NSFOC.

CALIBRATION
W/ 1% TEST GAS
C1- 7000 DIV
C2- 8750 DIV
C3- 8250 DIV
iC4- 6250 DIV
nC4- 5300 DIV

SLTST, lt-dkgy, mod-tr w ind, vfgr, v arg, mica, pyr, n-sl calc, occ vc sd gr.

CARBIDE LAG
29 min. @ 117 SPM
345u.(3.45%); 8oz.

CLYST, dkgy, mod ind, sl-v slty, occ sdy, n-sl calc, grdg ip to thn SS& SLTST strg.

CLYST, m-dkgy, mod-tr w ind, n-sl calc, sl-v slty, occ sdy, grdg ip to SS& SLTST strg.

CLYST, m-dkgy, mod-tr w ind, n-sl calc, sl-v slty, occ sdy, grdg ip to SS& SLTST strg.

WOB 30
RPM 70
SPM 115
PP 1250

BASALT, dkgy-blk, vhd, occ brec.

DEV. 4 3/4°

BASALT, dkgh-blk, occ brec, hhd.

SLTST, lt-mgy, tr dkgy, vw ind, mod calc occ n-calc, mica, occ pyr, sdy, intbd CLYST, dkgy, mod ind, n calc, slty.

CALIBRATION
W/1 % TEST GAS
C1- 7000 DIV
C2- 8750 DIV
C3- 8250 DIV
iC4- 6250 DIV
nC4- 5300 DIV

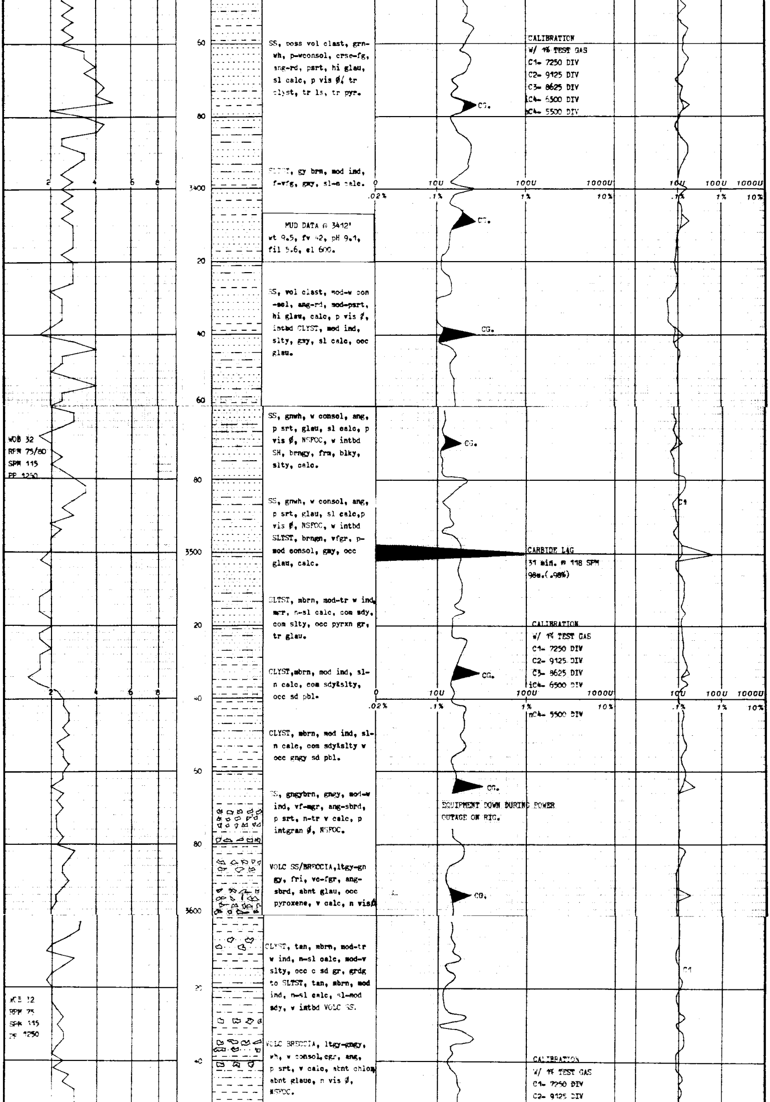
CLYST, m-dkgy, mod ind, n-sl calc, com slty, intbd SLTST, lt-mgy, mod-w consol, mod-v-calc, vf-fg, occ crse g, occ glau g, p vis Ø, NSFOC.

CLYST, lt-mbrn, n-sl calc, sl-vslty, occ gmy, grd to SLTST, m-dkgy, mod ind, f-mg, sl-mod calc, mica, grd to SS, ltgy-brngy, vf g, sbang-sbrd, p srt, mod-v calc, mica, glau, p vis Ø, NSFOC.

CLYST, m-dkbrn, p-mod ind, n-sl calc, sl-v-slty, gmy.

2/21/83

SS, gywh gygrn, mod-wconsol, m-fg, rd-sbang, mod-p srt, hi glau, calc, p vis Ø, NSFOC, intbd CLYST, m-dkbrn, p-mod ind, f-vfg, calc.



SS, poss vol clast, grn-wh, p-wconsol, crse-fg, ang-rd, psrt, hi glau, sl calc, p vis ø/ tr clyst, tr ls, tr pyr.

CALIBRATION
W/ 1% TEST GAS
C1- 7250 DIV
C2- 9125 DIV
C3- 8625 DIV
iC4- 6500 DIV
nC4- 5500 DIV

SLTST, gy brn, mod ind, f-vfg, gmy, sl-n calc.

MUD DATA @ 3412'
wt 9.5, fv 42, pH 9.1, fil 5.6, el 600.

SS, vol clast, mod-w consol, ang-rd, mod-psrt, hi glau, calc, p vis ø, intbd CLYST, mod ind, slty, gmy, sl calc, occ glau.

WOB 32
RPM 75/80
SPM 115
PP 1250

SS, gnwh, w consol, ang, p srt, glau, sl calc, p vis ø, NSFOC, w intbd SH, brngy, frm, blky, slty, calc.

SS, gnwh, w consol, ang, p srt, glau, sl calc, p vis ø, NSFOC, w intbd SLTST, brngn, vfgr, p-mod consol, gmy, occ glau, calc.

CARBIDE LAG
31 min. @ 118 SPM
98u.(.98%)

SLTST, mbrn, mod-tr w ind, mcr, n-sl calc, com sdy, com slty, occ pyrxn gr, tr glau.

CALIBRATION
W/ 1% TEST GAS
C1- 7250 DIV
C2- 9125 DIV
C3- 8625 DIV
iC4- 6500 DIV
nC4- 5500 DIV

CLYST, mbrn, mod ind, sl-n calc, com sdy&slty, occ sd pbl.

CLYST, mbrn, mod ind, sl-n calc, com sdy&slty w occ gngy sd pbl.

SS, gngybrn, gngy, mod-w ind, vf-mgr, ang-sbrd, p srt, n-tr v calc, p intgran ø, NSFOC.

EQUIPMENT DOWN DURING POWER OUTAGE ON RIG.

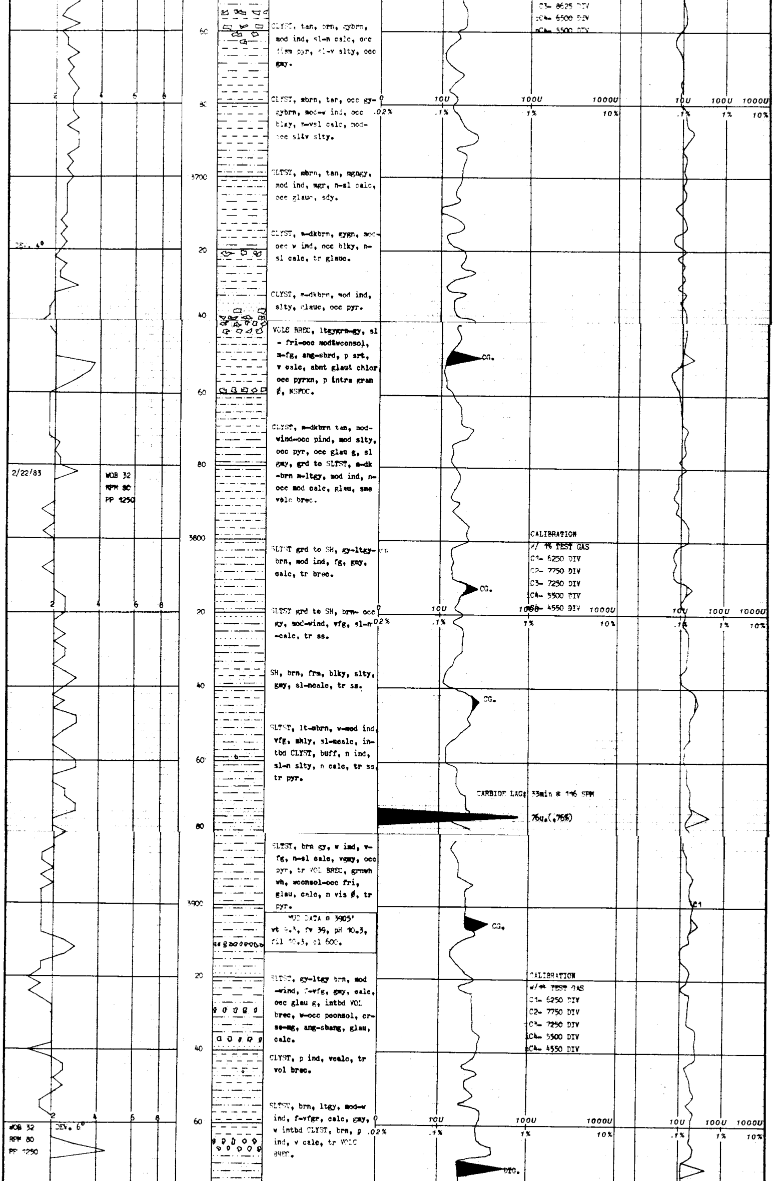
VOLC SS/BRECCIA, ltgy-gngy, fri, vc-fgr, ang-sbrd, abnt glau, occ pyroxene, v calc, n visø

CLYST, tan, mbrn, mod-tr w ind, n-sl calc, mod-v slty, occ c sd gr, grdg to SLTST, tan, mbrn, mod ind, n-sl calc, sl-mod sdy, v intbd VOLC SS.

WOB 32
RPM 75
SPM 115
PP 1250

VOLC BRECCIA, ltgy-gngy, wh, w consol, cgr, ang, p srt, v calc, abnt chlor, abnt glauc, n vis ø, NSFOC.

CALIBRATION
W/ 1% TEST GAS
C1- 7250 DIV
C2- 9125 DIV



C3- 8625 DIV
iC4- 6500 DIV
nC4- 5500 DIV

CLYST, tan, brn, gybrn, mod ind, sl-n calc, occ dism pyr, sl-v slty, occ gmy.

CLYST, mbrn, tan, occ gy-gybrn, mod-v ind, occ blky, n-vsl calc, mod-occ sl&v slty.

SLTST, mbrn, tan, mgngy, mod ind, mgr, n-sl calc, occ glauc, sdy.

DEV. 4°

CLYST, m-dkbrn, gygn, mod-occ v ind, occ blky, n-sl calc, tr glauc.

CLYST, m-dkbrn, mod ind, slty, glauc, occ pyr.

VOLC BREC, ltgygrn-gy, sl - fri-occ mod&wconsol, m-fg, ang-sbrd, p srt, v calc, abnt glau& chlor, occ pyrxn, p intra gran ø, NSFOC.

CLYST, m-dkbrn tan, mod-wind-occ pind, mod slty, occ pyr, occ glau g, sl gmy, grd to SLTST, m-dk-brn m-ltgy, mod ind, n-occ mod calc, glau, sme volc brec.

2/22/83

WOB 32
RPM 80
PP 1250

SLTST grd to SH, gy-ltgy-brn brn, mod ind, fg, gmy, calc, tr brec.

CALIBRATION
w/ 1% TEST GAS
C1- 6250 DIV
C2- 7750 DIV
C3- 7250 DIV
iC4- 5500 DIV
nC4- 4550 DIV

SLTST grd to SH, brn- occ gy, mod-wind, vfg, sl-n-calc, tr ss.

SH, brn, frm, blky, slty, gmy, sl-ncalc, tr ss.

SLTST, lt-mbrn, w-mod ind, vfg, shly, sl-ncalc, intbd CLYST, buff, n ind, sl-n slty, n calc, tr ss, tr pyr.

CARBIDE LAG: 33min @ 116 SPM

76u.(.76%)

SLTST, brn gy, w ind, v-fg, n-sl calc, vgmy, occ pyr, tr VOL BREC, grnwh wh, wconsol-occ fri, glau, calc, n vis ø, tr pyr.

MUD DATA @ 3905'
wt 9.3, fv 39, pH 10.3, fil 10.3, cl 600.

SLTST, gy-ltgy brn, mod-wind, f-vfg, gmy, calc, occ glau g, intbd VOL brec, w-occ poconsol, crse-mg, ang-sbang, glau, calc.

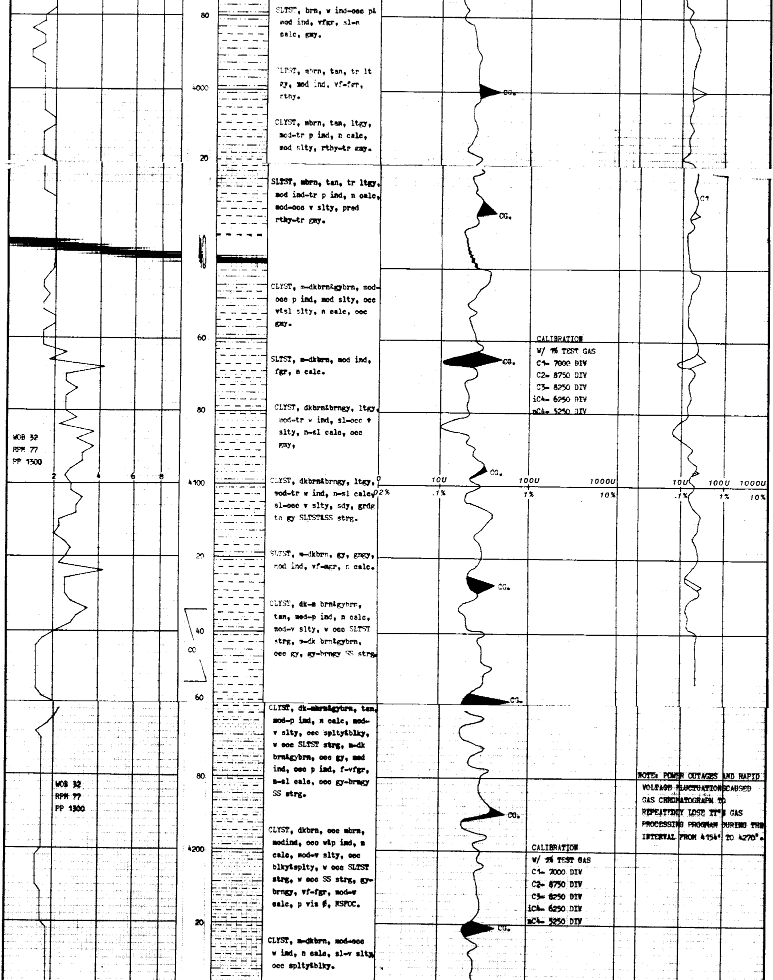
CALIBRATION
w/1% TEST GAS
C1- 6250 DIV
C2- 7750 DIV
C3- 7250 DIV
iC4- 5500 DIV
nC4- 4550 DIV

CLYST, p ind, vcalc, tr vol brec.

SLTST, brn, ltgy, mod-w ind, f-vfgr, calc, gmy, w intbd CLYST, brn, p ind, v calc, tr VOLC BREC.

WOB 32
RPM 80
PP 1290

DEV. 6°



SLTST, brn, w ind-occ p& mod ind, vfgr, sl-n calc, gmy.

SLTST, mbrn, tan, tr lt gy, mod ind, vf-fgr, rthy.

CLYST, mbrn, tan, ltgy, mod-tr p ind, n calc, mod slty, rthy-tr gmy.

SLTST, mbrn, tan, tr ltgy, mod ind-tr p ind, n calc, mod-occ v slty, pred rthy-tr gmy.

CLYST, m-dkbrn&gybrn, mod-occ p ind, mod slty, occ v&sl slty, n calc, occ gmy.

SLTST, m-dkbrn, mod ind, fgr, n calc.

CALIBRATION
W/ 1% TEST GAS
C1- 7000 DIV
C2- 8750 DIV
C3- 8250 DIV
iC4- 6250 DIV
nC4- 5250 DIV

CLYST, dkbrn&brngy, ltgy, mod-tr w ind, sl-occ v slty, n-sl calc, occ gmy,

CLYST, dkbrn&brngy, ltgy, mod-tr w ind, n-sl calc, sl-occ v slty, sdy, grdg to gy SLTST&SS strg.

SLTST, m-dkbrn, gy, gngy, mod ind, vf-mgr, n calc.

CLYST, dk-m brn&gybrn, tan, mod-p ind, n calc, mod-v slty, w occ SLTST strg, m-dk brn&gybrn, occ gy, gy-brngy SS strg.

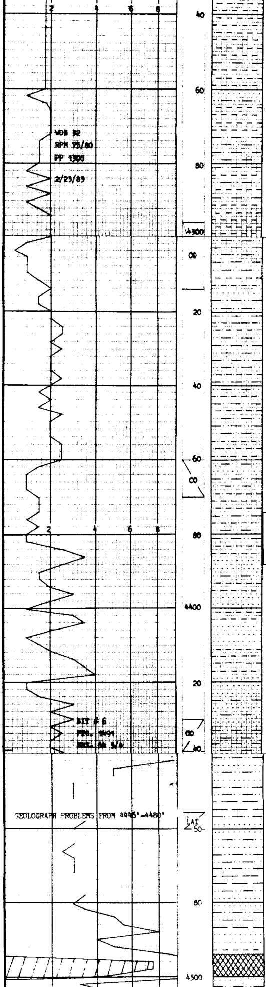
CLYST, dk-mbrn&gybrn, tan, mod-p ind, n calc, mod-v slty, occ splty&blky, w occ SLTST strg, m-dk brn&gybrn, occ gy, mod ind, occ p ind, f-vfgr, n-sl calc, occ gy-brngy SS strg.

NOTE: POWER OUTAGES AND RAPID VOLTAGE FLUCTUATIONS CAUSED GAS CHROMATOGRAPH TO REPEATEDLY LOSE IT'S GAS PROCESSING PROGRAM DURING THE INTERVAL FROM 4154' TO 4270'.

CLYST, dkbrn, occ mbrn, modind, occ w&p ind, n calc, mod-v slty, occ blky&splty, w occ SLTST strg, w occ SS strg, gy-brngy, vf-fgr, mod-v calc, p vis ø, NSFOC.

CALIBRATION
W/ 1% TEST GAS
C1- 7000 DIV
C2- 8750 DIV
C3- 8250 DIV
iC4- 6250 DIV
nC4- 5250 DIV

CLYST, m-dkbrn, mod-occ w ind, n calc, sl-v slty, occ splty&blky.



CLYST, m-dkbrn, mod-occ w ind, n calc, sl-v slty, occ splty&blky.

CLYST, dkbrn, mod-tr w ind, n calc, sl-v slty, occ sdy, occ blky&splty, tr SS & SLTST strg.

SLTST, mbrn, mod ind, f-vfgr, calc, gmy, w tr SS, gnwh-occ wh, mod-p consol, f-mgr, calc, f-vf pyr gr.

SLTST, mbrn, mod ind, f-vfgr, gmy, sl calc, w intbd CLYST, buff, p-n ind, slty, sl-n calc.

SLTST, mbrn, mod ind, f-vfgr, gmy, sl calc, w intbd CLYST, buff, p-n ind, slty, sl-n calc, w tr intbd SS, wh, p consol, fri, f-mgr, calc, n-p vis ∅, NSFOC.

SLTST, m-ltbrn, mod-p ind, f-vfgr, occ sdy, gmy, calc, w CLYST, buff, lt gy, p-n ind, slty, calc, tr pyr, tr volc SS.

MUD DATA @ 4372'
wt 9.4, fv 41, pH 11.1, fil 6.5, cl 700.

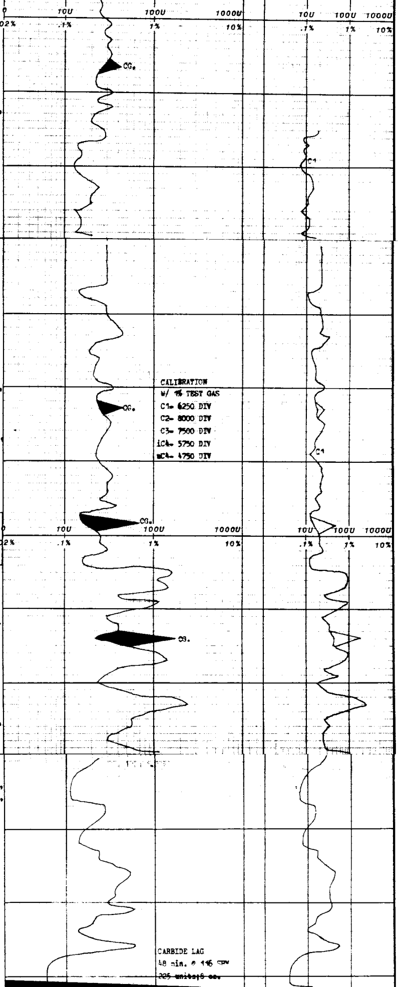
SS, wh spec gn, p consol, m-fgr, rd-sbrd, calc, mica, wk yel flor, NOC, w intbd CLYST, brngy, p-occ n ind, slty, calc.

SS, wh, p consol, mgr, rd-sbrd, calc, mica, glau, wk yel flor, NOC, w intbd SLTST, gybrn-brn, mod ind, vfgr, gmy, occ sdy, calc.

SLTST, brn-gy, mod ind, vfg, gmy, occ wxy, sl-n calc, intbd SH, gybrn, frm, blky, gmy, sl calc, intbd SS, wh, p consol, mg, rd-sbrd, mod srt, glau, calc, mod vis ∅, NSFOC, tr clyst, abnt pyr.

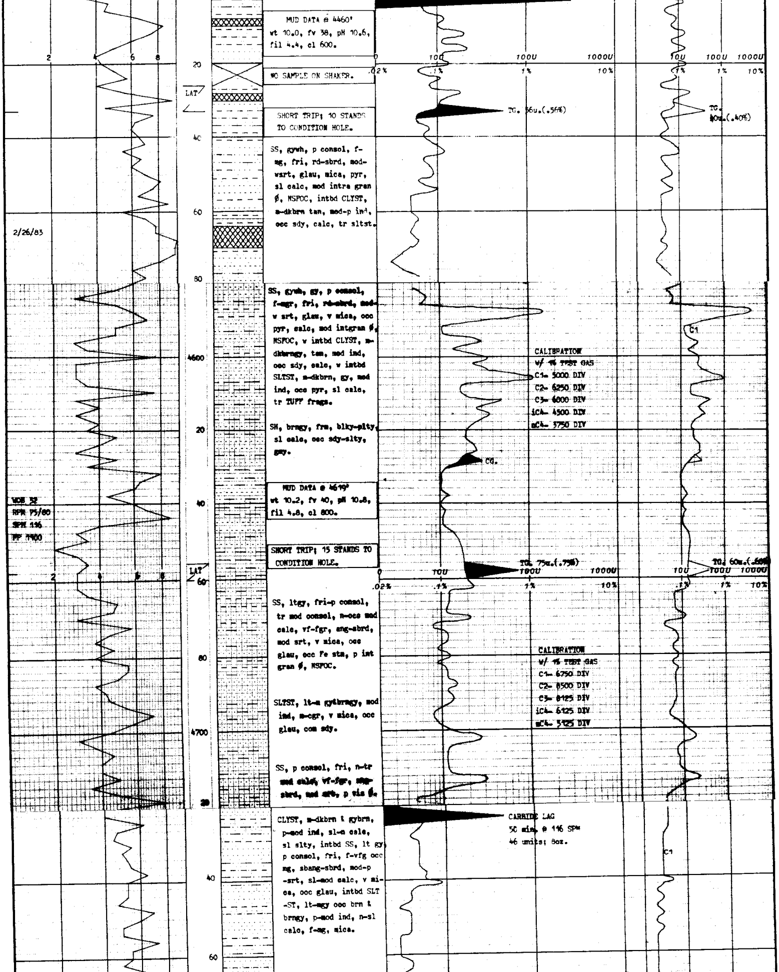
SS, wh, p consol, fri, rd-sbrd, glau, calc, p-vis ∅, NSFOC.

BASALT, blk, hd, aphan, gl.



CALIBRATION
W/ 1% TEST GAS
C1- 6250 DIV
C2- 8000 DIV
C3- 7500 DIV
iC4- 5750 DIV
nC4- 4750 DIV

CARBIDE LAG
48 min. @ 146 SPM
225 units@6 oz.



MUD DATA @ 4460'
wt 10.0, fv 38, pH 10.6, fil 4.4, cl 600.

NO SAMPLE ON SHAKER.

SHORT TRIP; 10 STANDS TO CONDITION HOLE.

SS, gywh, p consol, f-mg, fri, rd-sbrd, mod-wsrt, glau, mica, pyr, sl calc, mod intra gran ø, NSFOC, intbd CLYST, m-dkbrn tan, mod-p ind, occ sdy, calc, tr sltst.

SS, gywh, gy, p consol, f-mgr, fri, rd-sbrd, mod-w srt, glau, v mica, occ pyr, calc, mod intgran ø, NSFOC, v intbd CLYST, m-dkbrngy, tan, mod ind, occ sdy, calc, v intbd SLTST, m-dkbrn, gy, mod ind, occ pyr, sl calc, tr TUFF frags.

SH, brngy, frm, blky-plty, sl calc, occ sdy-slty, gmy.

CALIBRATION
W/ 1% TEST GAS
C1- 5000 DIV
C2- 6250 DIV
C3- 6000 DIV
iC4- 4500 DIV
nC4- 3750 DIV

MUD DATA @ 4619'
wt 10.2, fv 40, pH 10.8, fil 4.8, cl 800.

SHORT TRIP; 15 STANDS TO CONDITION HOLE.

SS, ltgy, fri-p consol, tr mod consol, n-occ mod calc, vf-fgr, ang-sbrd, mod srt, v mica, occ glau, occ Fe stn, p int gran ø, NSFOC.

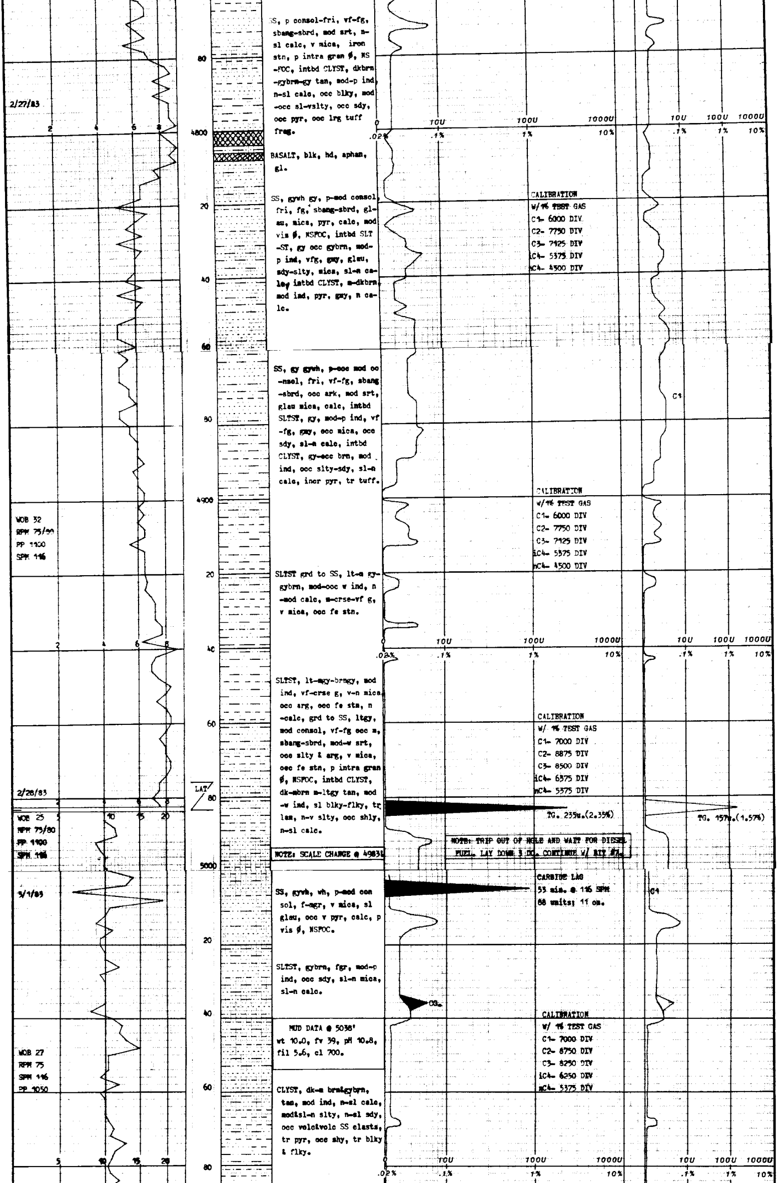
CALIBRATION
W/ 1% TEST GAS
C1- 6750 DIV
C2- 8500 DIV
C3- 8125 DIV
iC4- 6125 DIV
nC4- 5125 DIV

SLTST, lt-m gy&brngy, mod ind, m-cgr, v mica, occ glau, com sdy.

SS, p consol, fri, n-tr mod calc, vf-fgr, ang-sbrd, mod srt, p vis ø.

CLYST, m-dkbrn & gybrn, p-mod ind, sl-n calc, sl slty, intbd SS, lt gy, p consol, fri, f-vfg occ mg, sbang-sbrd, mod-p -srt, sl-mod calc, v mica, occ glau, intbd SLT-ST, lt-mgy occ brn & brngy, p-mod ind, n-sl calc, f-mg, mica.

CARBIDE LAG
50 min. @ 116 SPM
46 units; 8oz.



SS, p consol-fri, vf-fg, sbang-sbrd, mod srt, n-sl calc, v mica, iron stn, p intra gran ∅, NS-FOC, intbd CLYST, dkbrn-gybrn-gy tan, mod-p ind, n-sl calc, occ blky, mod-occ sl-vslty, occ sdy, occ pyr, occ lrg tuff frag.

2/27/83

BASALT, blk, hd, aphan, gl.

SS, gywh gy, p-mod consol, fri, fg, sbang-sbrd, glau, mica, pyr, calc, mod vis ∅, NSFOC, intbd SLTST, gy occ gybrn, mod-p ind, vfg, gny, glau, sdy-slty, mica, sl-n calc, intbd CLYST, m-dkbrn, mod ind, pyr, gny, n calc.

CALIBRATION
W/ 1% TEST GAS
C1- 6000 DIV
C2- 7750 DIV
C3- 7125 DIV
iC4- 5375 DIV
nC4- 4500 DIV

SS, gy gywh, p-occ mod consol, fri, vf-fg, sbang-sbrd, occ ark, mod srt, glau mica, calc, intbd SLTST, gy, mod-p ind, vf-fg, gny, occ mica, occ sdy, sl-n calc, intbd CLYST, gy-occ brn, mod ind, occ slty-sdy, sl-n calc, incr pyr, tr tuff.

CALIBRATION
W/ 1% TEST GAS
C1- 6000 DIV
C2- 7750 DIV
C3- 7125 DIV
iC4- 5375 DIV
nC4- 4500 DIV

WOB 32
RPM 75/80
PP 1100
SPM 116

SLTST grd to SS, lt-m gy-gybrn, mod-occ w ind, n-mod calc, m-crse-vf g, v mica, occ fe stn.

SLTST, lt-mgy-brngy, mod ind, vf-crse g, v-n mica, occ arg, occ fe stn, n-calc, grd to SS, ltgy, mod consol, vf-fg occ m, sbang-sbrd, mod-w srt, occ slty & arg, v mica, occ fe stn, p intra gran ∅, NSFOC, intbd CLYST, dk-mbrn m-ltgy tan, mod-w ind, sl blky-flky, tr lam, n-v slty, occ shly, n-sl calc.

CALIBRATION
W/ 1% TEST GAS
C1- 7000 DIV
C2- 8875 DIV
C3- 8500 DIV
iC4- 6375 DIV
nC4- 5375 DIV

2/28/83

TG. 235u.(2.35%)

TG. 157u.(1.57%)

WOB 25
RPM 75/80
PP 1100
SPM 116

NOTE: TRIP OUT OF HOLE AND WAIT FOR DIESEL FUEL. LAY DOWN 3 DC. CONTINUE W/ BIT #7.

NOTE: SCALE CHANGE @ 4983'

3/1/83

CARBIDE LAG
53 min. @ 116 SPM
88 units; 11 cm.

SS, gywh, wh, p-mod consol, f-mgr, v mica, sl glau, occ v pyr, calc, p vis ∅, NSFOC.

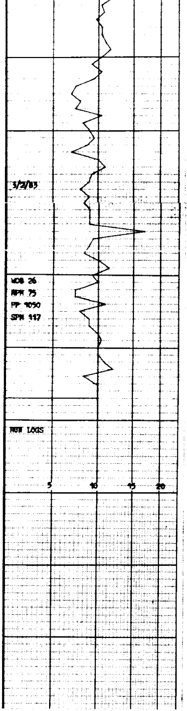
SLTST, gybrn, fgr, mod-p ind, occ sdy, sl-n mica, sl-n calc.

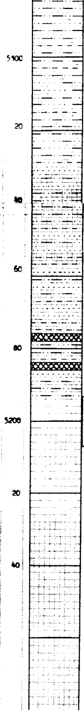
CALIBRATION
W/ 1% TEST GAS
C1- 7000 DIV
C2- 8750 DIV
C3- 8250 DIV
iC4- 6250 DIV
nC4- 5375 DIV

MUD DATA @ 5038'
wt 10.0, fv 39, pH 10.8, fil 5.6, cl 700.

WOB 27
RPM 75
SPM 116
PP 1050

CLYST, dk-m brn&gybrn, tan, mod ind, n-sl calc, mod&sl-n slty, n-sl sdy, occ volc&volc SS clasts, tr pyr, occ shy, tr blky & flky.





SLTST, m-dkgybrn, mod ind, n-sl calc, vf-fgr, sl-mod arg, n-sl sdy, occ volc&volc SS clasts, com pyr, mica, tr carb/coal frags, occ tuff.

SS, strg, lt gy&gngy, mod consol, n-tr mod calc, f-vfgr, mica, slty, p intgran ∅, NSFOC.

SLTST, brn gy, mod ind, vf-mg, occ sdy, sl calc, intbd CLYST, brn buff gy mod ind, slty, gmy, sl calc, tr SS, wh gywh, mod-p consol, sbang-sbrd fg, occ v mica, sl glau, sl-mod calc, NSFOC.

BASALT, gy-blk, hd, gl, vol alt SS, pnk gyblu, v consol, calc.

TD @ 5495' @ 11:35 am. 3/2/83 in C&W SAND of the COWLITZ FM.

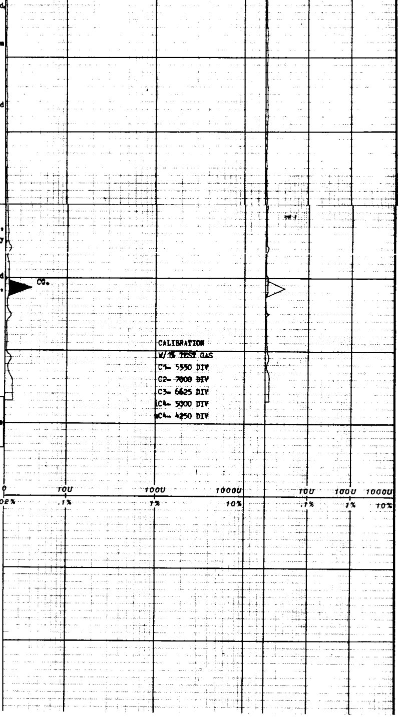
THANK YOU FOR USING THE SERVICES OF ANALEX.

LARRY B. RANDALL

Larry B. Randall

LARRY BAILEY

Larry Bailey



CALIBRATION
W/1% TEST GAS
C1- 5550 DIV
C2- 7000 DIV
C3- 6625 DIV
iC4- 5000 DIV
nC4- 4250 DIV