

NGL C2C Abbreviated Stimulation procedure for COGCC Sundry Submission

1. Perform 20,000 gal. 15% HCL acidizing down casing per the following procedure:

*Maximum Well Head Treating Pressure is 4500 psi

**Acid must be inhibited for high temps (325°F+)

Pump 100 bbls to 150 bbls filtered produced water to achieve acceptable rate and pressure before starting acid.

Follow with 20,000 gal 15% HCL.

Flush with 20,000 gal filtered produced water.

Obtain ISDP and 5, 10, 15 minute pressure readings.

2. Prep for slickline operations and step-rate test.
3. MIRU Core-Tech slick-line & lubricator. RIH w/ tandem memory gauges and fishing assembly. Set gauges at PBR top using Core-Tech custom designed, fishable, 7" gauge ring configuration. POOH with slick-line.
4. RU pumping services company to perform SRT via casing. Pressure test treating lines to 5000 psi. Maximum surface treating pressure is 4500 psi. Pump SRT as described below. It is important to maintain a steady pumping rate on each step to allow the pressures to stabilize before moving to the next step.

NGL C2C STEP RATE TEST					
Step	Rate, bpm	Time, min	Filtered Produced Water Volume		Comments
			bbls	gal	
1	2.5	15	37.5	1,575	Get stable pressure before increasing rates; it is important to inject at a steady rate for all steps
2	5	15	75	3,150	
3	7.5	15	113	4,725	
4	10	15	150	6,300	
5	12.5	15	188	7,875	
6	15	10	150	6,300	
7	20	10	200	8,400	
8	30	10	300	12,600	
9	40	10	400	16,800	
Totals		115	1,613	67,725	