

**Robert L. Bayless, Producer LLC****WEAVER RIDGE #13-9H**

SHL: 2075' FSL & 879' FEL (NESE) Section 13, T1S R104W  
 BHL: 550' FNL & 660' FWL (NWNW) Section 24, T1S R104W  
 Rio Blanco County, Colorado

**SURFACE CASING AND CENTRALIZER DESIGN**

Proposed Total Depth:	4,870 ft	Proposed Depth of Surface Casing:	500 ft
Estimated Pressure Gradient:	0.42 psi/ft		
Bottom Hole Pressure at 4,870 ft		Hydrostatic Head of gas/oil mud:	0.22 psi/ft
0.42 psi/ft x 4,870 ft =	2,045 psi	0.22 psi/ft x 4,870 ft =	1071 psi

**Maximum Design Surface Pressure**

Bottom Hole Pressure	–	Hydrostatic Head	=	
(0.42 psi/ft x 4,870 ft)	–	(0.22 psi/ft x 4,870 ft)	=	
2,045 psi	–	1071 psi	=	974 psi

<b><u>Casing Strengths</u></b>	9-5/8" J-55 36.0 #/ft ST&C		
<u>Wt (#/ft)</u>	<u>Tension (lbs)</u>	<u>Burst (psi)</u>	<u>Collapse (psi)</u>
36.0	394,000	3,520	2,020

**Safety Factors**

Minimum Standards:	Tension (Dry): 1.8	Burst: 1.0	Collapse: 1.125
Tension (Dry): Casing Weight:	36.0 #/ft x 500 ft	=	18,000 lbs
Safety Factor:	394,000 lbs / 18,000 lbs	=	<b><u>21.89</u> OK</b>
Burst:	Safety Factor: 3,520 psi / 974 psi	=	<b><u>3.61</u> OK</b>
Collapse:	Hydrostatic: 0.052 x 9.0 ppg x 500 ft	=	234 psi
Safety Factor:	2,020 psi / 234 psi	=	<b><u>8.63</u> OK</b>

Use: 500 ft of 9 5/8" J-55 36.0 #/ft ST&C casing

Use: 3M BOPE and casinghead

<b><u>Centralizers</u></b>	Use 6 total
	1 middle of bottom joint
	1 top of second joint
	1 top of third joint
	1 every other joint (±80 ft)
Total centralized	± 420 ft

Note that field experience indicates that additional centralizers greatly increase the chance of "sticking" the surface casing prior to reaching surface casing total depth.