

## DRILLING PROGRAM

Attached to Form 3160-3  
Mitchell Energy Corporation  
Apache "25" Federal No. 1  
1730' FNL & 660' FEL  
SE/NE, Sec. 25, T22S, R30E  
Eddy Co., New Mexico

### 1. Geologic Name of Surface Formation:

Permian

### 2. Estimated Tops of Important Geologic Markers:

Permian	surface	Wolfcamp	11200'
Top Salt	615'	Strawn	12530'
Base Salt	3580'	Atoka	12805'
Delaware	3850'	Morrow	12980'
Brushy Canyon	5900'	Total Depth	14600'
Bone Spring	7625'		

### 3. Estimated Depths of Anticipated Fresh Water, Oil or Gas:

Upper Permian Sands to 100'	fresh water
Delaware 3850'	oil
Brushy Canyon 5900'	oil
Strawn 12530'	gas/cond
Atoka "AC" 12880'	gas
Atoka Bank 12950'	gas
Morrow "B" SS 13680'	gas

No other formations are expected to give up oil, gas, or fresh water in measurable quantities. The surface fresh water sands will be protected by setting 13-3/8" casing at 550' and circulating cement back to surface. Any zones above TD which contain commercial quantities of oil and/or gas will have cement circulated across them behind the 9 5/8" or 7" intermediate casing or the 4-1/2" liner which will be cemented on bottom.

### 4. Casing Program:

<u>Hole Size</u>	<u>Interval</u>	<u>OD Casing</u>	<u>Weight, Grade, Jt. Cond. Type</u>
26"	0-40'	20"	Conductor, 0.3" wall thickness
17-1/2"	Surf-550'	13-3/8"	54.5#, K-55, ST&C, New, R-3
12-1/4"	Surf-3800'	9-5/8"	40#, K-55, LT&C, New, R-3
8-3/4"	Surf-12300'	7"	26 <del>&amp; 28</del> #, S-95 & P110, LT&C, New, R-3
6"	12000'-TD	4-1/2"	13.5#, S-95, LT&C, New, R-3

Cement Program:

13-3/8" surface casing  
@ 550':

Cemented to surface with 500 sacks of Class "C" + 4% gel + 2%  $\text{CaCl}_2$  and 250 sx Class "C" + 2%  $\text{CaCl}_2$ .

9-5/8" intermediate casing  
@ 3800':

Cemented to surface with 2100 sacks Halliburton Lite + 15#/sx salt + 1/4#/sx Flocele and 300 sx Class "C" + 2%  $\text{CaCl}_2$ .

7" intermediate casing  
@ 12300':

Cemented with 800 sacks Lite + 300 sx Class "H" + 5#/sx salt. TOC @ 3500'. Shallow productive zones if present will be cemented by placing a cementing stage tool below the zone of interest and cementing with Class "C" cement.

4-1/2" liner @ TD:

Cemented with 425 sacks Class H + 4% TF-4 + 0.6% CF-9 + 0.6% Flo-LOK-1 + 5#/sx KCl. Cemented to TOL.

5. Minimum Specifications for Pressure Control:

The blowout preventer equipment (BOP) shown in Exhibit #1 will consist of a double ram-type (10,000 psi WP) preventer and a bag-type (hydril) preventer (5000 psi WP). Both units will be hydraulically operated and the ram-type preventer will be equipped with blind rams on top and 4-1/2" drill pipe rams on bottom. Both BOP's will be nipped up on the 13-3/8" surface casing and used continuously until TD is reached. All BOP's and accessory equipment will be tested to 1000 psi before drilling out of surface casing. Before drilling out of 9-5/8" intermediate casing, the ram-type BOP and accessory equipment will be tested to 10,000 psi and the hydril to 70% of rated working pressure (3500 psi).

The testing procedure will be duplicated before drilling out of 7" intermediate casing and after any use under pressure during the drilling of the well.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. A 2" kill line and 3" choke line will be included in the drilling spool located below the ram-type BOP. Other accessories to the BOP equipment will include a kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold with 10,000 psi WP rating.

6. Types and Characteristics of the Proposed Mud System:

The well will be drilled to TD with a combination brine, cut brine, and polymer/KCl mud system. The applicable depths and properties of this system are as follows:

<u>Depth</u>	<u>Type</u>	<u>Weight (ppg)</u>	<u>Viscosity (sec)</u>	<u>Waterloss (cc)</u>
0- 550'	Freshwater (spud)	8.5	40-45	N.C.
550- 7600'	Brine Water	10.0	30	N.C.
7600-10500'	Cut Brine	8.8-9.2	30	N.C.
10500-12300'	Cut Brine/Polymer	9.2-9.5	32-34	40
12300-12950'	Brine/Polymer	10.5-12.0	34-38	5
12950-TD	Brine/Polymer/KCl	10.5-12.0	40-42	5

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept at the wellsite at all times. The 7" casing shoe will be tested to an EMW equal to the maximum expected mud weight required for drilling the Atoka formation.

7. Auxiliary Well Control and Monitoring Equipment:

- A. A kelly cock will be kept in the drill string at all times.
- B. A full opening drill pipe stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- C. An electronic pit-volume-totalizer system will be used continuously below 10,000' to monitor the mud and pump system. The drilling fluids system will also be visually monitored at all times.
- D. A mud logging unit complete with H<sub>2</sub>S detector will be continuously monitoring drilling penetration rate and hydrocarbon shows from 3800' to TD.
- E. A rotating head, mud-gas separator and vacuum degasser will be operational at all times below 10,000' to facilitate handling a gas kick or gas cutting of the mud until the mud weight can be increased.
- F. Drill pipe protectors will be used at all times while drilling inside the 7" casing, which will eventually become the production casing above the 4-1/2" liner top.

8. Logging, Testing and Coring Program:

- A. Drillstem tests will be run on the basis of drilling shows. At least two tests are anticipated.
- B. The electric logging program will consist of GR-Dual Laterolog-MSFL and GR-Sonic from TD to intermediate casing at 3800' and GR-Compensated Neutron-Density from TD to surface. Selected SW cores will be taken in zones of interest.
- C. No conventional coring is anticipated.
- D. Further testing procedures will be determined after the 4-1/2" production liner has been cemented at TD based on drill shows, log evaluation and drill stem test results.

9. Abnormal Conditions, Pressures, Temperatures, & Potential Hazards:

No abnormal pressures or temperatures are anticipated. The estimated bottom-hole temperature (BHT) at TD is 180°F and estimated bottom-hole pressure (BHP) is 7000 psig. No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. No major loss circulation zones have been reported in offsetting wells.

10. Anticipated Starting Date and Duration of Operations:

Road and location work will not begin until approval has been received from the BLM. The anticipated spud date is April 1, 1993. Once commenced, the drilling operation should be finished in approximately 60 days. If the well is productive, an additional 30 days will be required for completion and testing before a decision is made to install permanent facilities.