**Razor 21 SWD1**
**REDTAIL**
**Well Completion & MIT**
**API No. 0512340777**
**AFE #**

## WELL DATA

**Surface Location:** 2595' FSL & 2317' FEL of Sec 21, T10N, R58W, Weld County, CO
**Elevations:** Ground Level: 4820 ft. Kelly Bushing: 4838 ft. *(18' KB)*
**Depths:** Total Depth: 8550 ft. KBMD

**Surface Casing:** *Surface - 1584 ft.*

| OD | Grade | Weight | ID | Drift | Cap | Collapse | Burst | Tensile |
|---|---|---|---|---|---|---|---|---|
| *9-5/8"* | *J-55* | *36 lb/ft* | *8.921 in* | *8.765 in* | *0.0773 bbl/ft* | *2020 psi* | *3520 psi* | *394,000 lbs* |

**Production Casing:** *Surface - 8523 ft.*

| OD | Grade | Weight | ID | Drift | Cap | Collapse | Burst | Tensile |
|---|---|---|---|---|---|---|---|---|
| *7"* | *P-110* | *29 lb/ft* | *6.184 in* | *6.059 in* | *0.0371 bbl/ft* | *8510 psi* | *11220 psi* | *797,000 lbs* |

**OBJECTIVE**

This procedure proposes to test the intended SWD zones by perforating, swabbing native fluids, performing a matrix acid stimulation, and performing a step rate test. Injection equipment will then be installed and an MIT will be performed in order to satisfy UIC requirements. The well will then be shut in until approval of the UIC permits.

### Perforate Step Rate Test Procedure, and MIT

1. Provide the COGCC with 48-hour notice of MIRU via electronic form.

2. MIRU WO rig. Mob-in pump, tank, and all other necessary equipment. NU 7-1/16" 5K BOP w/ 3-1/2" pipe rams on top and blind rams on bottom, pressure test high and low, function test BOP. Deliver 8500' of 3-1/2" 9.3 lb/ft EUE workstring. Have delivered two (2) clean 500-bbl upright tanks and fill with fresh water. Heat as necessary, add biocide, corrosion and scale inhibitor. Inhibited water will be used for all wellbore operations.

3. PU bit & scraper TIH on workstring, tag DV collar at +/- 6439', Drill-out DV, make several passes to ensure DV tool 'smooth'. TIH to PBTD (FC at 8478') C/O if necessary, circulat well clean, TOOH standing back tbg LD tools.

4. MIRU wireline. PU Radial CBL, NU pack-off, RIH & log from TD to surface. ND pack-off, LD tools. Correlate CH Logs to OH Logs (GAMMA RAY MEMORY LOG DENSITY / NEUTRON ARRAY INDUCTION, dated Feb 11, 2015).

5. PU perforating guns loaded w/ 6 spf, 60 degree phasing (0.42" EHD min) and pack off, NU pack off to BOP. RIH w/ guns, correlate to OH log, and perforate Amazon 8123'-8135' KB. POOH spent guns, ND pack off, LD gun, and ensure all shots fired.

6. PU PKR & TIH. Set PKR at 8100'. Swab wellbore volume plus minimum of 100 bbls native formation fluid. Sample fluid, label (Amazon formation) and send in for analysis. Release PKR & TOOH standing back, LD tools.

7. PU perforating guns loaded w/ 6 spf, 60 degree phasing (0.42" EHD min) and pack off, NU pack off to BOP. RIH w/ guns, correlate to OH Log, and perforate Lyons 7795'-7830' and 7715'-7770' KB. POOH spent guns, ND pack off, LD gun, and ensure all shots fired.

8. PU RBP & PKR & TIH. Set RBP at 7855', pull up hole & set PKR at 7690'. Swab wellbore volume plus minimum of 100 bbls native formation fluid. Sample fluid, label (Lyons formation) and send in for analysis. Release PKR, TIH & release RBP & TOOH standing back, LD tools.

9. PU perforating guns loaded w/ 6 spf, 60 degree phasing (0.42" EHD min) and pack off, NU pack off to BOP. RIH w/ gun, correlate to OH log, and perforate Entrada 7290'-7305' KB. POOH w/ spent guns, ND pack off, LD gun, and ensure all shots fired.

10. PU RBP & PKR & TIH. Set RBP at 7330', pull up hole & set PKR at 7265'. Swab wellbore volume plus minimum of 100 bbls native formation fluid. Sample fluid, label (Entrada formation) and send in for analysis. Release PKR, TIH & release RBP & TOOH standing back tbg, LD tools.

11. PU PKR & TIH on 3-1/2" tbg. Set PKR at 7265'. Perform 6,300 gal acid job with 15 % HCl & standard additives as shown below, using bio-ball diversion (utilize 500 bio balls, 250 in each diversion). Flush and monitor ISIP and 15 min of pressure fall-off. Perform step-rate injection test the next day with 660 bbl wtr as shown below. Record pressures & rates. Record ISIP and 15 min of pressure fall-off.

**MATRIX ACID STIMULATION**

| Stage | Rate (bpm) | Vol (bbl) | Time (min) |
|---|---|---|---|
| Pad (wtr) | 5 | 10 | 2 |
| 15% HCl | 5 | 50 | 10 |
| Diversion | 5 | 10 | 2 |
| 15% HCl | 5 | 50 | 10 |
| Diversion | 5 | 10 | 2 |
| 15% HCl | 5 | 50 | 10 |
| Flush | 5 | 200 | 40 |
| TOTAL | | 380 | |

**STEP RATE TEST**

| Rate (bpm) | Vol (bbl) | Time (min) |
|---|---|---|
| 1 | 10 | 10 |
| 2 | 20 | 10 |
| 3 | 30 | 10 |
| 4 | 40 | 10 |
| 5 | 50 | 10 |
| 6 | 60 | 10 |
| 7 | 70 | 10 |
| 8 | 80 | 10 |
| 9 | 90 | 10 |
| 10 | 100 | 10 |
| 11 | 110 | 10 |
| TOTAL | 660 | |

12. Release PKR and TOOH laying down tools and workstring.

13. PU nickle-plated Permanent PKR & 5K lubricator. NU lubricator, open well & RIH to 7488' and set PKR. POOH and RD lubricator, LD setting tool, RDMO wireline.

14. PU seal assembly and TIH on 3-1/2" EUE, 9.3 lb/ft, L-80 internally-coated injection tubing. Sting-into PKR PBR, latch-in, ND BOP, land tbg in XX,000 lbs compression, NU WH.

15. Shut in well and give COGCC 10 days notice of intent to perform MIT for injection well permitting.

16. Pressure up annulus to pressure determined through MIT. Shut in and monitor pressure for 30 min. Ensure test is witnessed by state.

17. Bleed off well pressure, shut in well, RDMO rig and equipment.

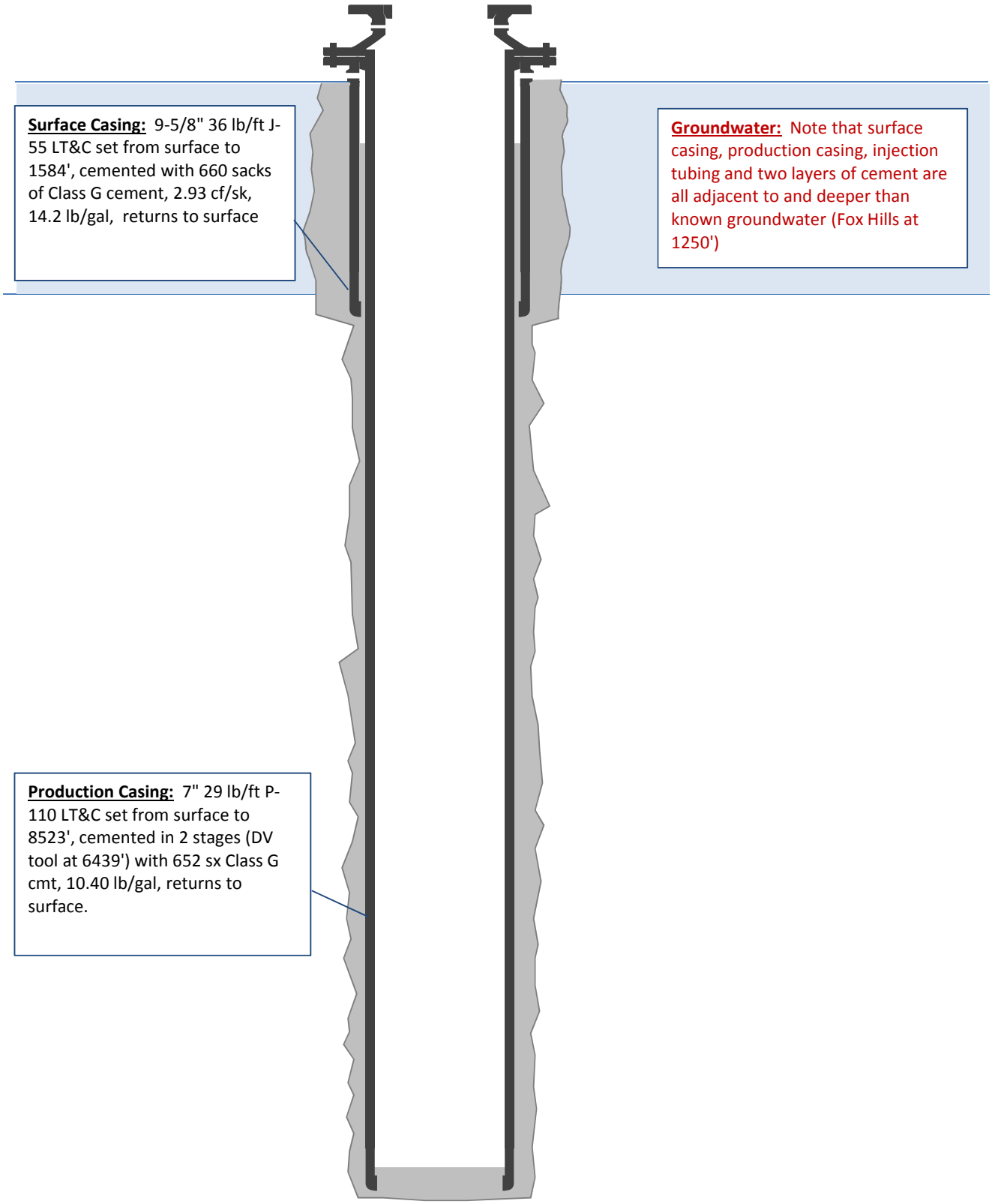
**SAFETY & ENVIRONMENTAL** ****EMERGENCY CONTACTS BELOW****

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: Charles Ohlson** | **Cell: (303) 489-6268, Office: (303) 390-4905** |
| **Rig Supervisor: Brent Brown** | **Cell: (701) 290-0123** |
| **Operations Supervisor: Mike Staab** | **Cell: (307) 299-0095, Office: (970) 493-2900** |

# Razor 21 SWD1  CURRENT WELLBORE DIAGRAM



**Surface Casing:** 9-5/8" 36 lb/ft J-55 LT&C set from surface to 1584', cemented with 660 sacks of Class G cement, 2.93 cf/sk, 14.2 lb/gal, returns to surface

**Groundwater:** Note that surface casing, production casing, injection tubing and two layers of cement are all adjacent to and deeper than known groundwater (Fox Hills at 1250')

**Production Casing:** 7" 29 lb/ft P-110 LT&C set from surface to 8523', cemented in 2 stages (DV tool at 6439') with 652 sx Class G cmt, 10.40 lb/gal, returns to surface.

# Razor 21 SWD1 PROPOSED WELLBORE DIAGRAM