



**Horsetail 19N-1924M
REDTAIL
Well Completion
API No. 051233988500
AFE #**

WELL DATA

Surface Location: 660' FSL & 2,656' FEL of Sec 19, T10N, R57W, Weld County, CO

Elevations: Ground Level: 4748 ft. Kelly Bushing: 4766 ft. (18' KB)

Depths: Total Depth: 9370 ft. KBMD

Surface Casing:

<u>OD</u>	<u>Grade</u>	<u>Weight</u>	<u>ID</u>	<u>Drift</u>	<u>Cap</u>	<u>Collapse</u>	<u>Burst</u>	<u>Tensile</u>
9-5/8"	J-55	36.00 lb.	8.921 in	8.765 in	0.0773 bbl/ft	2020 psi	3520 psi	394000 lbs.

Production Casing:

<u>OD</u>	<u>Grade</u>	<u>Weight</u>	<u>ID</u>	<u>Drift</u>	<u>Cap</u>	<u>Collapse</u>	<u>Burst</u>	<u>Tensile</u>
7"	L-80	29	6.184 in	6.059 in	0.0371 bbl/ft	7020 psi	8160 psi	587000 lbs

OBJECTIVE

The following is a procedure to perforate, test, and complete the Horsetail 19N-1924M. The well will be prepped, perforated in the Entrada, Lyons, Wolfcamp, and Missourian formations. All formations will be swabbed and samples will be taken for analysis. Step rate tests will be done on each formation to determine fracture gradients and injectivity.

Drillout, Perforate, and Test Procedure:

1. Provide the COGCC with 48-hour notice of MIRU.
2. MIRU workover rig. Mob-in pump, swivel, two (2) 500 bbl working tanks, one (1) 500 bbl flat tank, and all other necessary equipment. ND wellhead, NU 7-1/16" 5K BOP w/ 2-7/8" pipe rams on top and blind rams on bottom, pressure test high and low, function test BOP. NU circulating head. Have delivered to location 9,500' of 2-7/8" 8rd EUE, 6.5 lb/ft L-80 production tubing for use as workstring (used tbg, from prior well work).
3. PU bit & collars, TIH on 2-7/8 workstring tag float collar at 9,285. Break circulation and Drill out float collar. Drill out shoe joints to 9,326 ft, leave float shoe intact. TOOH LD standing back tbg & LD tools.
4. Load casing and test to 3,000 psi for 15 min.
5. PU pack-off, radial cement bond log and gamma ray log, NU pack-off, RIH to 9,326 ft. Pressure-up csg to 1500 psi, log well to surface under 1500 psi pressure. Discuss results with Engineering Staff, if cmt top and bond is satisfactory, proceed to perforating. (If cement top or bond is lacking, suspend operations and devise remedial cement job.)
6. MIRU wireline. PU 5K lubricator & 20 ft of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Precambrian' from 9,325-9,305 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
7. PU PKR, TIH & set PKR at 9,300 ft. Swab until native fluid recovered. Send samples to lab for analysis. TOOH standing back tbg & LD tools.
8. MIRU acid pumper. Perform step rate test down casing on 'Precambrian' according to rate schedule below, record

rate and pressure.

9. PU 5K lubricator & 20 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Missourian' from 8,529-8,559 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
10. PU 5K lubricator & 20 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Missourian' from 8,508-8,529 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
11. PU 5K lubricator & 14 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Missourian' from 8,483-8,497 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
12. PU 5K lubricator & 12 ft. & 8 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Missourian' from 8,420-8,432 ft. PUH & perforate from 8,399-8,407 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
13. PU 5K lubricator & 7 ft. & 15 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Missourian' from 8,392-8,399 ft. PUH & perforate from 8,370-8,385 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
14. PU 5K lubricator & 12 ft. & 8 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Missourian' from 8,355-8,365 ft. PUH & perforate from 8,340-8,345 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
15. PU 5K lubricator & 8 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Missourian' from 8,327-8,335 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
16. PU RBP & PKR combo & swab tools, RIH & set RBP at 8,570 ft. PUH & set PKR at 8,300 ft. Swab until native fluids recovered. Send samples to lab for analysis. Release PKR, POOH & LDT.
17. Perform step rate test down casing on the 'Missourian' according to rate schedule below. Record rate and pressure. TIH w/ retrieving head, engage RBP, release & TOOH LD tools.
18. PU 5K lubricator & 20 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Wolfcamp' from 7,895-7,915 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
19. PU 5K lubricator & 20 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Wolfcamp' from 7,875-7,895 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
20. PU 5K lubricator & 10 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Wolfcamp' from 7,865-7,875 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
21. PU PKR & RBP retrieval tool combo. RIH to 8,570 ft. & retrieve RBP. PUH to 8,367 ft. & set RBP. PUH & set PKR at 7,860. Swab until native fluids recovered. Send samples to lab for analysis. Release PKR, POOH & LD tools.
22. Perform step rate test down casing on the 'Wolfcamp' according to rate schedule below. Record rate and pressure. TIH w/ retrieving head, engage RBP, release & TOOH LD tools.
23. PU 5K lubricator & 20 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Lyons' from 7,588-7,608 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
24. PU 5K lubricator & 20 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Lyons' from 7,568-7,588 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
25. PU 5K lubricator & 20 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Lyons' from 7,548-7,568 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.

26. PU 5K lubricator & 10 ft. & 8 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'lyons' from 7,538-7,548 ft. PUH & perforate from 7,500-7,508 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
27. PU 5K lubricator & 20 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Lyons' from 7,470-7,490 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
28. PU 5K lubricator & 12 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Lyons' from 7,458-7,470 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
29. PU PKR & RBP & TIH to 7,615 ft. & set RBP. PUH & set PKR at 7,450. Swab until native fluids recovered. Send samples to lab for analysis. Release PKR, POOH & LD tools.
30. Perform step rate test down the casing on the 'Lyons' according to rate schedule below. Record rate and pressure. TIH w/ retrieving head, engage RBP, release & TOOH LD tools.
31. PU 5K lubricator & 8 ft. of 3-1/8" scalloped guns, 6 spf, 60 deg phasing, NU lubricator, RIH and perforate the 'Entrada' from 7,061-7,079 ft. POOH, ND lubricator & LD spent guns. Ensure all shots fired.
32. PU PKR & RBP TIH to 7,085 ft. & set RBP. PUH & set PKR at 7,055. Swab until native fluids recovered. Send samples to lab for analysis. Release PKR, POOH & LD tools.
33. Perform step rate test down the casing on the 'Entrada' according to rate schedule below. Record rate and pressure. TIH w/ retrieving head, engage RBP, release & TOOH LD 2-7/8" tbg & tools.
34. MIRU WL Crew. PU pack-off & 7" CIBP. NU pack-off, RIH & set CIBP at 7055', POOH, ND Pack-off & RDMO WL crew. Fill and test casing to 3000 psi. ND BOP, NU master valve, secure well. RDMO rig and equipment.

Step Rate Test	
Rate (bpm)	Volume (bbl)
1	2
2	4
3	6
4	8
6	12
8	16
10	20
12	24
Total Vol.	92

SAFETY & ENVIRONMENTAL

**** EMERGENCY CONTACTS BELOW ****

Whiting Operating stresses safety and environmental stewardship in all operations. Safety tailgate meetings are encouraged prior to commencing with any major wellsite task. Spills of notable size should be reported and recorded. The proper personal protective equipment (PPE) should be worn at all times while on location. Should there be any questions regarding Whiting's safety/environmental policies, the Wellsite Supervisor will provide instruction.

EMERGENCY CONTACT INFORMATION

Contacts	Phone Number & Description
EMERGENCY	911 or (800) 472-2121
Sheriff's Department (Sterling, CO)	(970) 522-3512 (Logan County)
New Raymer Fire Dept.	(970) 437-5713

After Hours Emergency (WOG)	
Engineer: James Kopp	Cell: (303) 681-1997, Office: (303) 357-1410
Rig Supervisor: Bryan Olmstead	Cell: (970) 290-8333
Operations Supervisor: Mike Staab	Cell: (307) 299-0095, Office: (970) 493-2900