

4. Casing and Cementing Program

<u>Hole Size</u>	<u>Casing</u>		<u>Casing OD</u>	<u>Weight, Grade, Coupling, Cond,</u>
	<u>From</u>	<u>To</u>		
17-1/2"	0'	500'	13-3/8"	48 # H-40 STC
12-1/4"	0'	3,100'	9-5/8"	40 # N-80 LTC
8-1/2"	0	11,200'	7"	26, 29# P-110 & N-80 LTC
6-1/8"	10,900'	14,250'	5" Liner	18 # N-80

All used casing will be drifted and hydrostatically tested to at least 90% of new pipe rating.

Minimum Design Factors: Collapse 1.125, Burst 1.1, Tension 1.7

13-3/8" surface casing set at 500'

The surface casing will be set into the Rustler anhydrite to protect all fresh water formations.

Centralize the bottom 3 joints and every 4th joint to surface.

Cement to surface with 400 sx of Class C with 4% gel, 2% CaCl<sub>2</sub> (13.5 ppg, 1.74 ft<sup>3</sup>/sx) followed by 200 sx Class C with 2% CaCl<sub>2</sub> (14.8 ppg, 1.32 ft<sup>3</sup>/sx).

9-5/8" intermediate casing set at 3100'

The intermediate casing will be set within 100' of the top of the Delaware to isolate all salt stringers.

Centralize the bottom 3 joints.

Cement to surface with 700 sx of 35/65 Pozmix Class H with 6% gel, 5% salt, 1/4# FC (12.8 ppg, 1.94 ft<sup>3</sup>/sx) followed by 550 sx Class C with 1% CaCl<sub>2</sub> (15.6 ppg, 1.19 ft<sup>3</sup>/sx).

7" production casing set at 11,200'

Centralize every joint from TD to bottom of the intermediate casing. Top of cement to be at 2500'.

A 2-stage cement job will be required with a DV tool at +9000'.

Stage 1: 1200sx 50/50 Pozmix Class H with 2% gel, 5% salt, 1/4# FC (14.2 ppg, 1.34 ft<sup>3</sup>/sx).

Stage 2: 800 sx 50/50 Pozmix Class H with 2% gel, 5% salt, 1/4# FC (14.2 ppg, 1.34 ft<sup>3</sup>/sx).

5" Liner set at 14,250'

Cemented with 250 sx cement. Top of liner to be at 10,900'