

BENCH MARK GEOLOGICAL SERVICES

HYDROCARBON WELL LOG RECEIVE

MAR 9 1990

OIL CON. DIV.
DIST. 3

OPERATOR BLACKWOOD AND NICHOLS

WELL NE Blanco Unit 471

FIELD Basin Fruitland Coal

LOCATION sec 25 T31N R8W

CO/STATE San Juan Co., New Mexico

ELEVATION KB 6415 ft. GL 6901 ft.

SPUD DATE _____

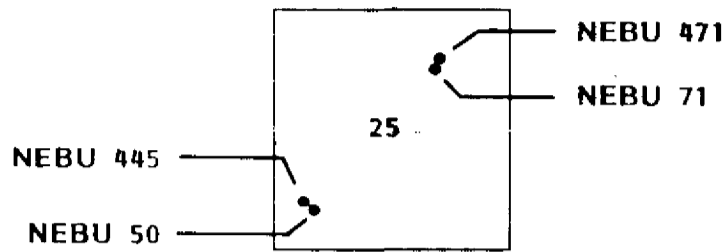
INTERVAL LOGGED 2970 - 3299 ft.

DATE LOGGED 3/9 thru 3/10/90

LOGGING GEOLOGISTS Randy Laney, Mike Mixter

INSTRUMENTATION FID Chromatograph and Total Gas Detector, Infrared CO₂ Detector

WELLLOCATION _____



LEGEND—GAS CURVES

TOTAL GAS	T
METHANE	1
ETHANE	2
PROPANE	3
ISO & N-BUTANE	4
OIL INDICATOR $\frac{C_2 + C_3}{C_1}$	0

HYDROCARBON ANALYSIS

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

7" casing set at 2970 ft.

5 ft. sample interval
Drilling with fresh water

Depth of Coal Intervals
(# of canistered samples)

100 units Total Gas = 18 methane
10 100 1000 units
100 1000 10,000 ppm

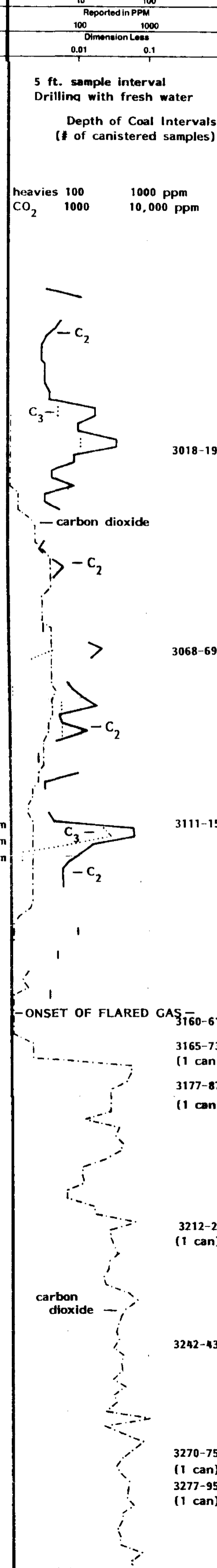
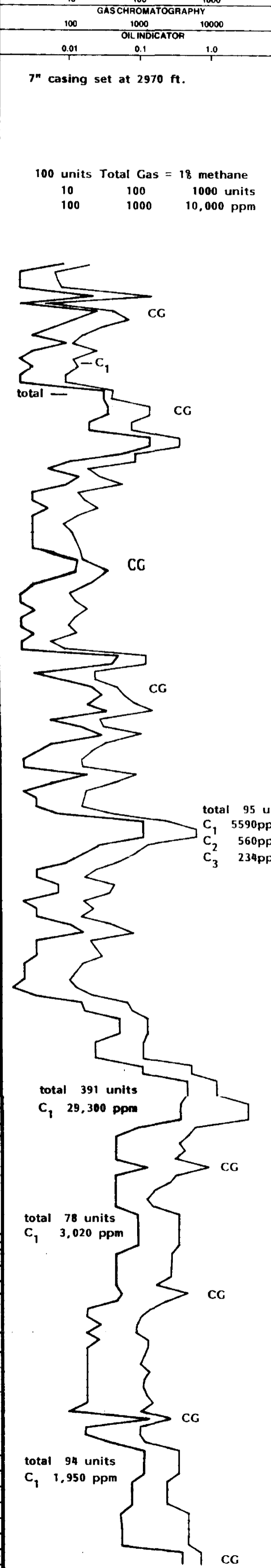
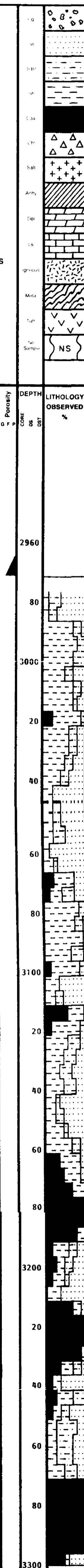
heavies 100 1000 ppm
CO₂ 1000 10,000 ppm

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
C --- Carbonaceous
F --- Fossiliferous
G --- Glauconitic
O --- Oolitic
P --- Pyritic
S --- Siliceous



Visual Show Lithology Interpretation

Lithology Descriptions and Remarks

Ss gy wh to cream, vf gr, sub ang, gen poor sorting, sample disagg, v calc cement w/ wh clyst, NS

Sh med brn to v dark brn-brn blk, ben sub platy, soft, earthy-sub resinous luster, mod-v carb, interlam w/ black, sub vit coal

Ss cream to lt gy, sub ang-sub rd, poor-fair sorting, f-vf gr, sample disagg, v calc cement, NS

Sh lt-med brn, some dk brn, platy-sub blk, mod firm, earthy-occ sub resinous, mod carb w/ occ paper thin coaly laminae

Coal blk w/ some brn-blk, sub platy-sub blocky, laminated vit & sub vit

Sh dk brn, v dk blk-brn, platy-sub platy, soft, resinous-sub vit luster, v carb w/ inter-lam vitreous coaly lenses, grading to shaley coal

Coal brn blk & blk, pred sub platy, gen sub vitreous w/ finely atriated vit coal, mod carb, poor quality

Sltst med gy brn, sub platy-sub blocky, firm, gen sli carb, sli calc

Ss lt gy brn, cream, vf-f gr, sub ang-sub rd, mod srt, sample disagg, mod calc, NS

Coal black & dk gy blk, sub blocky, pred sub vit w/ 30% vitreous as banding & striations, some carb material, fair quality

Coal pred blk, fair-good blocky texture w/ some conch frac, more massive & vit than above, good quality

Ss brn gy, vf-f gr, sub ang-sub rd, p-fr srt, silty in part, calc cement, NS

Coal pred black, good blocky texture w/ conch frac, massive-50 to 60% vitreous, very little banding, very little carb, tr amber resin, very good coal

Ss med gy brn, vf gr, poor sorting, sub ang, mod-sli calc, very silty in part, occ carb grs & laminae, NS

Sltst med brn, gy brn, sub blocky, sli calc, some dissem coaly material, occ sandy

Coal pred black, good blocky texture w/ conch frac, 50-75% vit luster, massive, very little carb material, some calc xls in Sh breaks, very good coal best of well

T/ Main P.C. 3297'

TD sample- Ss med-lt brn, tan-gy S&P, pred f gr, sub ang-ang, w/ qtz overgrowths, sli calc, carb grs-occ coal lam, glauc grs, tr med brn dd intgran resd, tr pale gold flor, NC