

BENCH MARK GEOLOGICAL SERVICES

HYDROCARBON WELL LOG

RECEIVED
MAY 4 1991
OIL CON. DIV.
DIST. 3

ABBREVIATIONS

CO — Circulate Out
CG — Connection Gas
CB — Core Bit
DC — Depth Correction
DS — Directional Survey
DST — Drill Stem Test
DTG — Down Time Gas
FC — Filter Cake
LAT — Logged After Trip
NB — New Bit
NDR — No Data Recorded
NR — No Returns
PP — Pump Pressure
RPM — Rotary Speed
SPM — Pump Strokes
TG — Trip Gas
TGR — Trip Gas Recycle
Vis — Viscosity
WL — Water Loss
WOB — Weight on Bit
WT — Density Of Drill Fluid

LITHOLOGY MODIFIERS

/// — Anhydritic
B — Bentonitic
+ — Calcareous
■ — Carbonaceous Coaly
△ — Dolomitic
F — Fungus
~ — Gypsiferous
○ — Onitic
p — Pyritic
△ — Siliceous

OPERATOR — BLACKWOOD AND NICHOLS

WELL — NE Blanco Unit 404R

FIELD — Basin Fruitland Coal

LOCATION — sec 34 T31N R7W

CO/STATE — San Juan Co., New Mexico

ELEVATION KB — 6309 ft. GL — 6295' (ungrd)

SPUD DATE —

INTERVAL LOGGED — 2870 — 3182 ft. (TVD)

DATE LOGGED — 10/24 thru 10/25/90

LOGGING GEOLOGISTS — Randy Laney, Mike Mixer

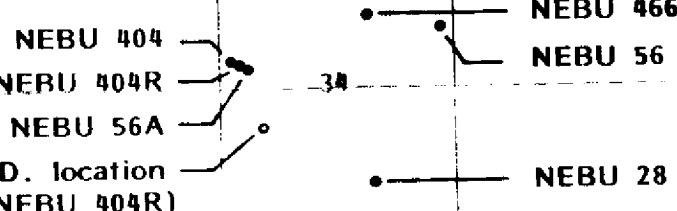
INSTRUMENTATION — FID Chromatograph and Total Gas Detector, Infrared CO₂ Detector

WELL LOCATION

NEBU 404R

Surface location:
379' FWL, 1741' FNL

T.D. location:
917' FWL, 2135' FSL



LEGEND — GAS CURVES

TOTAL GAS	T
METHANE	1
ETHANE	2
PROPANE	3
ISO & N-BUTANE	4
OIL INDICATOR	$\frac{C_2 + C_4}{C_1}$ 0

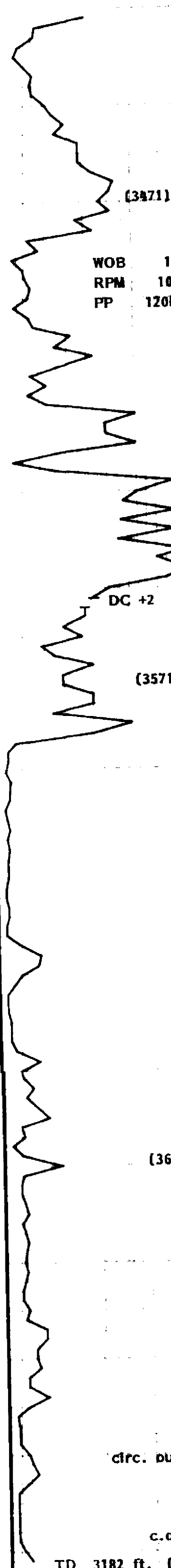
HYDROCARBON ANALYSIS

TOTAL GAS			Reported in Units	
10	100	1000	10	100
GAS CHROMATOGRAPHY			Reported in PPM	
100	1000	10000	100	1000
OIL INDICATOR			Dimension Less	
0.01	0.1	1.0	0.01	0.1

RATE OF PENETRATION

Min. Ft.
STC FDTL 6' 3/4"
3-24's

2.5 5 7.5 10



DEPTH

CONF. DIS. TEST

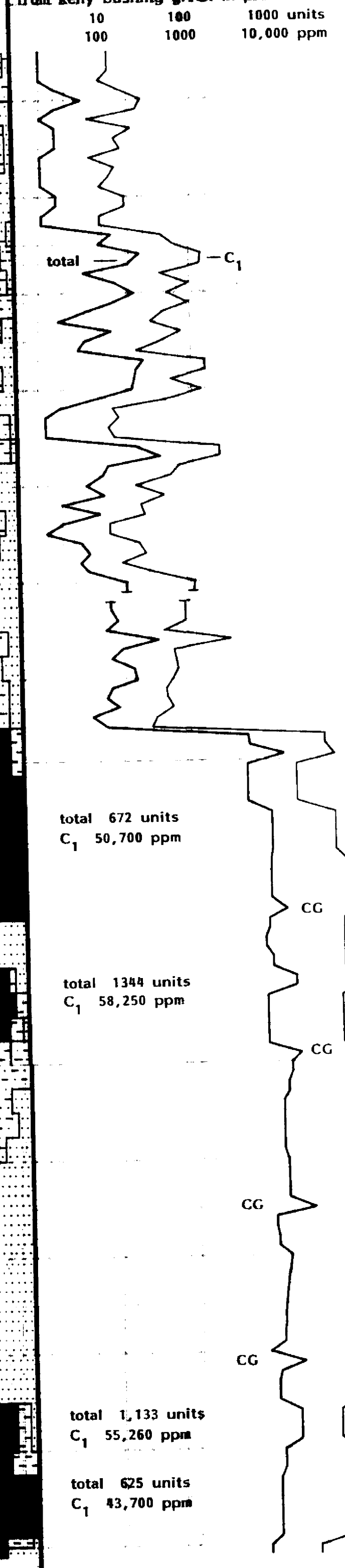


LITHOLOGY OBSERVED

%

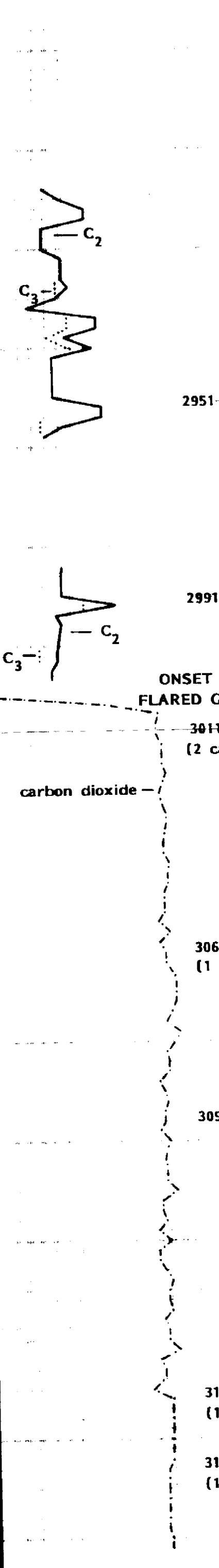


7 5/8" casing set at 2870 ft. (TVD)
NOTE: The 9 7/8" topset portion of this well was directionally drilled and reached T.D. at a measured depth of 3441 ft., true vertical = 2870 ft. with less than 1° deviation from the vertical. All depths on this log are given as true vertical depths (TVD); measured depths (MD) from kelly bushing given in parenthesis.



5 ft. sample interval
Drilling with water
Depth of Coal Intervals
(# of canistered samples)

heavies 100 1000 ppm
CO₂ 1000 10,000 ppm



Sh lt-med gy, sub ply
sub blk, firm, earthy,
non calc, gen non carb,
w/ occ coaly laminae-
grains, intbd w/ med
brn gy, non carb Sltst
Ss med gy, gen f gr,
sub ang, fair srt, non
disagg, fros, occ carb
grs, calc cmt w/ some
wh calc clyst, NS
Sh v dk brn-lt blk
brn, platy-sub ply, frm
sub res-earthly, mod-v
carb w/ mod abnt blk
vit Coal as lenses &
dispersed fine grains
Ss lt gy wh-dk gy, sub
ang, f gr, mod firm, fros
mod-v calc cmt w/ wh
calc clyst, some bronze
mica flakes, NS
Coal blk, sub platy-
rare blk, pred sub vit
w/ occ coarse vit lens
some carb, some gy calc
in frags, poor quality
Ss med gy wh, f-occ m
gr, sub ang-sub rd, fair
sorting, fros, non dis-
agg, mod calc cement,
peppered w/ carb grs,
NS
Sltst mottled gy brn,
sub blk, firm, sli-mod
calc, carb in part w/
some intbd sub vit-vit
sub blocky Coal
Coal gen black, sub
blocky to some blocky
at top becoming much
more blk w/ very good
cleat development &
coch frac to base, 20-
25% finely-coarsely
banded vit at top; 60-
75% massive vit at
base, mod carb at top,
no resin some pyr nod.
at base, scattered gy
per calc, fair coal at
top, good to excellent
quality at base
Coal blk, gen blk w/
fair coch frac, 50%
mass-coarsely vit w/
some carb, dk brn clyst
intbds, good quality
Sltst m gy brn-brn,
sub blk, firm, mod calc
w/ carb-coaly material
mod argill, intbd w/
blk, vit Coal as above
T/ P.C. Tongue 3100'
Ss lt brn gy S&P, f gr
mod well srt, pred cir-
some fros qtz grs, sub
ang, sli & sli calc cmt
glauc & carb grs, non-
disagg, tr blk dd int-
gran residue, tr pale
yel flor, NC
Ss med brn gy S&P, f
gr, gen as above, ang-
sub rd, sli more calc,
some argill cmt, intbd
w/ dk brn carb Sltst
Coal blk, gen blocky
text w/ v good coch
frac & cleat develop-
ment, 70-90% massive
vit-sli better at base
w/ little carb, no resin
or sec calc, some term-
inated qtz xl clusters
excellent quality coal
best of well
T/ Main P.C. 3180'
TD sample- Ss med gy
S&P, f gr, sub ang, fros
mod srt, glauc & carb-
coaly grs, NF, NC