

13-3/8" 48# H-40 ST&C csg @ 425'
Cmt'd w/ 410 sxs, circl'd cmt 167 sx

Swedged tight spot in 5-1/2" csg fl 840'-890' (12/1/09)
(Tested csg @ 2623' and circulated out 9-5/8" at surface)

TOC = 1,900' (CBL)

2nd stage (Above DV tool):

cmt'd w/ 1510 sx 11.9/13.2 PPG Interfill H & Super H
full returns throughout stage

9-5/8" 40# J-55 LT&C csg @ 3,490'
Cmt'd w/ 1,160 sx, circl'd cmt to surface

Bone Spring Airstrip Perfs:

9,372'-9,386'
(43 total holes, 3 SPF)

DV Tool @ 9,522'

TOC = DV tool (CBL)

1st stage (Below DV tool)

cmt'd w/ 920 sx 11.9/13.2 PPG Interfill H & Super H
circl'd 23 sx to surface

Strawn Perfs:

12,188'-12,198', 12,204'-12,208'
(44 total holes, 3 SPF)

CIBP @ 13,020' w/ 35' cmt

Fish above CBP left in hole:

1-1/2" SB

1-1/2" Jars

1-1/2" WL connector / 1-3/8" fishing neck

CBP @ 13,221'

Morrow Perfs:

13,052'-13,059', 13,072'-13,078'
(90 total holes, 6 SPF)

Morrow Perfs:

13,199'-13,203', 13,358'-13,363'
(66 total holes, 6 SPF)

CIBP @ 13,425' w/ 2 sx cmt

Morrow Perfs:

13,450'-13,462'
(78 total holes, 6 SPF)

5-1/2" 17# P-110 LT&C csg @ 13,694'
Cmt'd w/ 2,430 sx 2 stages (920 + 1510)

PBTD: 12,985'

TD: 13,696'

Proposed Wellbore Diagram

13-3/8" 48# H-40 ST&C csg @ 425'
Cmt'd w/ 410 sxs, circl'd cmt 167 sx

(Squeezed)
Swedged tight spot in 5-1/2" csg f/ 840'-890' (12/1/09)
(Tested csg @ 2623' and circulated out 9-5/8" at surface)

TOC = 1,900' (CBL)
2nd stage (Above DV tool):
cmt'd w/ 1510 sx 11.9/13.2 PPG Interfill H & Super H
full returns throughout stage

9-5/8" 40# J-55 LT&C csg @ 3,490'
Cmt'd w/ 1,160 sx, circl'd cmt to surface

Bone Spring Airstrip Perfs: (Squeezed)
9,372'-9,386'
(43 total holes, 3 SPF)

Proposed Upper 2nd Bone Spring Perfs:
9,728'-9,752'
(12 total holes, 3 SPF)

DV Tool @ 9,522'
TOC = DV tool (CBL)
1st stage (Below DV tool)
cmt'd w/ 920 sx 11.9/13.2 PPG Interfill H & Super H
circl'd 23 sx to surface

CIBP @ 12,150' & 12,100' w/ 35' cmt

Strawn Perfs:
12,188'-12,198', 12,204'-12,208'
(44 total holes, 3 SPF)

CIBP @ 13,020' w/ 35' cmt

Fish above CBP left in hole:

1-1/2" SB

1-1/2" Jars

1-1/2" WL connector / 1-3/8" fishing neck

CBP @ 13,221'

Morrow Perfs:
13,052'-13,059', 13,072'-13,078'
(90 total holes, 6 SPF)

Morrow Perfs:
13,199'-13,203', 13,358'-13,363'
(66 total holes, 6 SPF)

CIBP @ 13,425' w/ 2 sx cmt

5-1/2" 17# P-110 LT&C csg @ 13,694'
Cmt'd w/ 2,430 sx 2 stages (920 + 1510)

Morrow Perfs:
13,450'-13,462'
(78 total holes, 6 SPF)

PBTD: 12,985'

TD: 13,696'



AFE No: 36718058RC

Procedure Sheet – Hobbs District

PLEASE COMMENCE WITH WORK PER PROCEDURE

Pipeline A Federal Com 3

Recompletion to Upper 2nd Bone Spring Sand.

Wellbore Data

GL: 3,794'

KB: 3,819' (25')

TD: 13,696'

PBTD: 12,985'

Casing: 13-3/8" 48# H-40 ST&C @ 425' cmtd w/ 410 sxs, Circl'd cmt 167 sx

9-5/8" 40# J-55 LT&C @ 3,490' cmtd w/ 1160 sxs, Circl'd cmt

5-1/2" 17# P-110 LT&C @ 13,694' cmtd w/ 2430 sxs TOC – 1900' (CBL) / DV – 9522'

Perforations: Morrow 13,052' – 13,462', Strawn – 12,188' – 12,208', BS Airstrip – 9,372' – 9,386'

CIBP: 13,020' w/ 35' cmt, 13,221', 13,425' w/ 2 sx cmt

Procedure

1. Move in and set proposed Lufkin Mark II 640 unit from NHB yard (SN#:J1204405-498070) prior to any well work.
2. MIRU pulling unit. Have RU and operational safety meeting on location; discuss all risk and potential dangers. Check surface pressures.
3. If necessary, blow down or kill well as needed w/ produced lease water or 2% KCL w/ biocide additive.
4. ND 7-1/16" wellhead flange and flowline. NU 5K dual hydraulic BOP and spool.
5. Release TAC and TOH w/ the following tubing BHA (Be aware of a historical tight spot from 840'-890'):

Current Tubing Detail			
Pipeline A Federal Com 3			
			KB Correction <u>25</u>
12/17/2009			
Quantity	Description	Length	Setting Depth
278	2-3/8" 4.7# N-80/L-80 8rd EUE Tubing	9079.34	9104.34
1	5-1/2" X 2-3/8" TAC	3.75	9108.09
93	2-3/8" 4.7# N-80/L-80 8rd EUE Tubing	3038.49	12146.58
1	2-3/8" API Cup Type SN	1.10	12147.68
1	2-3/8" X 6' Perf Sub	6.00	12153.68
1	2-3/8" 4.7# N-80/L-80 8rd EUE Tubing w/ BP	32.98	12186.66

Describe and take pictures of any scale, paraffin, tubing wear, etc. Send pictures to Midland and send necessary samples in with chemical company. LD all 2-3/8" tubing and send tubing off location (contact Mark Martino/Paul Stock before sending tubing off location).

6. Deliver +380 JTS new 2-7/8" 6.5# L-80 8rd EUE tubing to location.
7. PU 2-7/8" L-80 tubing string and TIH while hydro-testing 2-7/8" tubing to 8,500 psi w/ 4-3/4" bit, 5-1/2" scraper, and 2-7/8" 6.5# L-80 8rd EUE Tubing to 12,160'. TOH. LD bit and scraper.
8. MIRU Apollo wireline and install 5K lubricator. MU and RIH w/ 4-3/4" GR/JB to 12,160'. POH. MU and RIH w/ 5-1/2" 10K CIBP. Set CIBP @ 12,150'. POH w/ wireline.
9. Load hole. (If able to load hole, proceed to next step. If unable to load hole, skip to step 12 and perform both squeezes before coming back to step 9)
10. MU and RIH w/ 5-1/2" 10K CIBP. Set CIBP @ 12,100'. POH w/ wireline.
11. MU and RIH w/ dump bailer on wireline to top of CIBP @ 12,100'. Dumb bail 35' of cement over CIBP. POH w/ wireline. (Make sure sufficient time is allowed for cement to set)
12. MU and RIH w/ Apollo multi-finger caliper magnetic 3D imaging logging tool to 9,800'. Log from 9,800' to surface. RDMO wireline. (Send log results to Midland and wait on further instructions as steps may change)

Casing Leak Squeeze

13. PU and TIH w/ 5-1/2" 10K RBP, 5-1/2" X 2-7/8" Crest compression packer, and 2-7/8" Tbg. Set 5-1/2" RBP @ ± 3480'. PU 5' and set packer. Load and test RBP to 2500 psi. Hold for 5 minutes and report results to Midland. Bleed off pressure. Spot 3 sx sand down tubing on top of RBP.
14. Release packer and TOH to specified depth intervals based off casing integrity log results to isolate casing leak. (Specified depths will be determined followed casing inspection log results)
15. Release packer and TOH w/ packer and tubing to 800'. Set packer @ 800'. (Depth could change based on where casing leak is located from log and isolation work)
16. Move in and set 1 half pit tank along with necessary iron and connections.
17. Hook up and tie-in line off 9-5/8" casing valve and run to pit or tank. Open up 9-5/8" casing valve and pump freshwater w/ biocide additive down tubing, establishing injection rate. Once returns are seen at the surface and rate is established, shut down and report results to Dean Pearson or Mark Martino in Midland. Wait on further instructions. (Cementing design could change based on injection rate results)
18. Bleed off pressure. Unset packer, TOH w/ TBG and packer. LD packer.
19. PU and TIH w/ cement retainer and 2-7/8" Tbg. Set retainer @ 700'. (Depth could change based on casing leak depth)
20. Sting out of retainer and reverse circulate wellbore clean w/ 11 bbls of fresh water w/ biocide additive.
21. Sting back into retainer. Pressure up backside to 200 psi and begin injecting fresh water w/ biocide additive down tubing to establish rate. (Hook up and utilize chart recorder for entire cement squeeze)
22. Once rate is established mix and pump 545 sacks of 14.8# class C cement (ensure to use clean city water for mixing with cement w/o biocide additive), squeezing 5-1/2" casing leak (840' –

- 890'). Once cement returns are seen at surface, continue pumping squeeze until designed cement volumes are pumped or max pressure is reached. **Max pressure is 2500 psi.**
23. Displace cement w/ freshwater within 1 BBL of cement retainer @ 700' (~3 BBL calculated).
24. Once all cement is displaced or as much as the well allows, sting out of retainer (**make sure to shut 5-1/2" casing and install TIW valve before stinging out**). Remove TIW/open 5-1/2" casing, TOH w/ 1 stand of 2-7/8" tubing, and reverse out with 17 bbls of fresh water w/ biocide additive or until cement cleans up. (**If well u-tubes after stinging out of retainer, immediately TOH w/ tubing**)
25. SI for 24 hours to give proper time for cement to set.
26. TIH w/ 4-3/4" mill tooth bit, bit sub, 6 3-1/2" drill collars, and 2-7/8" Tbg to 700' and drill out the cement retainer/cement below retainer down to RBP at 3,480'. Work string up and down to ensure an even clean around the wellbore. (**If cement is green, shut down and contact Dean Pearson or Mark Martino in Midland**)
27. RU pump truck and close rams on casing side. Pump down tubing and pressure test squeeze interval (840'-890') to 500 psi for 30 minutes to ensure proper squeeze. **If the pressure does not hold, call for further directions.** If successful test, open casing rams and proceed to next step.
28. Bleed off pressure. TOH w/ bit and collars and stand back 2-7/8" tubing. LD bit and collars.
29. PU and TIH w/ 2-7/8" tubing, on/off tool, and ported sub down to the 5-1/2" RBP at 3,480'. If fill is encountered, then MIRU reverse unit and establish circulation. Wash down to top of RBP and PU and reverse circulate fill off top of RBP and out of tubing until well cleans up. Latch onto RBP and release. TOH w/ 2-7/8" tubing, RBP retrieval tool, and RBP. LD RBP and retrieval tool.

Bone Spring Airstrip Perf Squeeze

30. PU and TIH w/ 5-1/2" X 2-7/8" Crest compression packer and 2-7/8" Tbg to CIBP at 12,065'. PU 5' and set packer. PU and MU 2-9/16" 10K tubing gate valve w/ 2-7/8" X 2-9/16" adapter flange.

- Load and test CIBP to 8500 psi. Hold for 10 minutes using chart recorder and report results to Midland. Bleed off pressure.
31. Release packer and TOH w/ packer and tubing to 9,350'. Set packer @ 9,350'.
 32. Pump freshwater w/ biocide additive down tubing, establishing injection rate and report results to Dean Pearson or Mark Martino in Midland. Wait for further instructions. (Cementing design could change based on injection rate results)
 33. Bleed off pressure. Unset packer, TOH w/ TBG and packer. LD packer.
 34. PU and TIH w/ cement retainer and 2-7/8" Tbg. Set retainer @ 9,220'.
 35. Sting out of retainer and reverse circulate wellbore clean w/ 140 bbls of fresh water w/ biocide additive.
 36. Sting back into retainer. Pressure up backside to 200 psi and begin injecting fresh water w/ biocide additive down tubing to establish rate. (Hook up and utilize chart recorder for entire cement squeeze)
 37. Once rate is established mix and pump 250 sacks of 15.6# class H cement (ensure to use clean city water for mixing with cement w/o biocide additive), squeezing Bone Spring Airstrip perms (9372' – 9386'). Max Pressure is 8,500 psi.
 38. After cement is pumped away, shut down for enough time to flush out lines/pumps. Resume pumping displacing cement w/ freshwater w/ biocide additive within 5 BBL of cement retainer @ 9,220' (~48 BBL calculated). Start hesitation squeezing until minimal leak off is achieved.
 39. Once all cement is displaced or as much as the well allows, sting out of retainer (make sure to shut 5-1/2" casing and install TIW valve before stinging out). Remove TIW/open 5-1/2" casing, TOH w/ 1 stand of 2-7/8" tubing, and reverse out with 200 bbls of fresh water w/ biocide additive or until cement cleans up. (If well u-tubes after stinging out of retainer, immediately TOH w/ tubing)

- 40. SI for 24 hours to give proper time for cement to set.
- 41. TIH w/ 4-3/4" mill tooth bit, bit sub, 6 3-1/2" drill collars, and 2-7/8" Tbg and drill out the cement retainer/cement below retainer down to 9,500'. Work string up and down to ensure an even clean around the wellbore. (If cement is green, shut down and contact Dean Pearson or Mark Martino in Midland)
- 42. RU pump truck and close rams on casing side. Pump down tubing and pressure test squeeze interval (9,372'-9,386') to 500 psi for 30 minutes to ensure proper squeeze. If the pressure does not hold, call for further directions. If successful test, Open casing rams and TOH w/ tubing and bit assembly. LD bit assembly.

Perforate

- 43. Rig up Apollo wireline and install 5K lubricator.
- 44. MU & RIH w/ 3-1/8" select fire casing guns on wireline (12 total holes, 0.42" diameter holes, 120° phasing) and perforate Upper 2nd Bone Spring Sand at 3 SPF as follows:

Clusters					
Top Shot	Bottom Shot		Length	Space	Perforations
9,751	9,752		1	6	3
9,744	9,745		1	5	3
9,738	9,739		1	9	3
9,728	9,729		1		3

Depth Reference Log: Halliburton Dual-Spaced Neutron Spectral Density

Log Dated: November 2, 2005

- 45. Report observed pressures to Midland.
- 46. Pull perf guns and inspect to ensure all shots fired. Shut well in. Rig down and release wireline.

Frac

- 47. Deliver +9700' 3-1/2" 9.3# L-80 8rd w/ special clearance coupling (turn down collars) rental tubing string to location.



- 48. RU tubing testers. PU and TIH while hydro-testing tubing to 8,500 psi w/ 5-1/2" X 2-7/8" 10K AS-1X packer, O/O tool w/ seal nipple, 3-1/2" X 2-7/8" frac funnel, and 3-1/2" tubing. Set packer @ ± 9,700' w/ 25K compression.
- 49. ND 5K Hydraulic BOP and spool. PU and MU 2-9/16" 10K tubing gate valve w/ 2-7/8" X 2-9/16" adapter flange. Load and pressure up casing to 500 psi and maintain for entire job. RD pulling unit.
- 50. Move in and fill 5 frac tanks with fresh water (w/ 5 gal biocide added per tank) along with the necessary water transfer equipment if needed.
- 51. Move in and rig up Halliburton, test lines to 9500 psi, and frac Upper 2nd Bone Spring Sand perfs per attached frac procedure. Max pressure: 8500 psi. See below for summary:

Stage #	Stage Type	Fluid Type	Clean Vol (gals)	Prop Con (ppa)	Stage Prop (lbs)	Prop Type	Avg Rate (bpm)	Stage Time (mins)	Total Time (mins)
1	Breakdown	Slickwater	2,000				10.0	4.8	4.8
2	Acid	15% HCl	1,000				10.0	2.4	7.2
3	Pad	Slickwater	15,000				25.0	14.3	21.5
4	Prop	Slickwater	6,000	1.00	6,000	100 Mesh Sand	25.0	6.1	27.6
5	Prop	Slickwater	8,000	1.50	12,000	100 Mesh Sand	25.0	8.5	36.1
6	Prop	Slickwater 17# Linear	8,000	2.00	16,000	100 Mesh Sand	25.0	8.8	44.9
7	Prop	Gel 17# XL	6,000	2.50	15,000	30/50 White Sand	25.0	6.8	51.7
8	Prop	Borate 17# XL	6,500	3.00	19,500	30/50 White Sand	25.0	7.6	59.3
9	Prop	Borate 17# XL	7,000	3.50	24,500	30/50 White Sand	25.0	8.5	67.8
10	Prop	Borate	8,000	4.00	32,000	30/50 InnoProp PLT	25.0	10.0	77.8
11	Flush	Slickwater	2,480				25.0	2.4	80.2

- 52. Observe and report ISIP, 5, 10, 15 minute pressures. RDMO Halliburton.
- 53. Hookup flow back equipment. Connect flow back equipment to frac tanks and battery in such a fashion that the well can be turned into the battery when oil production begins.
- 54. Flow well back to tanks. Turn the well into the battery when oil production starts. Flow well back until either sufficient production data is achieved or the well dies.
- 55. Deliver rods to location.

- 56. Release frac tanks and flow back equipment.
- 57. RU pulling unit. ND adapter flange and 10K tubing gate valve. Release packer and TOH w/ 3-1/2" tubing and 5-1/2" X 2-7/8" 10K AS-1X packer w/ frac funnel and O/O tool. LD packer assembly and 3-1/2" rental tubing string. (contact Mark Martino/Paul Stock before sending tubing off location)
- 58. PU and TIH w/ the following tubing BHA (visually inspect 2-7/8" tubing while going in hole to ensure no cement remains in string):

Tubing Detail (Proposed)			
Pipeline A Federal Com 3			
			KB Correction <u>25</u>
Quantity	Description	Length	Setting Depth
~294	2-7/8" 6.5# L-80 8rd EUE Tubing	9550.40	9575.40
1	5-1/2" X 2-7/8" TAC w/ carbide slips	3.00	9578.40
3	2-7/8" 6.5# L-80 8rd EUE Tubing	97.50	9675.90
1	2-7/8" SN	1.10	9677.00
1	2-7/8" X 4' Lift Sub	4.10	9681.10
1	3-1/2" Mother Hubbard	30.50	9711.60
2	2-7/8" 6.5# L-80 8rd EUE Tubing w/ BP	65.50	9777.10

Set TAC in 18K tension or 37.10" equivalent tubing stretch.

- 59. ND 5K BOP and spool, NU B-5 flange adapter and flowline.
- 60. TIH w/ the following rod BHA:

Rod Detail (Proposed)			
Pipeline A Federal Com 3			
Quantity	Description	Length	Setting Depth
1	1-1/2" x 26' SMPR	26.00	26.00
121	7/8" WFT HD Rods	3,025.00	3051.00
250	3/4" WFT HD Rods	6,250.00	9301.00
14	1-1/2" Grade C Sinker Bars	350.00	9651.00
1	2-1/2" x 1-1/4" x 26' RHBC Pump	26.00	9677.00
1	1" X 12' Gas Anchor	12.00	9689.00

- 61. Space out rods, subs, and PR. Load and test tubing to 500 psi.
- 62. Install horsehead, polish rod and stuffing box.



AFE No: 36718058RC

63. Sheave unit, put unit in long hole (144" stroke), turn on, and run unit at 7.0 SPM.

64. RDMO WSU and return well to production.

BUREAU OF LAND MANAGEMENT

Carlsbad Field Office
620 East Greene Street
Carlsbad, New Mexico 88220
575-234-5972

Permanent Abandonment of Production Zone Conditions of Approval

Failure to comply with the following Conditions of Approval may result in a Notice of Incidents of Noncompliance (INC) in accordance with 43 CFR 3163.1.

1. Plug back operations shall commence within **ninety (90)** days from this approval. **If you are unable to plug back the well by the 90th day provide this office, prior to the 90th day, with the reason for not meeting the deadline and a date when we can expect the well to be plugged back. Failure to do so will result in enforcement action.**
2. **Notification:** Contact the appropriate BLM office at least 24 hours prior to the commencing of any plug back operations. For wells in Eddy County, call 575-361-2822. For wells in Lea County, call 575-393-3612
3. **Blowout Preventers:** A blowout preventer (BOP), as appropriate, shall be installed before commencing any plugging operation. The BOP must be installed and maintained as per API and manufacturer recommendations. The minimum BOP requirement is a 2M system for a well not deeper than 9,090 feet; a 3M system for a well not deeper than 13,636 feet; and a 5M system for a well not deeper than 22,727 feet.
4. **Mud Requirement:** Mud shall be placed between all plugs. Minimum consistency of plugging mud shall be obtained by mixing at the rate of 25 sacks (50 pounds each) of gel per 100 barrels of **brine** water. Minimum nine (9) pounds per gallon.
5. **Cement Requirement:** Sufficient cement shall be used to bring any required plug to the specified depth and length. Any given cement volumes on the proposed plugging procedure are merely estimates and are not final. Unless specific approval is received, no plug except the surface plug shall be less than 25 sacks of cement. Any plug that requires a tag will have a minimum WOC time of 4 hours. In lieu of a cement plug across perforations in a cased hole (not for any other plugs), a bridge plug set within 50 feet to 100 feet above the perforations shall be capped with 25 sacks of cement. **Before pumping cement on top of CIBP, tag will be required to verify depth. Based on depth, a tag of the cement may be deemed necessary.** Unless otherwise specified in the approved procedure, the cement plug shall consist of either **Neat Class "C"**, for up to 7,500 feet of depth or **Neat Class "H"**, for deeper than 7,500 feet plugs.
6. **Subsequent Plug back Reporting:** Within 30 days after plug back work is completed, file one original and three copies of the Subsequent Report, Form 3160-5 to BLM. The report should give in detail the manner in which the plug back work was carried out, the extent (by depths) of cement plugs placed, and the size and location (by depths) of casing left in the well. **Show date work was completed.** If plugging back to a new zone submit a Completion Report, form 3160-4 with the Subsequent Report.
7. **Trash:** All trash, junk and other waste material shall be contained in trash cages or bins to prevent scattering and will be removed and deposited in an approved sanitary landfill. Burial on site is not permitted.
8. **If well location is within the Timing Limitation Stipulation Area for Lesser Prairie-Chicken:** From March 1st through June 15th annually, abandonment activities will be allowed except between the hours from 3:00 am and 9:00 am. Normal vehicle use on existing roads will not be restricted