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SEP -4 01

COGCC

**CLX ENERGY, INC.**  
**Blue Gravel 3-23**  
**660' FSL & 1,980' FWL (SE/4 SW/4)**  
**Sec. 23, T9N-R91W**  
**Moffat County, Colorado**  
**Federal Lease #C-17366**

**DRILLING PROGRAM**



Note: Proposed drillsite spacing - 160 acres to consist of SW/4 Sec. 23, per Colorado Oil & Gas Commission Order No. 318 (Statewide Spacing)

**SURFACE FORMATION:**

Wasatch - Fresh water possible above 200'

**ESTIMATED FORMATION TOPS -**

(Water, oil, gas and/or other mineral-bearing formations)

Ft. Union	1,770'	Shales & siltstones, some water, oil and/or gas bearing
Lance	2,270'	Sandstone, shales & siltstones, some water bearing
Lewis Shale	3,650'	Shale
Lower Lewis Sand	4,140'	Shales & sandstones
Marine Shale	4,250'	Shales & siltstones

**TOTAL DEPTH**      4,300'

**CASING PROGRAM**

Depth	Hole Dia.	Csg. Dia.	Csg. Wt. & Grade	Cement
0-500'	12-1/4"	8-5/8"	J-55 32# STC	To surf. w/±200 sxs. "G"
0-T.D.	7-7/8"	4-1/2"	N-80 11.6 LTC	TD to ±2,600' w/+300 sxs. "G"

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COGCCPRESSURE CONTROL (See attached schematic diagram)

BOP's and choke manifold will be installed and pressure tested before drilling out under surface casing (subsequent pressure test will be performed whenever pressure seals are broken), and then will be checked daily as to mechanical operating condition. BOP's will be pressure tested at least once every 30 days. Ram type preventors and related pressure control equipment will be pressure tested to rated working pressure of the stack assembly if a test plug is used. If a plug is not used, the stack assembly will be tested to the rated working pressure of the stack assembly or to 70% of the minimum internal yield of the casing, whichever is less. Annular type preventors will be pressure tested to 50% of their rated working pressure. All casing strings will be pressure tested to 0.22 psi/ft. or 1500 psi, whichever is greater, not to exceed 70% of internal yield.

MUD PROGRAM

0' - 500' Spud mud  
500' - T.D. Low solids non-dispersed  
MW 9.1 - 11.2 ppg, Vis. 38-42 sec.  
WL 15cc or less, pH 8.5 - 9.0

Sufficient mud materials to maintain mud properties, control lost circulation and to contain "kick" will be available at wellsite.

AUXILIARY EQUIPMENT

- A) Upper kelly cock (lower kelly cock - to be available on rig floor)
- B) Inside BOP or stab-in valve (available on rig floor)
- C) Mud monitoring will be visually observed

LOGGING/CORING/TESTING PROGRAM

- A) Logging: DIL-SFL-GR - TD - BSC (Gr. To surface)  
CNL-FDC-GR - over selected intervals
- B) Coring: None
- C) Testing: Possible DST - Lower Lewis  
Drill stem tests may be run on shows of interest

ABNORMAL CONDITIONS

- A) Pressures: No abnormal conditions are anticipated  
Almond pressure gradient - 0.41 psi/ft.
- B) Temperatures: No abnormal conditions are anticipated
- C) H2S: None anticipated
- D) Estimated BHP: 1,935 psi

ANTICIPATED START DATE

November 15, 2001

COMPLETION

The location pad will be of sufficient size to accommodate all completion activities and equipment. A Sundry Notice will be submitted with a revised completion program if warranted.

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**PRODUCTION CASING & CENTRALIZER DESIGN****CLX ENERGY, INC.****Blue Gravel 3-23****660' FSL & 1,980' FWL (SE/4 SW/4)****Sec. 23, T9N-R91W****Moffat County, Colorado****Federal Lease #C-17366**

Proposed Total Depth – 4,300'

Proposed Depth – Production Casing – 4,300'

Estimated Pressure Gradient – 0.45 psi/ft.

Bottom Hole Pressure at 4,300'

 $0.45 \text{ psi/ft.} \times 4,300' = 1,935 \text{ psi}$ 

Hydrostatic head – gas/oil cut mud – 0.22 psi/ft.

 $0.22 \text{ psi/ft.} \times 4,300' = 946 \text{ psi}$ Maximum Design Surface Pressure

Bottom Hole Pressure – hydrostatic head

$$(0.45 \text{ psi/ft.} \times 4,300') - (0.22 \text{ psi/ft.} \times 4,300') =$$

$$1,935 \text{ psi} - 946 \text{ psi} = 989 \text{ psi}$$
Casing Strengths – 4-1/2" 11.6# N-80 LTC

<u>Wt.</u>	<u>Tension(lbs.)</u>	<u>Burst(psi)</u>	<u>Collapse(psi)</u>
11.6#	267,000	7,780	6,350

Safety Factors

Tension (Dry) – 1.8    Burst – 1.125    Collapse – 1.125

Tension (Dry) –  $11.6\#/ft. \times 4,300' = 49,880\#$ 

$$\text{S.F.} = \frac{267,000}{49,880} = 5.35$$
Burst -
$$\text{S.F.} = \frac{7,780 \text{ psi}}{1,935 \text{ psi}} = 4.02$$
Collapse -
$$\text{Hydrostatic} = 0.052 (9.2 \text{ ppg}) 4,300' = 2,057 \text{ psi}$$

$$\text{S.F.} = \frac{6,350 \text{ psi}}{2,057 \text{ psi}} = 3.09$$

- Use 4,300' 4-1/2" 11.6# N-80 LTC, or better
- Use 3,000 psi w.p BOP stack

Centralizers – 3 Total3 – One on the shoe joint and then every other joint,  $\pm 80'$ 

Based on previous experience, additional centralizers substantially increase the risk of the casing sticking prior to reaching bottom.



**SURFACE CASING & CENTRALIZER DESIGN**  
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Proposed Total Depth – 4,300'  
Proposed Depth – Surface Casing – 500'  
Estimated Pressure Gradient – 0.45 psi/ft.  
Bottom Hole Pressure at 4,300'  
 $0.45 \text{ psi/ft.} \times 4,300' = 1,935 \text{ psi}$

Hydrostatic head – gas/oil cut mud – 0.22 psi/ft.  
 $0.22 \text{ psi/ft.} \times 4,300' = 946 \text{ psi}$

Maximum Design Surface Pressure

Bottom Hole Pressure – hydrostatic head  
 $(0.45 \text{ psi/ft.} \times 4,300') - (0.22 \text{ psi/ft.} \times 4,300') =$   
 $1,935 \text{ psi} - 946 \text{ psi} = 989 \text{ psi}$

Casing Strengths – 4-1/2" 11.6# N-80 LTC

<u>Wt.</u>	<u>Tension(lbs.)</u>	<u>Burst(psi)</u>	<u>Collapse(psi)</u>
32#	372,000	3,930	2,530

Safety Factors

Tension (Dry) – 1.8      Burst – 1.125      Collapse – 1.125

Tension (Dry) –  $32\#/ft. \times 500' = 16,000\#$   
S.F. =  $\frac{372,000}{16,000} = 23.3$

Burst - S.F. =  $\frac{3,930 \text{ psi}}{989 \text{ psi}} = 3.97$

Collapse – Hydrostatic =  $0.052 (9.2 \text{ ppg}) 500' = 2.39 \text{ psi}$   
S.F. =  $\frac{2,530 \text{ psi}}{239 \text{ psi}} = 10.59$

- Use 500' 8-5/8" J-55 32#/ft. STC or LTC, or better
- Use 3,000 psi w.p BOP stack

Centralizers – 4 Total

- 1 – near surface @ 80'
- 1 – middle of bottom joint
- 2 – every other joint,  $\pm 80'$

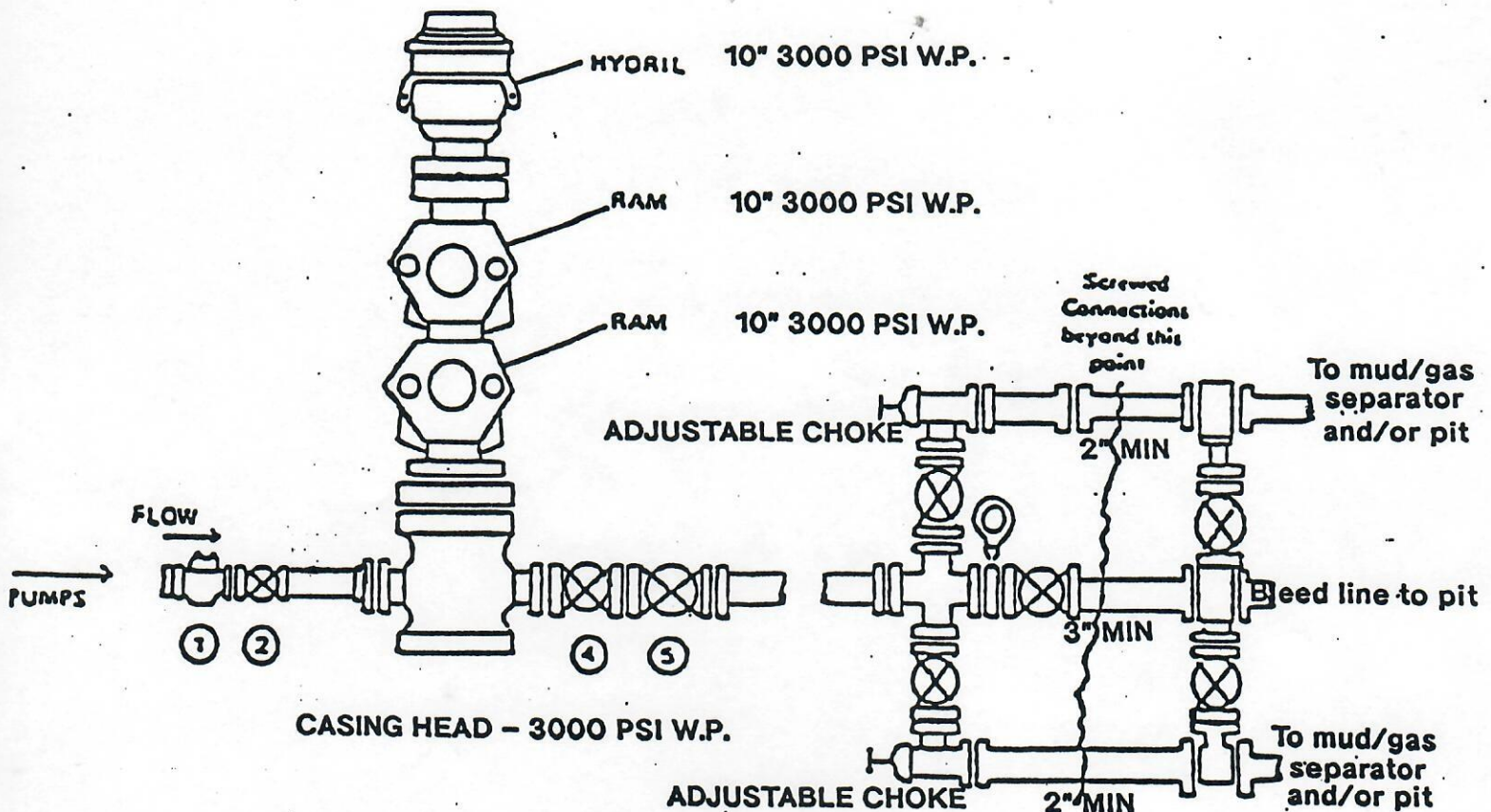
Based on previous experience, additional centralizers substantially increase the risk of the casing sticking prior to reaching bottom.

# MINIMUM BOP Requirements

3000 PSI W.P.

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FILL LINE ABOVE THE UPPERMOST PREVENTER



## KILL LINE

Valve #1 - Flanged check valve  
Full working pressure  
of BOP

Valve #2 - Flanged, minimum 2"  
bore  
Full working pressure  
of BOP

## CHOKE LINE

Valves #4 & 5 - Flanged minimum 3"  
bore,  
Full working pressure  
of BOP  
(Note: An HCR can  
be used instead of  
Valve # 5)

## GENERAL RULES AND RECOMMENDATIONS

All lines to manifold are to be at right angles (90 deg.). No 45 deg. angles are to be used.

Blind flanges are to be used for blanking.

ALL studs and nuts are to be installed on all flanges.

Choke manifold may be screwed connections behind choke.