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OIL CON. DIV.
DIST. 3

BENCH MARK GEOLOGICAL SERVICES

HYDROCARBON WELL LOG

OPERATOR Blackwood and Nichols

WELL NE Blanco Unit 412 FIELD

LOCATION sec 29 T31N R7W CO. STATE San Juan Co., New Mexico

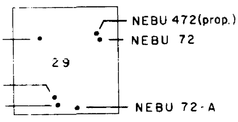
ELEVATION KB 6303 ft. GL 6289 ft. SPUD DATE

INTERVAL LOGGED 2892' - 3189' DATE LOGGED 1/18/90

LOGGING GEOLOGISTS Danny Wyckoff, Randy Laney, Monte Anderson

INSTRUMENTATION FID chromatograph and total gas detector, Infrared CO_2 detector

WELL LOCATION



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

ABBREVIATIONS

OC - Circulate Out
GC - Circulate Gas
CB - Core Bit
DC - Depth Correction
DS - Directional Survey
DST - Drill Stem Test
DTG - Down Time Gas
FC - Fill Cave
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 Reverse
VIS - Viscosity
W - Water Loss
WOB - Weight on Bit
WT - Density Of Drilling Fluid

LITHOLOGY MODIFIERS

// - Argillaceous
B - Bentonite
⊥ - Calcareous
▬ - Carbonaceous Coaly
∠ - Dolomitic
F - Ferruginous
∿ - Glauconitic
♦ - Oolitic
P - Pyritic
Λ - Siliceous

HYDROCARBON ANALYSIS

TOTAL GAS	GAS CHROMATOGRAPHY	OIL INDICATOR
10 100 1000	100 1000 10000	0.01 0.1 1.0

Reported in Units	Reported in PPM	Dimension Less
10 100	100 1000	0.01 0.1

RATE OF PENETRATION Min./Ft.

STC FDT 6 1/4"

2.5 5 7.5 10

WOB 12
RPM 100
PP 900

DC +2

TD 3189 ft.

Porosity G F P

CORE DST

DEPTH: 2880, 2900, 20, 40, 60, 80, 3000, 20, 40, 60, 80, 3100, 20, 40, 60, 80, 3200

LITHOLOGY OBSERVED %

NS

7" casing set at 2892 ft.

5 ft. sample interval
Drilling with fresh water.

Depth of Coal Intervals
(# of canistered samples)

100 units Total Gas = 1% methane
10 100 1000 units
100 1000 10,000 ppm

heavies 100 1000 ppm
CO 1000 10,000 ppm

Total - CG CG CG

total 1920 units
C_1 83,540 ppm

total - C_1

total 1953 units
C_1 131,180 ppm

CG CG CG

total 85 units
C_1 4,490 ppm

C_1 C_2 C_3 carbon dioxide

2913-16 (1 can)

3023-33 (1 can)

3035-58 (3 cans)

CO_2 off scale at 18,000 ppm

3060-62

3077-82 (1 can)

CO_2 off scale 18,000 ppm

3091-93

3108-09

3114-15

carbon dioxide

3164-71 (1 can)

3173-86.5 (2 cans)

Visual Show G F P T

Lithology Interp.

Lithology Descriptions and Remarks

Ss m gy,f gr-occ vf gr,sb ang,fros,pr-mod srt,v calc cmt,argill in part,tt,NS

Coal blk,sb blky-blky w/ occ conch frac-some natural partings,pred all vit luster w/ some finely banded sb vit, good quality coal

Sh m dk brn,pity-sb plty,frm,mod calc,mod-v silty,less carb than above

Sltst m-dk gy,brn gy, sb blky,frm,sli-mod calc,sli carb w/ occ coaly lenses and lam, v arg in part

Ss m gy wh-crm,pred f gr,sb ang,fros,fair srt,smpl disagg,v calc cmt w/ wh non-v calc clyst,occ carb grs,NS

Sh m-dk brn,sb plty, frm,mod-v carb,occ coaly in part

Sh m-dk brn,sb plty, frm,mod-v carb,smpls coated w/ m brn,mod calc,v finely argill-dusty coating when dry possible drilling mud

Coal blk,sb blky text at top becoming v blky w/ conch frac at base, 25-50% vit in upper part-becoming 100% vit at base,sli-mod carb at top-non carb at base,v rr resin,occ pyr nodule,overall good coal-excellent at base,scattered v fine colored fibers-possible LCM from nearby well

Coal blk,sb blky-blky,20% vit micro-banded,sli-mod carb,tr pyr,some dark amber resin,fair quality coal

Sltst m-dk brn,gy brn sb plty-blky,frm,sli calc,sli-mod carb, coaly laminae & lenses

T/ P.C. Tongue 3117'

Ss m brn gy,gy wh S&P pred f gr,sb ang,fair srt,clr-sli fros,smpl disagg,mod calc,glauc & carb grs,mod abnt v finely dissem coaly frag,tr brn dd intgran residue,tr pale yel-gold flor,NC

Ss gen aa,sli less calc,no coaly frag, glauc & carb grs,NS

Coal blk,pred good blky text w/ conch frac,v blky at base,cu -90% vit-massive at base,v little carb material,some resin at top,best coal of well

T/ Main P.C. 3187'

TD Sample- drilled up 2% ft of P.C. Ss-m gy wh S&P,pred f-vf gr, sb ang-fair srt,glauc & carb grs,some coaly grs,tr brn dd intgran residue,NF,NC