

CROSS TIMBERS OPERATING COMPANY

Federal Gas Com 1 #1C

Drilling Prognosis

November 20, 2000

Location: 1,060' FSL & 660' FWL, Sec 20, T32N, R12W

County: San Juan

State: New Mexico

PROJECTED TOTAL DEPTH: ±5,025'

GR ELEV: 5,943'

OBJECTIVE: Mesaverde

Est KB ELEV: 5,955 (12' AGL)

1. MUD PROGRAM:

INTERVAL	0' to 160'	160' to 2,350'	2,350' to TD
HOLE SIZE	12-1/4"	8-3/4"	6-1/4"
MUD TYPE	FW/Spud Mud	FW/Polymer	Air/Mist
WEIGHT	8.6-9.0	8.4-8.8	N/A
VISCOSITY	28-32	28-32	N/A
WATER LOSS	NC	NC	N/A

Remarks: Use fibrous materials as needed to control seepage and lost circulation during intermediate part of hole.

2. CASING PROGRAM:

Surface Casing: 9-5/8" casing to be set at ± 160' in 8.6 ppg spud mud

Interval	Length	Wt	Gr	Cplg	Coll Rating (psi)	Burst Rating (psi)	Jt Str (M-lbs)	ID (in)	Drift (in)	SF Coll	SF Burst	SF Ten
0'-160'	160'	32.3#	H-40	STC	1,400	2,270	254	9.001	8.845	11.57	18.76	49.14

Intermediate Casing: 7" casing to be set at 2,350' in 8.8 ppg mud or polymer.

Interval	Length	Wt	Gr	Cplg	Coll Rating (psi)	Burst Rating (psi)	Jt Str (M-lbs)	ID (in)	Drift (in)	SF Coll	SF Burst	SF Ten
0'-2,350'	2,350'	20.0#	J-55	STC	2,270	3,740	234	6.456	6.331	1.48	2.44	4.97

Production Liner: 4-1/2" liner to be set from 2,150' to TD in Air/Mist.

Interval	Length	Wt	Gr	Cplg	Coll Rating (psi)	Burst Rating (psi)	Jt Str (M-lbs)	ID (in)	Drift (in)	SF Coll	SF Burst	SF Ten
2,150'-TD	2,875'	10.5#	J-55	STC	4,010	4,790	132	4.052	3.875	1.66	1.33	2.44

3. WELLHEAD:

- A. Casing Head: Larkin Fig 92 (or equivalent), 9-5/8" nominal, 2,000 psig WP (4,000 psig test) with 9-5/8" 8rnd thread on bottom and 11-3/4" 8rnd thread on top.
- B. Tubing Head: Larkin Fig 612 (or equivalent), 6.437" nominal, 2,000 psig WP (4,000 psig test), 7" 8rnd female thread on bottom and a flanged fitting on top.

4. CEMENT PROGRAM (Slurry design may change slightly, but the plan is to circulate cement to surface on both the surface and intermediate casing strings and to circulate cement above the liner hanger on the liner string):

- A. Surface: 9-5/8", 32.3#, H-40, STC casing to be set at $\pm 160'$.

Lead: 75 sx of Type III cement containing 2% CaCl_2 , 1/4 pps celloflake, mixed at 14.6 ppg, 1.39 ft^3/sk , & 6.30 gal wtr/sk.

Total slurry volume is 104 ft^3 , 100% excess of calculated annular volume to 160'.

- C. Intermediate: 7", 20.0#, J-55, STC casing to be set at $\pm 2,350'$.

Lead: 300 sx of Type III 65/35 poz with 8% gel, 1% CaCl_2 & 1/4 pps celloflake mixed at 12.1 ppg, 2.09 ft^3/sk , 14.63 gal wtr/sx.

Tail: 100 sx of Class "B" cement containing 1% CaCl_2 & 1/4 pps celloflake mixed at 14.6 ppg, 1.39 ft^3/sk , 6.30 gal wtr/sx..

Total slurry volume is 766 ft^3 , 100% excess of calculated annular volume to 2,350'.

- B. Production Liner: 4-1/2", 10.5#, J-55, STC liner to be set from 2,150'-TD (at $\pm 5,025'$).

Lead: 100 sx of Class "H" 50/50 poz w/4% gel, 1% CaCl_2 and 0.4% FL-52 mixed at 13.2 ppg, 1.45 ft^3/sk , 7.7 gal wtr/sx.

Tail: 200 sx of Class "H" 50/50 poz w/4% gel, 1% CaCl_2 , 0.4% FL-52, 1/4 pps celloflake & 4% Phenoseal mixed at 13.2 ppg, 1.45 ft^3/sk , 7.7 gal wtr/sx..

Total estimated slurry volume for the 4-1/2" production liner is 435 ft^3 using 50% excess.

Note: The slurry design may change slightly based upon actual conditions. Final cement volumes will be determined for the caliper logs plus 50%. It will be attempted to circ cement to top of liner hanger.

5. LOGGING PROGRAM:

- A. Mud Logger: There are no plans to use a mud logger at this time.
- B. Open Hole Logs as follows: Run Induction/SFL/GR/SP/density/Cal and Pe fr/TD to the bottom of the intermediate csg. Use logging tools for air drilled hole.

6. **FORMATION TOPS:**

Formation	Subsea Depth	Well Depth
Ojo Alamo SS	+4915'	1040'
Kirtland Shale	+4790'	1165'
Fruitland Formation	+4388'	1567'
Lower Fruitland Coal	+3959'	1996'
Pictured Cliffs SS	+3920'	2035'
Lewis Shale	+2732'	3223'
Cliffhouse SS*	+2208'	3747'
Menefee*	+1938'	4017'
Point Lookout SS*	+1421'	4534'
Mancos Shale	+1137'	4818'
Projected TD	+930'	5025'

* Target Reservoir. Maximum anticipated reservoir pressure will be $\pm 1,550$ psig.

7. **COMPANY PERSONNEL:**

Name	Title	Office Phone	Home Phone
Jeff Patton	Drilling Engineer	505-324-1090	505-632-7882
Bobby Smith	Drilling Manager	915-682-8873	915-689-8839
Randy Hosey	Project Geologist	817-885-2398	817-427-2475
Barry Voigt	Reservoir Engineer	817-885-2462	817-540-2092

JWP
11/20/00