

HALLIBURTON

iCem[®] Service

PDC ENERGY-EBUS

Date: Thursday, February 21, 2019

Challenger 2N Production

Job Date: Thursday, February 07, 2019

Sincerely,

Bryce Hinsch

Legal Notice

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Challenger 2N** cement **production** casing job. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

Approximately 54 bbls of spacer were returned to surface.

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Respectfully,

Halliburton Fort Lupton

The Road to Excellence Starts with Safety

| | | | | | | | | | | | |
|---|------------------------------|--------------------|------------|-----------------------------------|----------------------------|---------------------------|------------------------|-----------------------------|---------------|---------------|---------------------|
| Sold To #: 304535 | | Ship To #: 3839596 | | Quote #: | | Sales Order #: 0905464529 | | | | | |
| Customer: PDC ENERGY-EBUS | | | | Customer Rep: Chris McMullin | | | | | | | |
| Well Name: CHALLENGER | | | Well #: 2N | | API/UWI #: 05-123-45891-00 | | | | | | |
| Field: WATTENBERG | | City (SAP): KERSEY | | County/Parish: WELD | | State: COLORADO | | | | | |
| Legal Description: SE NW-8-4N-64W-1343FNL-2431FWL | | | | | | | | | | | |
| Contractor: ENSIGN DRLG | | | | Rig/Platform Name/Num: ENSIGN 152 | | | | | | | |
| Job BOM: 7523 7523 | | | | | | | | | | | |
| Well Type: HORIZONTAL OIL | | | | | | | | | | | |
| Sales Person: HALAMERICA\HX38199 | | | | Srv Supervisor: Kamereon White | | | | | | | |
| Job | | | | | | | | | | | |
| Formation Name | | | | | | | | | | | |
| Formation Depth (MD) | | Top | | Bottom | | | | | | | |
| Form Type | | | | BHST | | | | | | | |
| Job depth MD | | 14213ft | | Job Depth TVD | | | | | | | |
| Water Depth | | | | Wk Ht Above Floor | | 5 | | | | | |
| Perforation Depth (MD) | | From | | To | | | | | | | |
| Well Data | | | | | | | | | | | |
| Description | New / Used | Size in | ID in | Weight lbm/ft | Thread | Grade | Top MD ft | Bottom MD ft | Top TVD ft | Bottom TVD ft | |
| Casing | | 9.625 | 8.921 | 36 | | | 0 | 1678 | | 0 | |
| Casing | | 5.5 | 4.778 | 20 | | | 0 | 14193 | | 0 | |
| Open Hole Section | | | 8.5 | | | | 1678 | 6904 | 0 | 0 | |
| Open Hole Section | | | 8.5 | | | | 6904 | 14193 | 0 | 0 | |
| Tools and Accessories | | | | | | | | | | | |
| Type | Size in | Qty | Make | Depth ft | | Type | Size in | Qty | Make | | |
| | | | | | | Top Plug | 5.5 | 1 | WTHR | | |
| Float Shoe | 5.5 | 1 | | 14193 | | Bottom Plug | 5.5 | 1 | WTHR | | |
| Float Collar | 5.5 | 1 | | 14165 | | | | | | | |
| | | | | | | Plug Container | 5.5 | 1 | HES | | |
| | | | | | | Centralizers | 5.5 | 201 | | | |
| Fluid Data | | | | | | | | | | | |
| Stage/Plug #: 1 | | | | | | | | | | | |
| Fluid # | Stage Type | Fluid Name | | | Qty | Qty UoM | Mixing Density lbm/gal | Yield ft ³ /sack | Mix Fluid Gal | Rate bbl/min | Total Mix Fluid Gal |
| 1 | 12.5 lb/gal Tuned Spacer III | Tuned Spacer III | | | 150 | bbl | 12.5 | 2.72 | 16.8 | | |

| Fluid # | Stage Type | Fluid Name | Qty | Qty UoM | Mixing Density lbm/gal | Yield ft3/sack | Mix Fluid Gal | Rate bbl/min | Total Mix Fluid Gal |
|---------------------|--------------------|--|-------------|---------|---------------------------|------------------------|------------------|-----------------|------------------------|
| 2 | Gasstop B1 | GASSTOP (TM) SYSTEM | 625 | sack | 13.2 | 1.55 | | 6 | 7.61 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Fluid # | Stage Type | Fluid Name | Qty | Qty UoM | Mixing Density lbm/gal | Yield ft3/sack | Mix Fluid Gal | Rate bbl/min | Total Mix Fluid Gal |
| 3 | ElastiCem | ELASTICEM (TM) SYSTEM | 1064 | sack | 14.4 | 1.7 | | 8 | 7.3 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Fluid # | Stage Type | Fluid Name | Qty | Qty UoM | Mixing Density lbm/gal | Yield ft3/sack | Mix Fluid Gal | Rate bbl/min | Total Mix Fluid Gal |
| 4 | MMCR Displacement | MMCR Displacement | 20 | bbl | 8.34 | | | | |
| 0.50 gal/bbl | | MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781) | | | | | | | |
| | | | | | | | | | |
| Fluid # | Stage Type | Fluid Name | Qty | Qty UoM | Mixing Density lbm/gal | Yield ft3/sack | Mix Fluid Gal | Rate bbl/min | Total Mix Fluid Gal |
| 5 | Displacement fluid | | 294 | bbl | 8.34 | | | | |
| | | | | | | | | | |
| Cement Left In Pipe | Amount | 28 ft | | | Reason | | | Shoe Joint | |
| Mix Water: | pH 7 | Mix Water Chloride: | < 400 ppm | | | Mix Water Temperature: | 74 °F | | |
| | | Plug Displaced by: | 8.33 lb/gal | | | | | | |
| Plug Bumped? | Yes | Bump Pressure: | 3250 psi | | | Floats Held? | Yes | | |
| Spacer Returns: | 54 bbl | Returns Density: | 12.5 lb/gal | | | | | | |
| Comment | | | | | | | | | |

2.0 Real-Time Job Summary

2.1 Job Event Log

| Type | Seq. No. | Activity | Graph Label | Date | Time | Source | DS Pump Press (psi) | DH Density (ppg) | Comb Pump Rate (bbl/min) | Pump Stg Tot (bbl) | Comments |
|-------|----------|--|--|----------|----------|--------|------------------------|---------------------|-----------------------------|-----------------------|--|
| Event | 1 | Call Out | Call Out | 2/6/2019 | 05:30:00 | USER | | | | | Crew called out and was requested to be on location @ 11:00. |
| Event | 2 | Depart Yard Safety Meeting | Depart Yard Safety Meeting | 2/6/2019 | 10:00:00 | USER | | | | | Crew discussed the route of travel and supervisor called in a journey. Had to get approval because of the weather. |
| Event | 3 | Depart from Service Center or Other Site | Depart from Service Center or Other Site | 2/6/2019 | 10:20:00 | USER | | | | | Crew left the yard. |
| Event | 4 | Arrive at Location from Service Center | Arrive at Location from Service Center | 2/6/2019 | 11:15:00 | USER | | | | | Crew arrived on location early and the rig was running casing. |
| Event | 5 | Safety Meeting - Assessment of Location | Safety Meeting - Assessment of Location | 2/6/2019 | 11:30:00 | USER | | | | | Spotting in trucks and supervisor met with the customer and got the well information. TD-14,200' TP-14,193' SJ-28' FC-14,165' Cas-5.5" 20# P110 PC-9.625" 36# Set @ 1678' Mud Weight-10.7 ppg WBM, Wet Shoe- 5 Bbls TVD-6904' OH-8.5." |
| Event | 6 | Pre-Rig Up Safety Meeting | Pre-Rig Up Safety Meeting | 2/6/2019 | 11:40:00 | USER | | | | | Discussed rig up procedure and signed the JSA. |
| Event | 7 | Rig-Up Equipment | Rig-Up Equipment | 2/6/2019 | 11:50:00 | USER | | | | | Rigged up all HES equipment and lines. |
| Event | 8 | Casing on Bottom | Casing on Bottom | 2/6/2019 | 13:00:00 | USER | | | | | Casing on Bottom with the landing joint. The rig |

| | | | | | | | | | | | |
|-------|----|------------------------|------------------------|----------|----------|------|-------|------|------|--------|---|
| | | | | | | | | | | | circulated 4 bottoms up it took 3:45 @ 10.5 bpm. |
| Event | 9 | Rig-Up Completed | Rig-Up Completed | 2/6/2019 | 13:00:00 | USER | | | | | All HES equipment and lines rigged up safely. |
| Event | 10 | Pre-Job Safety Meeting | Pre-Job Safety Meeting | 2/6/2019 | 18:30:00 | USER | 5.00 | 8.06 | 0.00 | 0.30 | Discussed the job procedure and pressures with all personnel involved with the cement job. |
| Event | 11 | Other | Other | 2/6/2019 | 18:40:00 | USER | 5.00 | 8.07 | 0.00 | 0.30 | First attempt to fill lines, after we broke the rigs hose off from circulating the well, we tied our line up to the manifold and the pump was primed up and ready to pump. When i opened the bottom valve to start filling the lines, the WBM hydrostatic fed back through our standpipe all the way to the wash up tank. |
| Event | 12 | Other | Other | 2/6/2019 | 18:45:00 | USER | 7.00 | 8.74 | 0.00 | 0.40 | Attempted to thaw pump truck and iron using rig heater and steam line. |
| Event | 13 | Other | Other | 2/6/2019 | 19:00:00 | USER | 11.00 | 8.74 | 0.00 | 0.40 | The Halliburton rep went and talked to the customer about possible issues, and discussed proper procedures to get this issue resolved, We ended up rigging down HES line to rig up the rigs hose to continue to circulate the well while we resolved the issues. |
| Event | 14 | Other | Other | 2/6/2019 | 19:30:00 | USER | 5.00 | 8.98 | 0.00 | 0.50 | Co.man verified 1500 bbls of fresh water on location. |
| Event | 15 | Other | Other | 2/7/2019 | 00:26:00 | USER | 81.00 | 8.38 | 0.00 | 232.20 | The vac truck showed up to |

| | | | | | | | | | | | |
|-------|----|------------------|------------------|----------|----------|------|---------|-------|------|--------|---|
| | | | | | | | | | | | start pulling the Latex out of the the Latex upright. |
| Event | 16 | Other | Other | 2/7/2019 | 03:00:00 | USER | | | | | Rigged all the un frozen iron back up to the rig floor. |
| Event | 17 | Other | Other | 2/7/2019 | 04:00:00 | USER | | | | | The soft side trailer with the New Latex showed up on location. |
| Event | 18 | Other | Other | 2/7/2019 | 04:15:00 | USER | | | | | Started mixing up Latex in the Latex Upright tank. |
| Event | 19 | Other | Other | 2/7/2019 | 05:00:00 | USER | | | | | Vac truck completed his tasks for Halliburton and sucked the wash up tank out for the cement job. |
| Event | 20 | Start Job | Start Job | 2/7/2019 | 06:23:47 | COM4 | 2.00 | 0.02 | 0.00 | 281.20 | Started recording data. |
| Event | 21 | Prime Pumps | Prime Pumps | 2/7/2019 | 06:41:02 | COM4 | 2.00 | 4.27 | 0.00 | 281.20 | Primed pumps and lines. |
| Event | 22 | Other | Other | 2/7/2019 | 06:46:42 | COM4 | 0.00 | 17.70 | 0.80 | 289.40 | Filled the lines with 2 bbls of water 3 bpm 110 psi. |
| Event | 23 | Test Lines | Test Lines | 2/7/2019 | 06:48:53 | COM4 | 4188.00 | 8.59 | 0.00 | 291.10 | Tested to 4500 psi and held for 30 sec due to the sub zero tempatures. No leaks. |
| Event | 24 | Pump Spacer 1 | Pump Spacer 1 | 2/7/2019 | 06:53:05 | COM4 | 121.00 | 8.50 | 0.00 | 291.10 | Pumped 150 bbls of tuned spacer III @ 12.5 ppg 2.72 yield 16.8 gal/sk 6 bpm 450 psi. |
| Event | 25 | Check Weight | Check Weight | 2/7/2019 | 06:55:18 | COM4 | 274.00 | 10.85 | 1.90 | 3.60 | Checked the weight of the tuned spacer with the pressurized mud scales, scaled @ 12.5 ppg. |
| Event | 26 | Drop Bottom Plug | Drop Bottom Plug | 2/7/2019 | 07:18:57 | COM4 | 375.00 | 12.54 | 6.20 | 141.50 | Dropped the bottom plug on the fly @ 140 bbls gone into spacer. |
| Event | 27 | Pump Lead Cement | Pump Lead Cement | 2/7/2019 | 07:24:39 | COM4 | 320.00 | 13.42 | 5.00 | 162.00 | Pumped 173 bbls of Latex lead cement @ 13.2 ppg 1.55 yield 7.61 Gal/sk (625 |

| | | | | | | | | | | | |
|-------|----|----------------------|----------------------|----------|----------|------|---------|-------|------|--------|--|
| | | | | | | | | | | | sks) 6 bpm 640 psi. |
| Event | 28 | Check Weight | Check Weight | 2/7/2019 | 07:24:46 | COM4 | 324.00 | 13.44 | 5.00 | 0.60 | Checked the weight of the Latex Lead Cement with the pressurized mud scales, scaled @ 13.2 ppg. |
| Event | 29 | Check Weight | Check Weight | 2/7/2019 | 07:29:05 | COM4 | 623.00 | 13.38 | 7.20 | 29.80 | Checked the weight of the Latex Lead Cement with the pressurized mud scales, scaled @ 13.3 ppg. |
| Event | 30 | Pump Tail Cement | Pump Tail Cement | 2/7/2019 | 08:06:24 | COM4 | 730.00 | 14.64 | 6.20 | 24.70 | Pumped 322 bbls of Tail Cement @ 8 bpm 870 psi. 14.4 ppg, 1.7 yield 7.3 gal/sk (1064 sks). |
| Event | 31 | Check Weight | Check Weight | 2/7/2019 | 08:13:42 | COM4 | 406.00 | 14.57 | 4.10 | 56.80 | Checked the weight of the Tail Cement with the pressurized mud scales, scaled @ 14.4 ppg. |
| Event | 32 | Shutdown | Shutdown | 2/7/2019 | 09:04:16 | COM4 | 80.00 | 7.63 | 3.00 | 372.30 | Shutdown to wash pumps and lines to the wash up tank. |
| Event | 33 | Drop Top Plug | Drop Top Plug | 2/7/2019 | 09:10:18 | COM4 | 68.00 | 7.65 | 0.00 | 376.20 | The Customer, Weatherford, Halliburton rep witnessed the top plug being loaded and dropped. |
| Event | 34 | Pump Displacement | Pump Displacement | 2/7/2019 | 09:10:23 | COM4 | 66.00 | 7.68 | 0.00 | 376.20 | Pumped 314 bbls of water for displacement with the first 20 bbls with MMCR and then we used SASWAW 3025 Water Treatment that the rig supplied for the remainder of displacement and left the last 20 bbls fresh. |
| Event | 35 | Displ Reached Cement | Displ Reached Cement | 2/7/2019 | 09:15:02 | COM4 | 1126.00 | 7.76 | 9.50 | 21.80 | @ 22 bbls into displacement we caught the plug. |
| Event | 36 | Bump Plug | Bump Plug | 2/7/2019 | 10:13:15 | COM4 | 3245.00 | 8.28 | 0.00 | 341.40 | Bumped the plug on |

| | | | | | | | | | | | |
|-------|----|--|--|----------|----------|------|---------|------|------|--------|--|
| | | | | | | | | | | | calculated displacement, The final circulating psi was 2850 psi and took 500 psi over to 3250 psi and shutdown the pump. |
| Event | 37 | Other | Other | 2/7/2019 | 10:14:16 | COM4 | 3358.00 | 8.27 | 0.00 | 341.40 | Pressured up to rupture the disk and to shift the wet shoe sub,it shifted @ 4200 psi and pumped a 5 bbl wet shoe. |
| Event | 38 | Other | Other | 2/7/2019 | 10:15:14 | COM4 | 3194.00 | 8.31 | 4.80 | 343.30 | Checked the floats and the floats held, we got 3 bbls back. |
| Event | 39 | Pre-Rig Down Safety Meeting | Pre-Rig Down Safety Meeting | 2/7/2019 | 10:20:00 | USER | 22.00 | 8.17 | 0.00 | 348.00 | Crew held a safety meeting discussing the rig down and flush stack procedure. Also all potential hazards associated with rigging down all HES equipment and lines. |
| Event | 40 | Rig Down Lines | Rig Down Lines | 2/7/2019 | 10:25:00 | USER | 21.00 | 5.64 | 0.00 | 348.00 | The crew rigged down all HES equipment and lines. |
| Event | 41 | Rig-Down Completed | Rig-Down Completed | 2/7/2019 | 11:30:00 | USER | | | | | Rig down completed no one got hurt. |
| Event | 42 | Pre-Convoy Safety Meeting | Pre-Convoy Safety Meeting | 2/7/2019 | 11:50:00 | USER | | | | | The crew held a pre journey safety meeting discussing the route and potential hazards while driving. The supervisor called in a journey. |
| Event | 43 | Depart Location for Service Center or Other Site | Depart Location for Service Center or Other Site | 2/7/2019 | 12:00:00 | USER | | | | | Kamereon White and crew would like to thank you for your business and choosing Halliburton Cement. If you have any questions please feel free to call. |