COMPANY UNION OIL of CAL.
FIELD BACA
WELL #13
COUNTY SANDOVAL
STATE NEW MEXICO
LOCATION
EL. 9292 Gr.

TOTAL DEPTH
SPUD DATE AUG 23, 1974
COMPLETION DATE NOV 5 1974
DRILLING CONTRACTOR LOFFLAND BROS
ENGINEER P.L. Stinnett/INMAN
GEOLOGIST T.R. SLODOWSKI

CASING RECORD
20": 215' to SURFACE, CMTD.
13⅜": 1469' to " "
9⅝": 1270 to " "
7": 8200', hung at 3340'

EXPLANATION

DRILLING
NB - NEW BIT
RRB - RERUN BIT
CCB - CORE BIT
LC - LOST CIRCULATION
DEV - DEVIATION
DST - DRILL STEM TEST

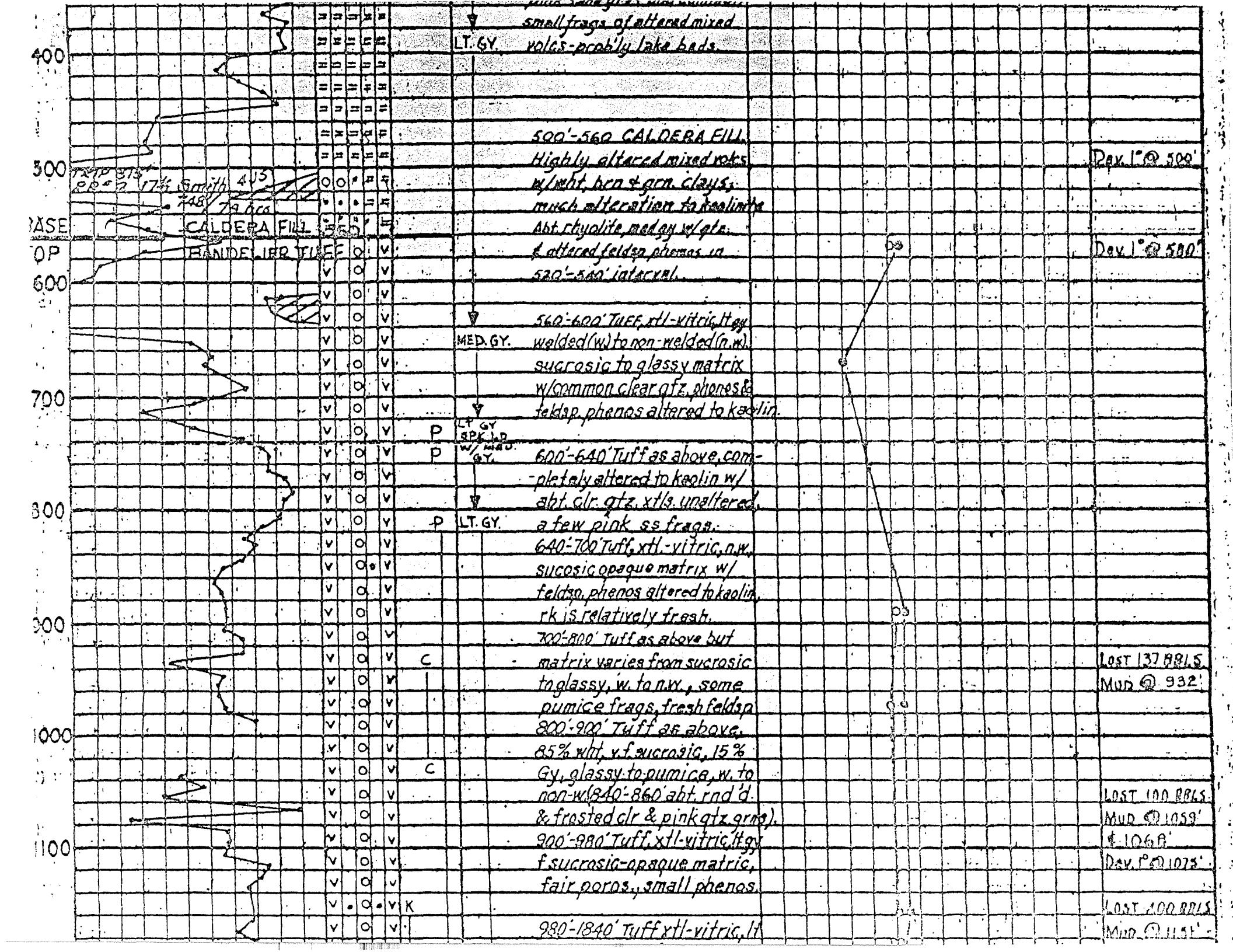
ROCK
SHALE
SILTSTONE
SANDSTONE
CONGLOMERATE
LIMESTONE
DOLOMITE
GYP, ANHYD.
CHERT
VOLCANICS
INTRUSIVE
TUFF
METAMORPHIC

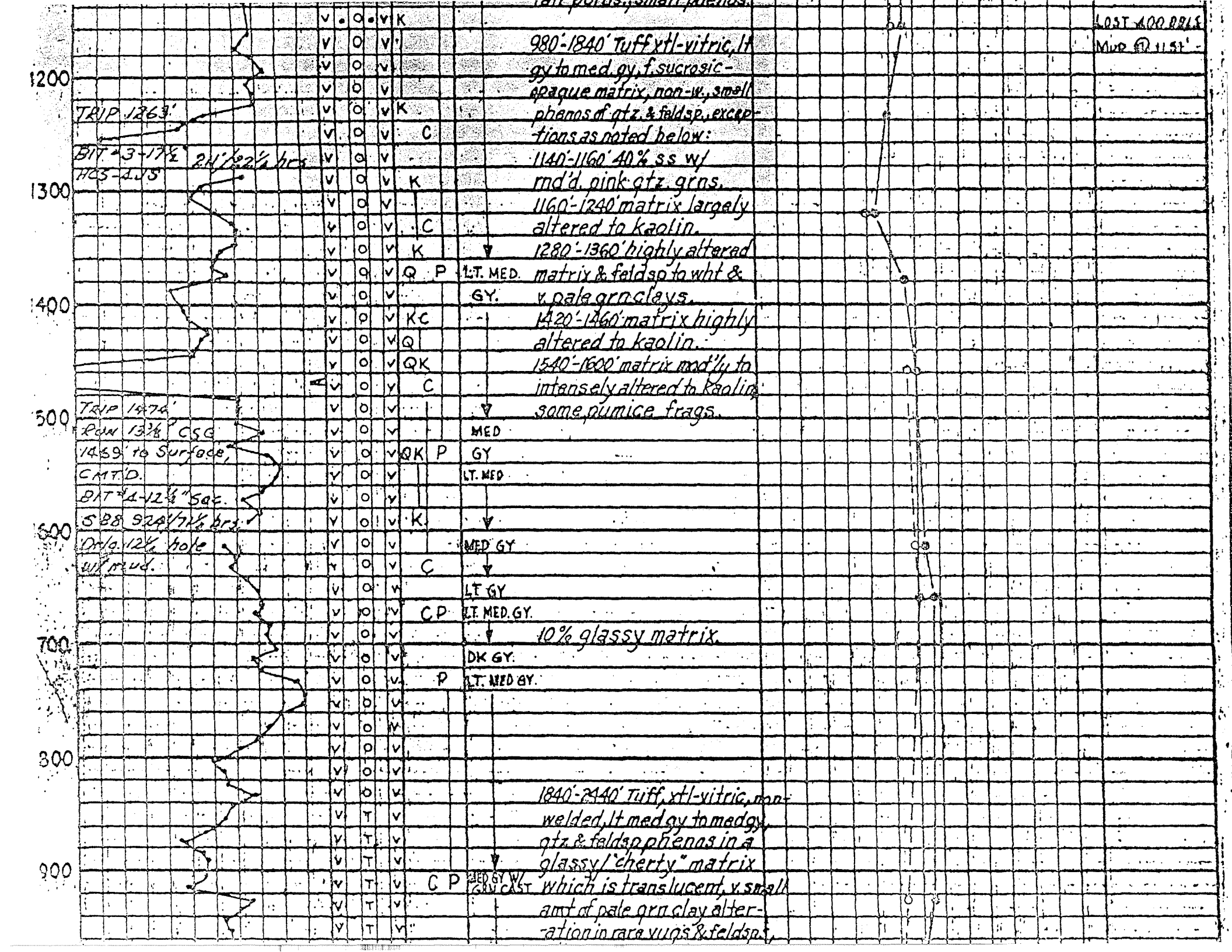
MINERALS
C - CALCITE
CHL-CHLORITE
CEL-CELADONITE
CL - CLAYS
D - DOLOMITE
E - EPIDOTE
F - FELDSPAR
K-KAOLINITE
P - PYRITE
Q - QUARTZ
Z - ZEOLITES
V VEINS
DIS. DISSEMINATED

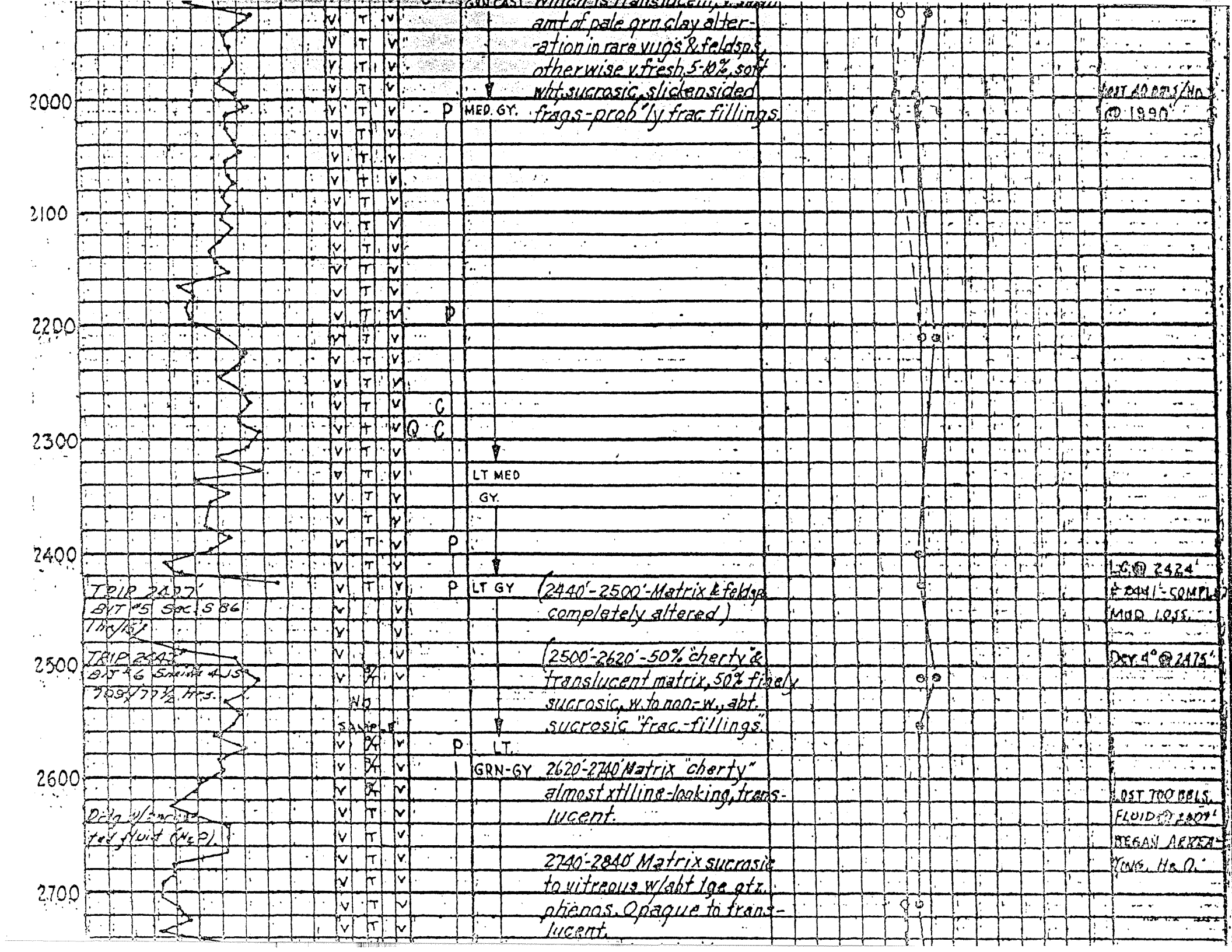
PHYSICAL - CHEMICAL
D.H.-DOWN HOLE
B.H.-BOTTOM HOLE
F.L. FLOW LINE
T. TEMPERATURE
P. PRESSURE
T.C. TIME SINCE CIRCULATION
W.H. WELL HEAD
PPM - PARTS PER MILLION

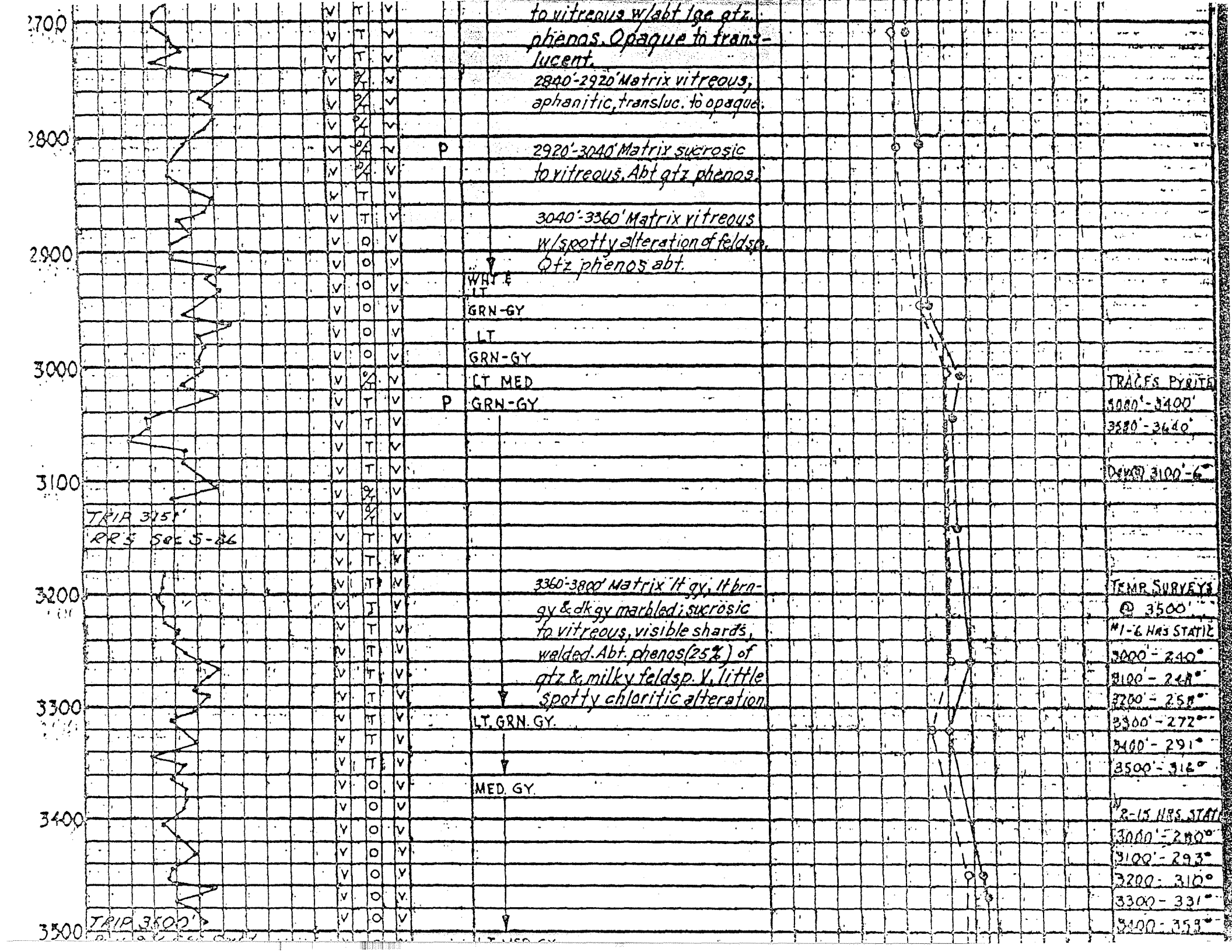
TUFF MATRIX: OPAQUE (O) - TRANSLUCENT (T)

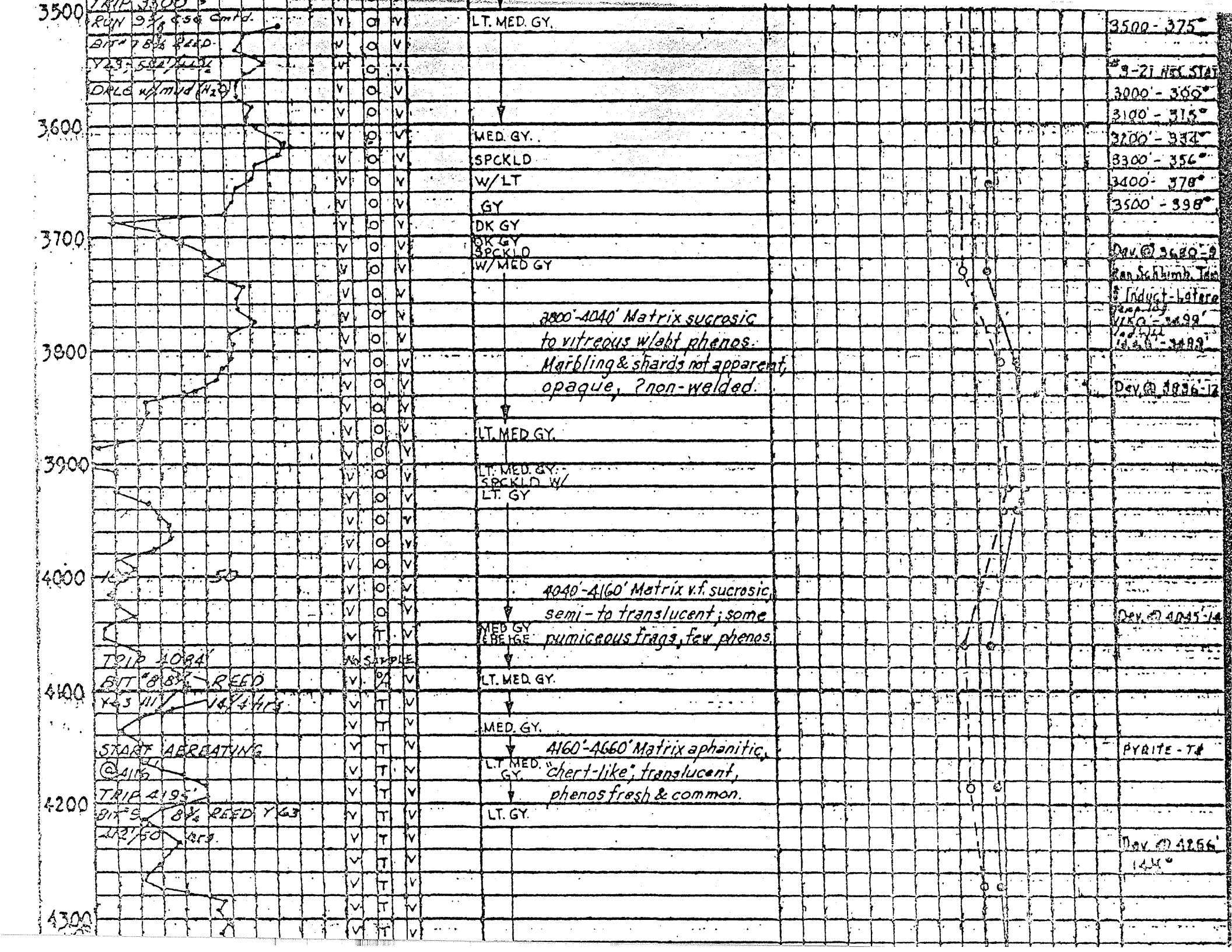
DEPTH	PENETRATION DATA (MIN./10 FT. ☒; FT./HR. ☐; MIN/FT. ☐; 100 — 50 min.)	LITHOLOGY: PRIMARY LITH (100 % 0)	SECONDARY MINERALS	BULK COLOR	DESCRIPTION	PHYSICAL - CHEMICAL DATA (MUD FLOWLINE TEMP. / SUCTION; 100° 150° 200°)	MISC.
	Drilling 17½ Hole w/Mud			LT. MED.	0-100' CALDERA FILL		
	BIT #1-17½ Smith 44-V			BRN.	Brn, Orange-brn, reddish-brn w/d boulders of mixed volcs (largely Bandelier tuff.) Abt. qtz. xtls, clay + volc. sd		
	0-215'/28 Hrs.						Dev ¼° @ 70'
100							
				LT. GY-GRN.	common.		Dev ½° @ 140'
					100'-200' CALDERA FILL clayey sand + sandy clay, lt gy-grn, calc to non-calc, sooty, Translucent, Abt qtz xtls, Sand grns clr to pink qtz.		
200	TRIP 215'						Dev ½° @ 300'
	HO #1-26" Smith TOOTH			LT. GY.			
	20" CSG 215' TO SURFACE						
	Cmtd 820 sx 17½ Smith						
	L&V 300'/41 hrs.				200'-500' CALDERA FILL clay, tuffac. to sandy, lt gy to wht, Kaolinitic, abt. doubly termin'd qtz xtls, some pink sand grns and common		
300				LT. PINK GY.			

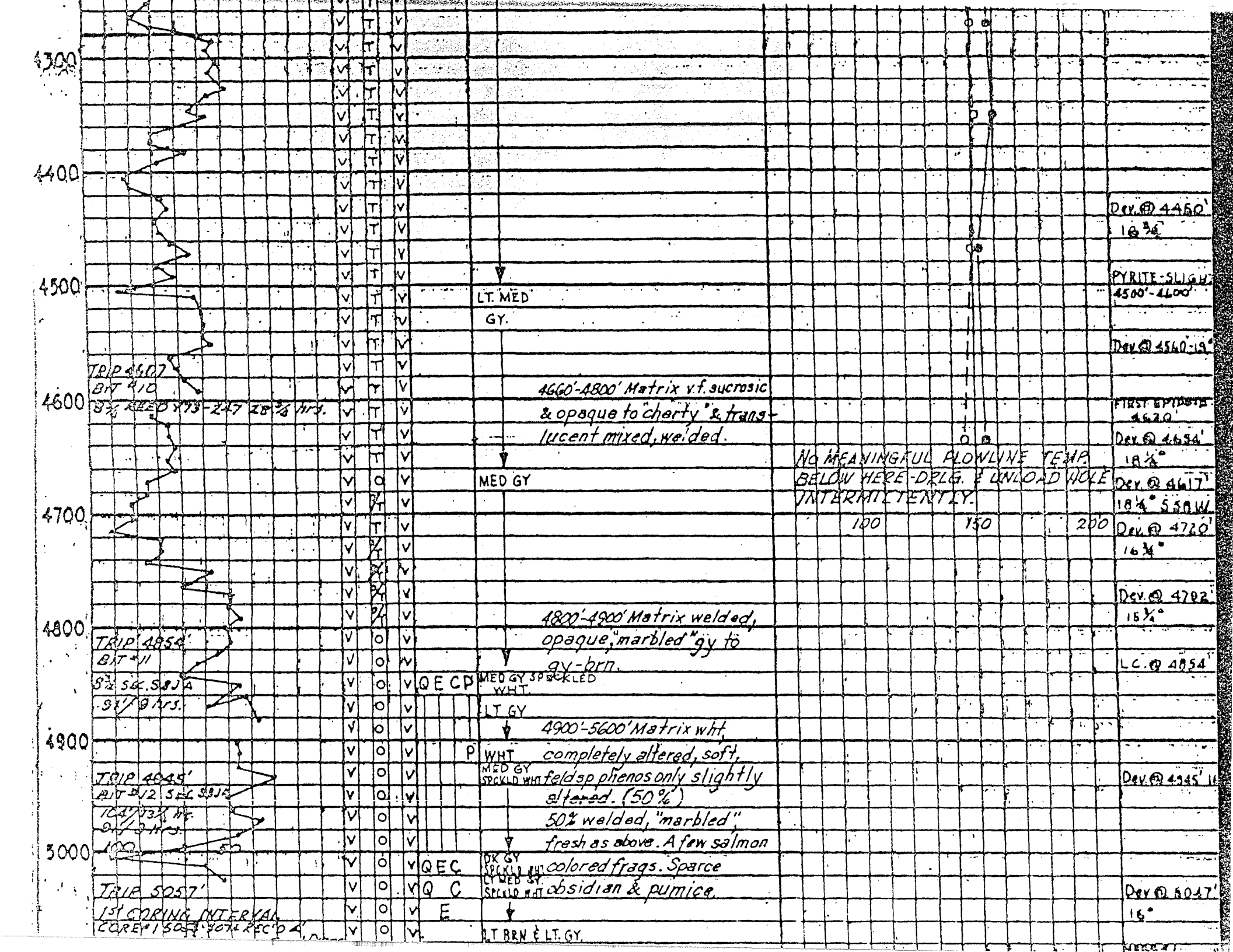

small frags of altered mixed
LT. GY. volcs - probly lake beds.
500'-560 CALDERA FILL.
Highly altered mixed rock
w/wht, brn & grn clays,
much alteration to kaolinite
Abt. rhyolite, med gy w/glass
& altered feldsp phenos in
520'-540' interval.
Dev. 1° @ 500'
Dev. 1° @ 500'
560'-600' TUFF, xtl-vitric, ltgy
MED. GY. welded (w) to non-welded (n.w).
sucrosic to glassy matrix
w/common clear qtz phenos &
feldsp phenos altered to kaolin.
LT GY SPK MED GY
600'-640' Tuff as above, com-
-pletely altered to kaolin w/
abt. clr. qtz. xtls. unaltered,
a few pink ss frags.
LT. GY.
640'-700' Tuff, xtl.-vitric, n.w.
sucosic opaque matrix w/
feldsp. phenos altered to kaolin,
rk is relatively fresh.
700'-800' Tuff as above but
matrix varies from sucrosic
to glassy, w. to n.w., some
pumice frags, fresh feldsp
Lost 137 BBLS
Mud @ 932'
800'-900' Tuff as above,
85% wht, v.f. sucrosic, 15%
Gy, glassy to pumice, w. to
non-w (840'-860' abt. rnd'd
& frosted clr & pink qtz grns).
Lost 100 BBLS
Mud @ 1059'
& 1068'
Dev. 1° @ 1078'
900'-980' Tuff, xtl-vitric, ltgy
f sucrosic-opaque matric,
fair poros., small phenos.
Lost 100 BBLS
Mud @ 1131'
980'-1840' Tuff xtl-vitric, lt
400
500
600
700
800
900
1000
1100
CALDERA FILL
HANDEL IFR TUFF

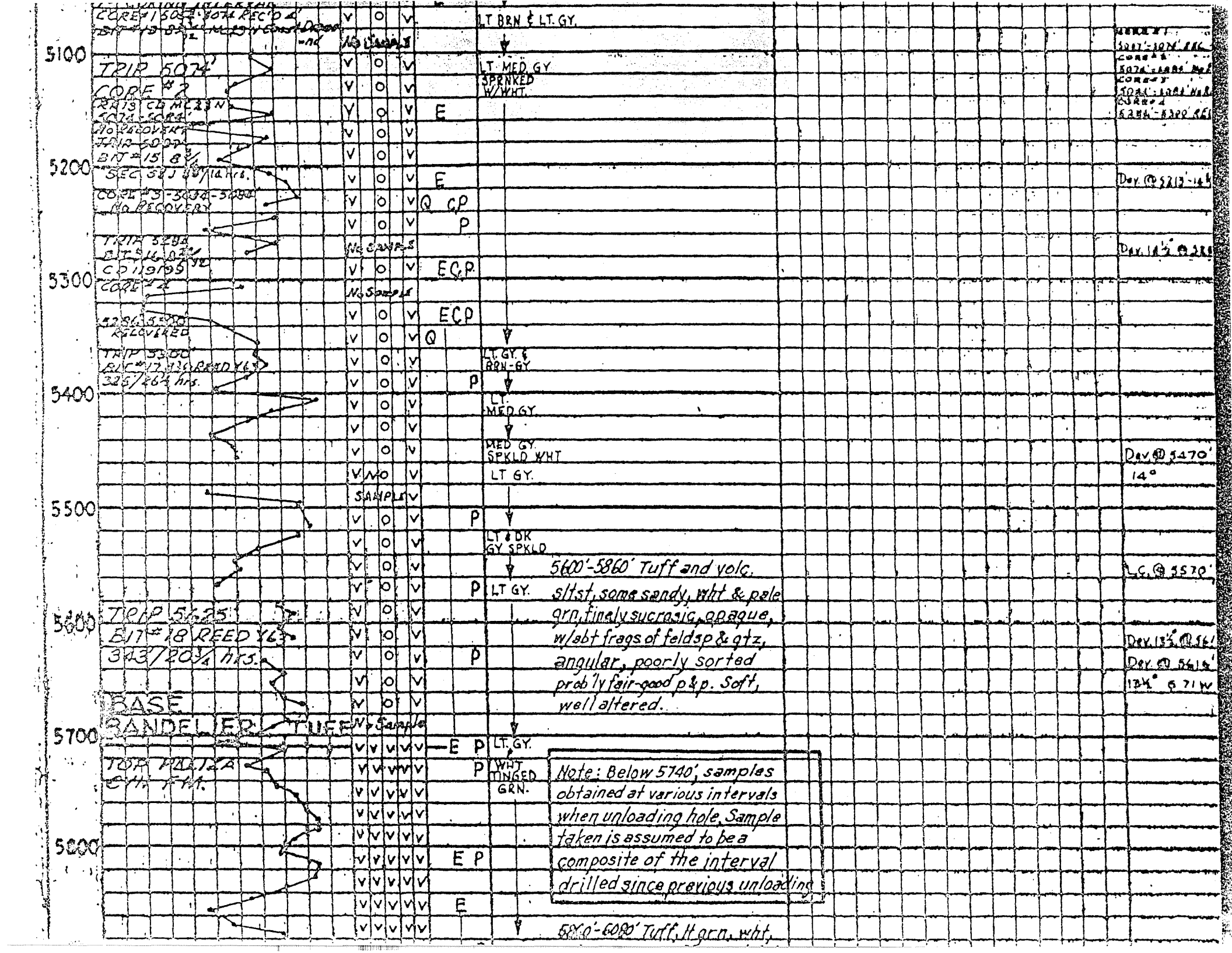

LOST 400 BBLS MUD @ 1151'
1200
TRIP 1263'
BIT #3-17½ 24'/2½ hrs
HOS-4.5
1300
1400
TRIP 1474'
RUN 13⅜" CSG
1459' to Surface,
CMT'D.
BIT #4-12¼" Sec.
S 28 92'/7½ hrs
1500
Drlg. 12¼ hole
w/ mud.
1600
700
800
900
980'-1840' Tuff xtl-vitric, lt gy to med. gy, f. sucrosic - opaque matrix, non-w., small phenos of qtz. & feldsp, except-ions as noted below:
1140'-1160' 40% ss w/ md'd. pink qtz. gras.
1160'-1240' matrix largely altered to kaolin.
1280'-1360' highly altered matrix & feldsp to wht & v. pale gn clays.
1420'-1460' matrix highly altered to kaolin.
1540'-1600' matrix mod'ly to intensely altered to kaolin, some pumice frags.
LT. MED. GY.
MED
GY
LT. MED
MED GY
LT GY
LT. MED. GY.
10% glassy matrix.
DK GY.
LT. MED GY.
1840'-2440' Tuff, xtl-vitric, non-welded, lt med gy to med gy, qtz & feldsp phenos in a glassy / "cherty" matrix which is translucent, v. small amt of pale grn clay alter-ation in rare vugs & feldsp.,
MED GY W/ GRN CAST


2000
2100
2200
2300
2400
2500
2700
MED. GY.
LT MED GY.
LT GY
LT. GRN-GY
(2440'-2500'-Matrix & feldsp completely altered)
(2500'-2620'-50% cherty & translucent matrix, 50% finely sucrosic, w. to non-w., abt. sucrosic "frac.-fillings"
2620'-2740' Matrix "cherty" almost xtlline-looking, translucent.
2740'-2840' Matrix sucrosic to vitreous w/abt 1ge gtz. phenos. Opaque to translucent.
LOST 40 BBLS/HR @ 1990'
LG @ 2424'
2441'-COMPL
MOD LOSS.
DST 4° @ 2475'
DST TOO BBLS. FLUID @ 2807'
REGAN AREA
TONG. No. 0.


2700
2800
2900
3000
3100
3200
3300
3400
3500
to vitreous w/abt 1ge qtz. phenos. Opaque to translucent.
2840'-2920' Matrix vitreous, aphanitic, translucent. to opaque.
2920'-3040' Matrix sucrosic to vitreous. Abt qtz phenos.
3040'-3360' Matrix vitreous w/spotty alteration of feldsp. Qtz phenos abt.
WHITE
LT GRN-GY
LT GRN-GY
LT MED GRN-GY
3360'-3800' Matrix lt gy, lt brn-gy & dk gy marbled; sucrosic to vitreous, visible shards, welded. Abt. phenos (25%) of qtz & milky feldsp. V. little spotty chloritic alteration
LT. GRN. GY.
MED. GY.
P
P
TRACES PYRITE
3080'-3400'
3580'-3640'
TRIP 3151'
RR'S Sec 5-26
TRIP 3500'
TEMP SURVEYS
@ 3500'
M1-6 HRS STATIC
3000'-240°
3100'-248°
3200'-258°
3300'-272°
3400'-291°
3500'-316°
8-15 HRS STAT
3000'-290°
3100'-293°
3200'-310°
3300'-331°
3400'-353°


3500
3600
3700
3800
3900
4000
4100
4200
4300
TRIP 3500'
RUN 9 7/8" @ 3504' Cmtd.
BIT #7 8 3/4 REED
Y23; 502'/11 1/2 HRS
DRLG w/ gel mud (H2O)
LT. MED. GY.
MED. GY.
SPCKLD
W/LT
GY
DK GY
DK GY
SPCKLD
W/MED GY
3800'-4040' Matrix sucrosic to vitreous w/lgt phenos. Marbling & shards not apparent, opaque, ?non-welded.
LT. MED. GY.
LT. MED. GY.
SPCKLD W/
LT. GY
4040'-4160' Matrix v.f. sucrosic, semi- to translucent; some pumiceous frags, few phenos.
MED GY & BEIGE
TRIP 4084'
NO SAMPLE
BIT #8 8 3/4 REED
LT. MED. GY.
MED. GY.
START AERATING @ 4170'
4160'-4660' Matrix aphanitic, "chert-like", translucent, phenos fresh & common.
L.T. MED. GY.
TRIP 4193'
BIT #9 8 3/4 REED Y63
202'/60 HRS.
LT. GY.
3500' - 375°
#9-21 HRS STAT
3000' - 360°
3100' - 375°
3200' - 393°
3300' - 356°
3400' - 378°
3500' - 398°
Dev @ 3680' - 9
Ran Schlumb. Tan
Induct-Latera
Dev @ 4045' - 14
PYRITE - T
Dev @ 4266'
14½°


4300
4400
4500
4600
4700
4800
4900
5000
LT. MED GY.
MED GY
4660'-4800' Matrix v.f. sucrosic & opaque to "cherty" & translucent mixed, welded.
4800'-4900' Matrix welded, opaque, "marbled" gy to gy-brn.
4900'-5600' Matrix wht, completely altered, soft, feldsp phenos only slightly altered. (50%)
50% welded, "marbled", fresh as above. A few salmon colored frags. Sparce obsidian & pumice.
LT BRN & LT. GY.
MED GY SPECKLED WHT
LT GY
WHT
MED GY SPCKLD WHT
DK GY SPCKLD WHT
LT MED GY SPCKLD WHT
TRIP 4607'
BIT #10
8¾ REED X73-247 28⅞ HRS.
TRIP 4854'
BIT #11
8¾ SK. SBJA
31' 9 HRS.
TRIP 4945'
BIT #12 SEC SBJA
104' 23¾ HRS.
9½ 3 HRS.
TRIP 5057'
1ST CORING INTERVAL
CORE #1 50' 50% REC'D
Q E C P
Q E C
Q C
E
No MEANINGFUL FLOWLINE TEMP. BELOW HERE-DRLG. & UNLOAD HOLE INTERMITTENTLY.
100
150
200
Dev. @ 4460' 18 3/4°
PYRITE-SLIGHT 4500'-4600'
Dev. @ 4560' 19°
FIRST EPIDOTE 4620'
Dev. @ 4634' 18 1/4°
Dev. @ 4617' 18 1/4° S 58 W
Dev. @ 4720' 16 1/4°
Dev. @ 4782' 15 1/4°
LC. @ 4854'
Dev. @ 4945' 11
Dev. @ 5047' 16°


5100
5200
5300
5400
5500
5600
5700
5000
LT BRN & LT. GY.
LT. MED GY SPRNKED W/WHT.
LT. GY. & BRN-GY
LT. MED GY.
MED GY. SPKLD WHT
LT GY.
LT & DK GY SPKLD
LT. GY.
WHT TINGED GRN.
5600'-5860' Tuff and volc. sltst, some sandy, wht & pale grn, finely sucrosic, opaque, w/abt frags of feldsp & qtz, angular, poorly sorted prob'ly fair-good p&p. Soft, well altered.
Note: Below 5740', samples obtained at various intervals when unloading hole. Sample taken is assumed to be a composite of the interval drilled since previous unloading
5860'-6080' Tuff, lt grn, wht,
BASE BANDELIER TUFF
Dev. @ 5470' 14°
Dev. @ 5613'
Dev. @ 5618' 12¼° S 71 W

5800

5900

6000

6100

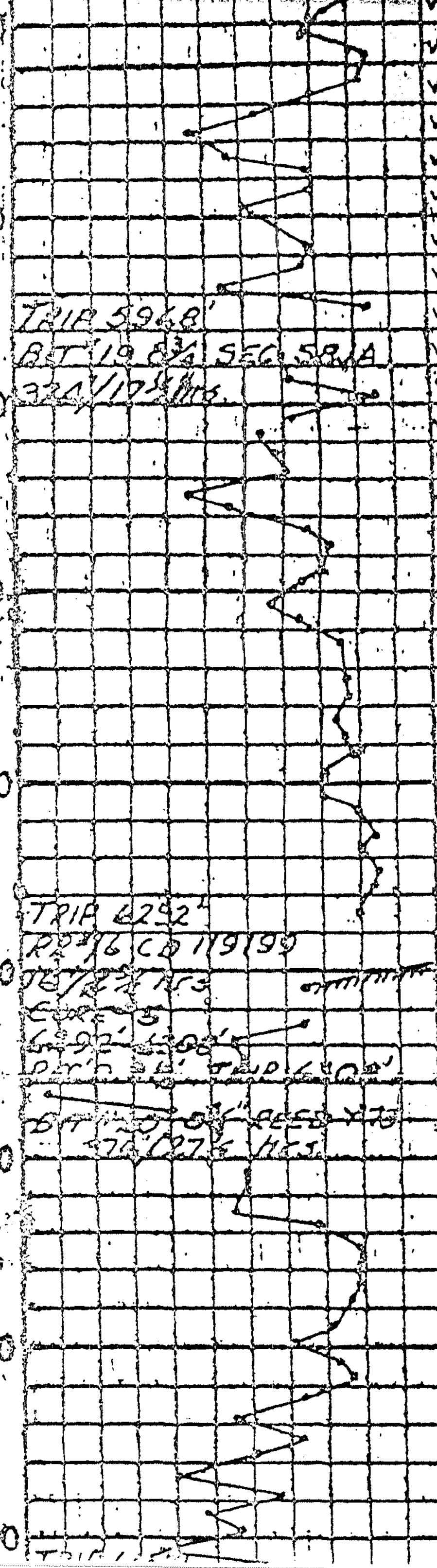
6200

6300

6400

6500

6600



Depth	Lithology log code	Color	Description	Remarks
5800	E P		taken is assumed to be a composite of the interval drilled since previous unloading	
	E			
5900	P	LT GRY-GRN	5860'-6080' Tuff, lt grn, wht, v.f. sucrosic, soft completely altered, v. sparse qtz & milky feldsp., dissem. red pyrite & vein epidote. Much chloritic alteration. Some tuff breccia.	Dev. 12¼ @ 59[illegible]
6000	E		Near base, some fresh gy, mottled aphanite w/micro-laths of feldsp.	
	E			
	EP		6080'-6280' Completely altered but appears to be tuff, chert-like aphanite and	
6100	E P		feldsp porph. Porphyry matrix is sucrosic (altered) w/abt v. small fresh feldsp laths,	
6200	P		& sparse v. large equant	
	E		feldsp. Abt spotty chlerite.	Dev @ 6260 11¼°
	E P	DK GY.	6280'-6560 Andesite porph. Med. gy, v.f. xtln to aphanitic	
6300			matrix w/v. sparse, lge, milky fresh feldsp phenos w/indistinct	Core # 5 6292'-630[illegible] Rec'd 9½'
	P		borders. Minor dissem pyrite,	
	E		sparse magnetite. No otr dk mins.	
6400	E P	MED GRN. GY		Dev @ 64[illegible] 10¼° [illegible] 643[illegible]
6500	EC		6560'-6775' Andesite porph.,	
	E		med to dk gy, some grn	
	EC	MED GY GRN & DK GY.	tinge, finely xtln matrix,	
6600		DK GY.	relatively fresh w/common	
	EC		lge milky feldsp and some	

6600

TRIP LAST
BIT #21 8½ REED Y73
392'/26½ hrs

EC — DK GY. — relatively fresh w/common lge milky feldsp and some clear feldsp phenos, Rare

EC — LT. & DK. GY. — frags of pale blue opal.

Below 6640' ~ 50% of frags are highly altered, soft, lt gy.

6700

P — Dk red pyrite appears about 6700'.

EC P.

LT GN-GY.

E P — GRN. GY.

DK. red pyr below 670[…]

6800

ECP. — 6775'-6860' VOLC. SS, pale grn, lt gy, wht, some lavender & pink speckling, v poor sorting, clasts ang to sub-rnd, well-cmtd to porcellaneous, common magnetite.

6900

6860'-7020' TUFF & PORPH'TIC. APHANITE
Tuff is pale grn, wht, pink & lavender, v.f. sucrosic, some pink qtz ss.

7000

TRIP 7045'
BIT #22 SEC 8 8½"
266'/20½ hrs

ECP — GRN. GY SPCKLD DK GY.

LT. MED GY. — Aphanite is purple w/sparse lge feldsp

ECP

E P — phenos; rk is fresh.

7100

MIXED GY & DK RED BRN.

7020'-7100' PORPH'TIC APHANITE, gy & purple-gy pale grn, common zoned feldsp to 7040'.

C

7200

E

E — 7100'-7440' SS & PORPHYRY.

C — Porphyry is gy & gy/red-brn mottled, w/milky

TRIP 7311'
BIT #23 SEC M8 8½"

GRN-GY

7300

feldsp & clear qtz phenos, fresh w/spotty chlorite, some epidote veins.

Dev @ 73[…] 8½° S16

P

E P — SS (50%) is red-brn, fine, poorly sorted w/20% to 50% ang to sub-rnd,

7400

7100-7440 SS & PORPHYRY

Porphyry is gy & gy/red-GRN-GY brn mottled, w/milky feldsp & clear qtz phenos, fresh w/spotty chlorite, some epidote veins.

SS (50%) is red-brn, fine, poorly sorted w/20% to 50% ang to sub-rnd qtz clasts, sparse feldsp altered to chlorite & volc. PURPLE & DK RED-BRN PURPLE-GY rk frags, in a siliceous (?) red clay matrix (pudding-stone appearance).

Pastel colors prevail below 7260 & SS matrix becomes tuffaceous.

7440-7530' TRANSITIONAL

Fresh, mottled red-brn & lav. some purple, finely xtln w/oriented micro-lites of feldsp.

DK PURPLISH GY

7530'-8090' Aphanitic flowrk, lt med gy, translucent w/abt needles of pyribole (hnblende ?), & V. sparse lge feldsp. & thick books chloritized mica phenos. Rare qtz. phenos. Some in bd volc. SS. Some magnetite w/ red-brn coronas. Rk is relatively fresh - 5-15% altered frags.

MED GY

LT. GY

MED DK GY

MED DK GY

8090'-8228' SS, pink, wht, red, pale grn, lt gy, fine, subang to subrnd, clear

Test: Open hole - 8½" Orifice

TIME	TEMP	PRESS
½ hr	285°	56#
1 hr	275°	68#
1½ hr	280°	68#
Shut-in to pump ½ Q from pit 1½ hr.		
3½ hr	275°	68#
3½ hr	310°	75#
Shut-in 3½ hrs to pump ½ Q from pit.		
8 hr	200°	1#
9-11 hrs	195°-180°	?-

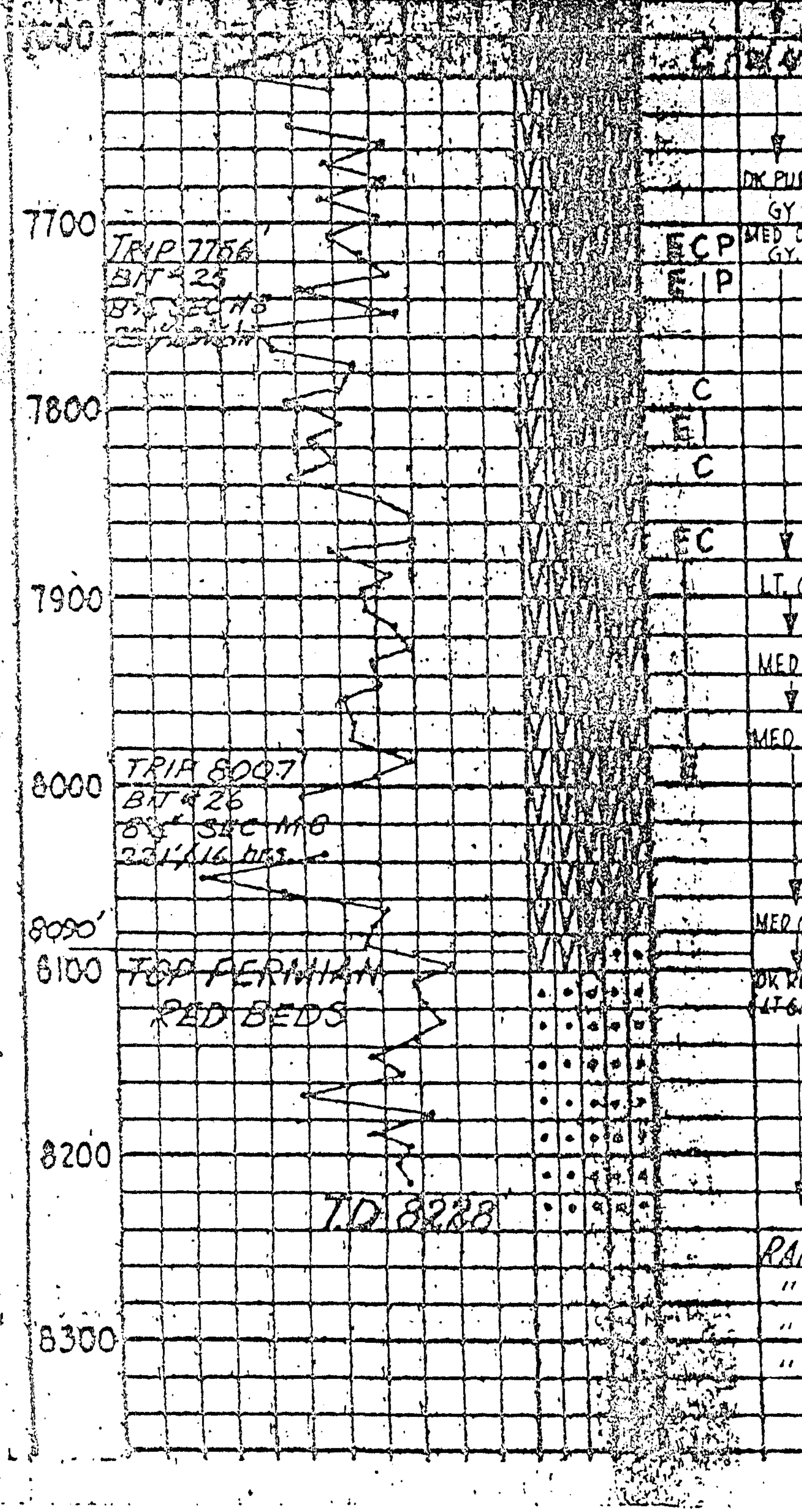
TRIP 7311' BIT #23 SEC NB-8¼" 22½ X 2½ JR

TRIP 7503 BIT #24 SEC NB-8¼" 22½ X 2½ JR

TRIP 7756' BIT #25 SEC NB-8¼" 22½ X 2½ JR

TRIP 8007 BIT #26 SEC NB-8¼" 22½ X 2½ JR

Dev @ 7311' 8¼" SIC



7440-7530' ANDESITE [illegible]
Fresh, mottled red-brn. & lav. some purple, finely xtln w/oriented microlites of feldsp.

7530'-8090' Aphanitic flowrk, lt med gy, translucent w/abt needles of pyribole (hnblnde ?), & v. sparse lge feldsp. & thick books chloritized mica phenos. Rare qtz. phenos. Some in b'd volc. SS. Some magnetite w/ red-brn coronas. Rk is relatively fresh - 5-15% altered frags.

8090'-8228' SS, pink, wht, red, pale grn, lt gy, fine, subang to subrnd, clear frosted qtz, sparse feldsp & pink qtz. 5-25% red clay matrix, slight to abt calcite cement. Poor porosity.

TEST: Open hole - 8½" Orifice

TIME	TEMP	PRESS
½ hr.	285°	66#
1 hr.	275°	68#
1½ hr.	280°	68#
Shut-in to pump H_2O from pit 1¼ hr.		
3½ hr.	275°	68#
3⅝ hr.	310°	75#
Shut-in 3¼ hrs to pump H_2O from pit.		
8 hr.	200°	1#
9-11 hrs.	195°-160°	2#

KILL WELL. RIH - no bridges; fill to 8200'. Run in 7" liner to 8200'.

Dev @ 8. 9°-S52

RAN Temp. LOG 2640'-8228' (pumping H_2O into hole during logging)
" NEUTRON-DENSITY LOG 3494'-6809'
" DUAL INDUCTION-LL 3494'-6813'
" SONIC LOG 3491'-7240'