

NINE POINT DRILLING PLAN

Fee 162Y

Rangely Weber Sand Unit

Vertical Well

Surface: 566' FNL & 1443' FEL, Section 28, T2N, R102W
Latitude 40.119750 & Longitude 108.844017 NAD 83

Bottomhole: 566' FNL & 1443' FEL, Section 28, T2N, R102W
Latitude 40.119750 & Longitude 108.844017 NAD 83

Rio Blanco County, CO

a. NAMES & ESTIMATED TOPS OF GEOLOGIC GROUPS:

Name	Estimated Tops
Mancos group	Surface

b. NAMES, ESTIMATED TOPS & THICKNESS OF FORMATIONS:
(based upon est. surface elev. of 5,320')

Name	Estimated Tops	Thickness
Mancos	Surface	2,976'
Frontier	2,976' TVD/MD	361'
Dakota	3,337' TVD/MD	93'
Morrison	3,430' TVD/MD	604'
Curtis	4,034' TVD/MD	178'
Entrada	4,212' TVD/MD	150'
Carmel	4,362' TVD/MD	54'
Navajo	4,416' TVD/MD	585'
Chinle	5,001' TVD/MD	136'
Shinarump	5,137' TVD/MD	88'
Moenkopi	5,225' TVD/MD	656'
Weber	5,881' TVD/MD	919'
TD	6,800' TVD/MD	

c. PRESSURE CONTROL EQUIPMENT:

For drilling surface hole to 2000':

No BOP equipment required.

For drilling through 9 5/8" surface casing to TD:

Maximum anticipated surface pressure is <3000 psi.

Pressure control equipment shall be in accordance with BLM minimum standards.

A casing head with an 11", 5000 psi flange will be welded onto the 9 5/8" surface casing.

BOP stack will consist of either 2 single gate or a double gate and annular preventer. The gate preventers will be equipped with pipe rams on bottom and blind rams on top. The choke and kill lines will be connected to outlets below the top rams, utilizing either the ram body outlet or a drilling spool with side outlets. Co-flex hose will be utilized from the BOP to the choke manifold. The BOP stack will be 11" or 13.625" bore, 3000 psi working pressure or greater. The choke and kill lines will be 3" bore, 3000 psi working pressure or greater. Please refer to attached schematic.

Test procedure and frequency shall be in accordance with BLM minimum standards for 3000 psi equipment, per BLM Oil & Gas Order #2.

d. **PROPOSED CASING PROGRAM, DRILLED HOLE SIZE:**

Casing Information: All casing will be new pipe and tested to 1500 psi.

Casing	Weight	Grade	Conn.	Stage	Centralizers
9 5/8"	36.0#/ft	K-55	LTC	No	*
7"	23.0#/ft	L-80	LTC	No	As Needed
5 1/2"	17.0#/ft	L-80	LTC**	No	As Needed

*At a minimum, centralizers will be placed on the bottom three joints and every fourth joint thereafter.

**LTC collars turned down.

Casing Design Information (9 5/8" casing @ 2000'):

Collapse value for new pipe: 2020 psi Actual Load: 988 psi S.F.: 2.0

Burst value for new pipe: 3520 psi Actual Load: 633 psi* S.F.: 5.4

Tension value for new pipe: 423,000# Actual Load: 172,000#** S.F.: 2.5

*Surface casing burst load based on a formation fracture gradient of 1.0 psi/ft.

**Tension load calculated with 100,000 lbs overpull.

(7" casing @ top of Weber at 5881' TVD):

Collapse value for new pipe: 3830 psi Actual Load: 3005 psi S.F.: 1.3

Burst value for new pipe: 6340 psi Actual Load: 3527 psi S.F.: 1.8

Tension value for new pipe: 435,000# Actual Load: 235,263#* S.F.: 1.8

*Tension load calculated with 100,000 lbs overpull.

(5 1/2" liner – top of liner 5581' TVD, bottom of liner 6800' TVD):

Collapse value for new pipe: 6280 psi Actual Load: 3536 psi S.F.: 1.8

Burst value for new pipe: 7740 psi Actual Load: 3669 psi S.F.: 1.7

Tension value for new pipe: 338,000# Actual Load: 115,700#* S.F.: 2.9

*Tension load calculated with 100,000 lbs overpull. Liner run on 2-7/8" DP.

Surface Hole (0'-2000')

The surface hole will be drilled using a conventional rotary drilling rig. A 12 1/4" hole will be drilled utilizing fresh water mud.

Intermediate Hole (2000' - 5881' TVD)

Drilling below surface casing will be with conventional rotary equipment utilizing fresh water mud. Hole size will be 8 3/4".

Production Hole (6800' TVD - TD)

The Weber Payzone will be drilled utilizing NaCl brine. Hole size will be 6 1/8".

e. AMOUNT AND TYPES OF CEMENT TO BE USED SETTING CASING STRING:

Casing	Cement
9 5/8"	Two slurry system with oilfield type cement circulated in place. Lead: 35:65 Poz: Class "G" cement mixed at 12.3 ppg with an yield of 2.26 cf/sx. Theoretical volume of lead cement is 425 sacks including 100% excess in the open hole. Tail: 35:65 Poz: Class "G" cement mixed at 12.8 ppg with an yield of 2.01 cf/sx. Theoretical volume of tail cement is 180 sacks. Volumes based on calculated plus 100% excess. Top wiper plug will be used. Allowed to set under pressure. Theoretical open hole annular volume is 678 cu ft.
7"	Two slurry system with oilfield "light weight" cement with additives ahead of oilfield premium cement with additives circulated in place.

Lead: Tuned Light cement mixed at 11.3 ppg with a yield of 2.00 cf/sx. Theoretical volume of lead cement is 340 sacks including 50% excess in the open hole. Tail: Tuned Light mixed at 13.0 ppg with a yield of 1.41 cf/sx. Theoretical volume of tail cement is 380 sacks including 50% excess in the open hole. If cement does not reach the surface in cementing the production string, a bond log will be run to determine the top of cement (TOC) to ensure isolation between the Frontier formation and the surface casing shoe.

5 1/2" One slurry system of oilfield premium cement with additives circulated in place. Tail: BondCem system mixed at 13.5 ppg with a yield of 1.40 cf/sx. Theoretical volume of tail cement is 75 sacks including 15% excess in the open hole and 200' above the liner top (DP x 7" casing annulus).

f. TYPES AND CHARACTERISTICS OF PROPOSED CIRCULATING MEDIUM:

The well will be drilled using a closed loop system. There will be no reserve pit. Fluid levels in pits will be monitored using a Pit Volume Totalizer provided by a service company. Water based drilling fluid will be de-watered and cuttings will be put into a cuttings pit. The cuttings pit will be in compliance with COGCC's COA-38 which states:

- The moisture content of any drill cuttings in a cuttings pit, trench, or pile shall be as low as practicable to prevent accumulation of liquids greater than de minimis amounts. At the time of closure, the drill cuttings must also meet the applicable standards of table 910-1.

The following COGCC COA's will also be met:

COA 5 - Operator must implement best management practices to contain any unintentional release of fluids.

COA 9 - If fluids are conveyed via pipeline, operator must implement best management practices to contain any unintentional release of fluids.

COA 23 - Operator must ensure 110 percent secondary containment for any volume of fluids contained at well site during drilling and completion operations; including, but not limited to, construction of a berm or diversion dike, diversion/collection trenches within and/or outside of berms/dikes, site grading, or other comparable measures (i.e., BMPs associated with stormwater management) sufficiently protective of the nearby surface water.

COA 39 - No portion of any pit that will be used to hold liquids shall be constructed on fill material, unless the pit and fill slope are designed and certified by a professional engineer, subject to review and approval by the director prior to construction of the pit. The construction and lining of the pit shall be supervised by a professional engineer or their agent. The entire base of the pit must be in cut.

Surface Hole (0'-2000')

A conventional rotary rig will be used to drill the surface hole. Water based drilling fluids consisting primarily of fresh water, bentonite, lignite, caustic, lime, soda ash, and polymers will be used. No chromate's will be used. It is not intended to use oil in the mud, however, in the event it is used, oil concentration will be less than 4% by volume. Maximum anticipated mud weight is ± 9.0 ppg.

A minimum quantity of weighting material will be kept on location

Intermediate Hole (2000'-5881' TVD')

Drilling below surface casing will be with water based drilling fluids consisting primarily of fresh water, bentonite, lignite, caustic, lime, soda ash, and polymers. No chromate's will be used. It is not intended to use oil in the mud, however, in the event it is used, oil concentration will be less than 4% by volume. Maximum anticipated mud weight is ± 10.0 ppg.

A minimum quantity of weighting material will be kept on location.

H2S and CO2 detector will be used at all times during drilling operation.

Production Hole (6800' TVD-TD)

The Weber Payzone will be drilled utilizing NaCl brine.

g. TESTING, LOGGING AND CORING PROCEDURES:

Logging:

Electric Logging: Cased Hole logs / gamma ray and porosity
Open Hole logs (possible)

Coring: None planned.

Testing: None planned.

h. EXPECTED BOTTOM HOLE PRESSURES, ABNORMAL PRESSURES, TEMPERATURES OR POTENTIAL HAZARDS:

Normal pressure gradient to top of Weber. Offset pressure history indicates that the pressure gradient in the Weber should be between a minimum of 0.32 psi/ft to a maximum of 0.50 psi/ft.

Maximum expected BHP @ TD: ~ 3000 psi

Maximum expected BHT @ TD: ~ 160° F

Hydrogen Sulfide:

Hydrogen sulfide (H2S) gas exists in the Weber Formation within the Rangely Field. Concentrations vary across the Field (± 100 -700 ppm) due to a long history of production in conjunction with water and CO2 injection.

Chevron's "**H2S Contingency Plan**" will be adhered to minimize any potential hazard.

Possible Aquifers: None

Oil: Probable in Weber @ 5881'-6800' TVD

Gas: Probable minor gas in Weber @ 5881' TVD decreasing to 6800' TD.

Protection of oil, gas, water, or other mineral bearing formations:

Protection shall be accomplished by cementing surface casing back to the surface. Production casing will be cemented with a sufficient cement volume to attempt to bring cement back to surface. If cement does not reach the surface in cementing the production string, a bond log will be run to determine the top of cement (TOC) to ensure isolation between the Frontier formation and the surface casing shoe.

i. **OTHER INFORMATION:**

Auxiliary Equipment

Conventional Rotary Drilling Rig

PVT-Flowmeter

Desilter

Desander

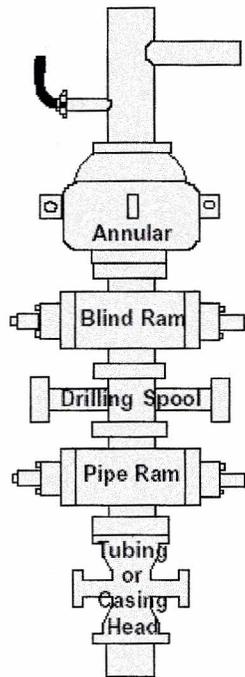
Full Opening Safety Valve

Upper Kelly Valve

Lower Kelly Valve

BOP Schematic

Class III BOP Stack



Class III Choke Manifold

