

GEOLOGIC & DRILLING PROGNOSIS

Prepared: 30-Dec-25 CMW

WELL NAME: FEDERAL RGU 41-7-297
Directional from the pad RGU 23-6-297

API: 05-103-12645
STATE: CO
COUNTY: RIO BLANCO
SURFACE HOLE LOCATION: Sec. 6 T 2S R 97W
TYPE OF UNIT: FED
FEDERAL EA: Yes
HARDLINE: No

ELEVATION (ft):
PAD (ft): 6222
GROUND (ft): 6222
KELLY BUSHING (ft): 6252

RIG INFORMATION:
RIG NAME: HP 522
KB HEIGHT (ft): 30

ESTIMATE TOPS:

Formation	TVD	MD	Formation Resource Notes
Uinta	30	30	Potentially Useable Water
Green River	650	654	Potentially Useable Water
A Groove	800	809	Potentially Useable Water
B Groove	1000	1018	Potentially Useable Water
Dissolution Surface	1300	1343	Possible Lost Circ Zone
Garden Gulch	2200	2371	Potentially Useable Water
Orange Marker	2181	2555	Potentially Useable Water
Upper Wasatch	2440	2646	Potentially Useable Water
Top of "G" Sand	5050	5636	Possible Lost Circ Zone
Fort Union	5310	5934	Gas and Limited Use and Quality Water
Lower Wasatch	6100	6838	Potentially Useable Water
Ohio Creek	6902	7699	Possible Lost Circ Zone
Upper Measaverde	7622	8429	Gas and Limited Use and Quality Water
Approx. Top Gas	8422	9230	Gas and Limited Use and Quality Water
Cameo Coals	9992	10800	Gas, Coal, and Limited Use and Quality Water
Rollins SS	10722	11530	Gas and Limited Use and Quality Water
Cozzette	10872	11680	Gas and Limited Use and Quality Water
Corcoran	11197	12005	Gas and Limited Use and Quality Water
Upper Segro	11457	12265	Gas and Limited Use and Quality Water
Lower Segro	11702	12510	Gas and Limited Use and Quality Water
TD	12202	13010	

MUD LOGGING: Type: (Optional) Remote Gas Unit
Interval: Base of surface casing to TD with total gas only

OPEN HOLE LOGS: Specifics: (Optional) Triple-Combo (DIL-GR-SP-Neutron Density)
Interval: (Optional) GR from TD to surface, DIL-SP and Neutron Density from TD to 100' inside surface casing

CASED HOLE LOGS: Cement Eval: CBL

CSG & CEMENT PROGRAM: SHOE TEST REQUIRED

	Csg Size (in)	Depth Set (tvd)	Depth Set (md)	Hole Size (in)	Approx. Cmt Tail (ft3)	Tail Yield (ft3/sx)	Approx. Sx Tail	Approx. Cmt Lead (ft3)	Lead Yield (ft3/sx)	Approx. Sx Lead	WOC (hrs)
Conductor:	20	80	80	30	230	1.15					
Surface:	9.625	2540	2761	12.25	188	1.68	112	921	2.53	364	
Liner or Production:	4.5	12202	13010	8.75	1683	1.88	895	1029	2.09	493	
							Surface (sacks):	476	Prod. (sacks):	1388	

ANTICIPATED PRESSURES (psi)

MASP	Prod Csg Test Pressure	Anticipated BHP	Prod. Csg. Grade
3,661	8,500	5,674	HCP-110

MUD PROGRAM: (Do not deviate from mud engineer's recommendation without prior consent from Parachute office)

FROM (md)	TO (md)	TYPE MUD	#/GAL	VIS	WL	CHEMICALS
0	2761	WBM	8.3-9.5	45-50	7-15	Bentonite/PHPA
2761	13010	LSND	8.6-10.0	40-80	6-10	PHPA/Barite

(Write mud added to system on tour sheets and report all mud mixed and daily cost in morning report)

LOST CIRCULATION: Report depth and bbls of mud lost on morning report and tour sheet. Any severe lost circulation problems should be reported immediately to well supervisor.

SURVEYS: Run every 100' on surface hole and trips unless otherwise instructed.

TEP GEOLOGIST: Office: 281-936-0361 Cell: 303-918-4327
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(note: if there are questions concerning TD or logging, please call Geologist)

CASING & CEMENTING PLAN

Operator: TEP Rocky Mountain
 Well Name & Number: FEDERAL RGU 41-7-297
 Location: Ryan Gulch

Casing Design Calculations											
Type of Casing	Size of Hole (inches)	Size of Casing (inches)	Weight per Foot (lbs/ft)	Grade	Thread	Interval (ft - ft)	Length (feet)	Setting Depth (TVD feet)	Collapse (psi)	Burst (psi)	Tension (lbs)
Surface	12.25	9.625	36.0	J-55	BTC	0-2761	2,761	2,540	2,020	3,520	453,000
Production	8.75	4.500	11.6	HCP-110	GB (BTC)	0-13010	13,010	12,202	8,650	10,690	367,000

Surface Casing Shoe	Production Casing Shoe
Max MW = 9.5 ppg HP = 1,255 psi	Max MW = 10.0 ppg HP = 6,345 psi

True Vertical Depth = 12,202 ft
 Bottom Hole Pressure = 5,674 psi
 Pore Pressure Gradient = 0.465 psi/ft
 Max. Sur. Pressure = 3,661 psi
 BOP Required = 5M System

Bottom Hole Temperature = 260 degrees Fahrenheit

Casing Safety Factors			
Surface Casing	Pb = 1.18	Min = 1.100	Pass
	Pc = 1.61	Min = 1.125	Pass
	Sj = 4.56	Min = 1.500	Pass
Production Casing	Pb = 3.58	Min = 1.100	Pass
	Pc = 1.36	Min = 1.125	Pass
	Sj = 2.43	Min = 1.500	Pass

Cement Design Calculations

Critical Depths - Permitting Purposes Only	
Casing/Formation	Measured Depth
Surface Casing	2,761 ft
Top of "G" Sand	5,636 ft
Top of Mesaverde	8,429 ft
Top of Gas	9,230 ft
Total Depth	13,010 ft

Surface Cement	Stg II Lead	Stg I Lead	Tail
Top of Cement (ft)	0	0	2,261
Bottom of Cement (ft)	0	2,261	2,761
Cement Type	Type II	Type II	Class G
Additives (lb/sk)	.25 IntegraSeal	.25 IntegraSeal	
Volume, bbls	0	126	28
Annular vol w/ excess, ft ³	0	921	188
Volume (sks)	0	364	112
Slurry Density (ppg)	12.3	12.3	13.9
Slurry Yield (ft ³ /sk)	2.530	2.530	1.680
Mixwater (gal/sk)	14.80	14.80	8.27
Annular Capacity (BBL)	0.0558	0.0558	0.0558
Annular Capacity (CF)	0.3132	0.3132	0.3132
Excess (%)	0.30	0.30	0.20
Total Sacks =			476
Total Cubic Ft. =			1,109

Production Cement	Lead	Tail
Top of Cement (ft)	5436	8229
Bottom of Cement (ft)	8229	13010
Cement Type	Type II	Class G
Additives (lb/sk)	.25 IntegraSeal	35% Silica
Volume, bbls	183	300
Annular vol w/excess, ft ³	1,029	1683
Volume (sks)	493	895
Slurry Density (ppg)	12.7	13.5
Slurry Yield (ft ³ /sk)	2.090	1.880
Mixwater (gal/sk)	11,200	9,100
Annular Capacity (BBL)	0.0547	0.0547
Annular Capacity (CF)	0.3072	0.3072
Excess (%)	0.20	0.10
Total Sacks =	1,388	
Total Cubic Ft. =	2,712	

NOTES:

Surface

Single track guide shoe and float collar. Bowspring Centralize 1st, 2nd, & 3rd jt. & every 4th joint.
 WOC prior to drill out for a minimum of 500 psi compressive.

Production

Reamer/Guide Shoe, 1jt blank, and Single Valve FC. Spiralizer Centralize 1st, 2nd, 3rd, 6th and 8th. 10' short jt above Ohio Creek
 5 Spiralizers every other joint above drop/TOG From 9230 to 8730

All Casing strings will be tested to .22psi/ft, or 1500 psi, whichever is greater, but will not exceed 70% of the minimum internal yield. If pressure declines more than 10% in 30 minutes, notification will be made and corrective actions will be taken.

Casing Design Calculations

<p>Surface Casing - 36#</p>	<p>Burst Bottom Hole Pressure = TVD * Pore Pressure Gradient = 12202 * 0.465 RG 312-24-298 5673.9 psi RGU 23-6-297 Pburst = Bottom Hole Pressure - (0.22 * TVD) = 5673.93 - (0.22 * 12202) = 2989.5 psi Pb = Casing Burst Rating / Pburst = 3520 / 2989.49 = 1.18 Pb ≥ 1.1 1.18 ≥ 1.1</p> <hr/> <p>Collapse If: Max MW * Setting TVD * 0.052 ≥ Pore Pressure Gradient * Setting TVD 9.5 * 2540 * 0.052 ≥ 0.465 * 2540 1254.8 ≥ 1181.1 Pcollapse = Max MW * Setting TVD * 0.052 = 1254.8 psi Else: Pcollapse = Pore Pressure Gradient * Setting TVD = 1181.1 psi Pcollapse = 1254.8 psi Pc = Casing Collapse Rating / Pcollapse = 2020 / 1254.76 = 1.61 Pc ≥ 1.125 1.61 ≥ 1.125</p> <hr/> <p>Tensile Tension = (Weight1 * Length1) = (36 * 2761) = 99396 lbs Sj = Casing Tension Rating / Tension = 453000 / 99396 = 4.56 Sj ≥ 1.5 4.56 ≥ 1.5</p>
<p>Production Casing</p>	<p>Burst Bottom Hole Pressure = TVD * Pore Pressure Gradient = 12202 * 0.465 = 5673.9 psi Pburst = Bottom Hole Pressure - (0.22 * TVD) = 5673.93 - (0.22 * 12202) = 2989.5 psi Pburst = MATP = 8,500 psi Pburstmax = 8,500 psi Pb = Casing Burst Rating / Pburst max = 10690 / 8500 = 1.26 Pb ≥ 1.1 1.26 ≥ 1.1</p> <hr/> <p>Collapse If: Max MW * Setting TVD * 0.052 ≥ Pore Pressure Gradient * Setting TVD 10 * 12202 * 0.052 ≥ 0.465 * 12202 6345 ≥ 5673.93 Pcollapse = Max MW * Setting TVD * 0.052 = 6345 psi Else: Pcollapse = Pore Pressure Gradient * Setting TVD = 5673.9 psi Pcollapse = 6345 psi Pc = Casing Collapse Rating / Pcollapse = 8650 / 6345.04 = 1.36 Pc ≥ 1.125 1.36 ≥ 1.125</p> <hr/> <p>Tensile Tension = Weight * Length = 11.6 * 13010 = 150916 lbs Sj = Casing Tension Rating / Tension = 367000 / 150916 = 2.43 Sj ≥ 1.5 2.43 ≥ 1.5</p>