

HALLIBURTON

iCem[®] Service

PDC ENERGY EBUS

Jacobucci 32K-403

Production

Job Date: Wednesday, May 04, 2016

Sincerely,
Derek Trier

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Jacobucci 32K-403** 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.

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 [Ft. Lupton]

Job Times

| | Date | Time | Time Zone |
|-------------------------|-----------|------|-----------|
| Called Out Time: | 5/03/2016 | 1800 | MTN |
| Arrived On Location At: | | 2200 | |
| Job Started At: | 5/04/2016 | 1239 | |
| Job Completed At: | | 1657 | |
| Departed Location At: | | 1830 | |

| | | | |
|--|--------------------|-----------------------------------|---------------------------|
| Sold To #: 304535 | Ship To #: 3649797 | Quote #: | Sales Order #: 0903260621 |
| Customer: PDC ENERGY - EBUS | | Customer Rep: Dean Haighte | |
| Well Name: JACOBUCCI | Well #: 32K-403 | API/UWI #: 05-123-41169-00 | |
| Field: SPINDLE | City (SAP): DACONO | County/Parish: WELD | State: COLORADO |
| Legal Description: NW SW-32-1N-67W-2347FSL-1068FWL | | | |
| Contractor: ENSIGN DRLG | | Rig/Platform Name/Num: ENSIGN 121 | |
| Job BOM: 7523 | | | |
| Well Type: HORIZONTAL OIL | | | |
| Sales Person: HALAMERICA\HB71271 | | Srvc Supervisor: Nathaniel Moore | |

Job

| | | | |
|------------------------|---------|--|-------------------|
| Formation Name | | | |
| Formation Depth (MD) | Top | | Bottom |
| Form Type | | | BHST |
| Job depth MD | 13981ft | | Job Depth TVD |
| Water Depth | | | Wk Ht Above Floor |
| 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 | LTC | J-55 | 0 | 1830 | | |
| Casing | | 5.5 | 4.778 | 20 | | P-110 | 0 | 13976 | | |
| Open Hole Section | | | 8.5 | | | | 1830 | 13981 | | |

Tools and Accessories

| Type | Size in | Qty | Make | Depth ft | Type | Size in | Qty | Make |
|--------------|---------|-----|------|----------|----------------|---------|-----|------|
| Guide Shoe | 5.5 | | | 13976 | Top Plug | 5.5 | 1 | Team |
| Float Shoe | 5.5 | | | 13959.7 | Bottom Plug | 5.5 | | HES |
| Float Collar | 5.5 | | | | SSR plug set | 5.5 | | HES |
| Insert Float | 5.5 | | | | Plug Container | 5.5 | | HES |
| Stage Tool | 5.5 | | | | Centralizers | 5.5 | | HES |

Fluid Data

| Stage/Plug #: 1 | | | | | | | | | |
|-----------------|------------------------|--------------------|-----|---------|------------------------|----------------|---------------|--------------|---------------------|
| 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 |
| 1 | Mud Flush III (Powder) | Mud Flush III | 40 | bbl | 8.4 | | | 6 | |
| 42 gal/bbl | | FRESH WATER | | | | | | | |

| 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 | ElastiCem | ELASTICEM (TM) SYSTEM | 1137 | sack | 13.2 | 1.57 | | 6 | 7.49 | |
| 7.49 Gal | | FRESH WATER | | | | | | | | |
| 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 | EconoCem | ECONOCEM (TM) SYSTEM | 2040 | sack | 13.5 | 1.65 | | 4 | 7.87 | |
| 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 | Water | Water Displacement | 308 | bbl | 8.33 | | | | | |
| | | | | | | | | | | |
| Cement Left In Pipe | | Amount | 16 ft | | Reason | | | Shoe Joint | | |

2.0 Real-Time Job Summary

2.1 Job Event Log

| Type | Seq. No. | Activity | Graph Label | Date | Time | Source | Pass-Side Pump Pressure (psi) | Downhole Density (ppg) | Combined Pump Rate (bbl/min) | Comments |
|-------|----------|---------------------------------------|---------------------------------------|----------|----------|--------|-------------------------------|------------------------|------------------------------|--|
| Event | 1 | Call Out | Call Out | 5/3/2016 | 18:00:00 | USER | | | | Verify equipment and materials |
| Event | 2 | Depart Yard Safety Meeting | Depart Yard Safety Meeting | 5/3/2016 | 21:00:00 | USER | | | | Journey management conducted with crew |
| Event | 3 | Assessment Of Location Safety Meeting | Assessment Of Location Safety Meeting | 5/3/2016 | 22:00:00 | USER | | | | Rig still running casing. |
| Event | 4 | Other | Other | 5/3/2016 | 22:05:00 | USER | | | | TD 13981' 8.5" open hole. 13976' 5.5" 20# P-110 casing. Float collar @ 13959.7'. Surface 1833' 9.625" 36#. Mud weight 9.3 ppg. Rig will pump pill with dye once casing is on bottom to determine hole volume and adjust cement volume accordingly. Customer rep: Dean Haighte. Production manager: Tony Abarientos |
| Event | 5 | Pre-Rig Up Safety Meeting | Pre-Rig Up Safety Meeting | 5/3/2016 | 22:10:00 | USER | | | | Spot in equipment and rig up |
| Event | 6 | Other | Casing on bottom | 5/4/2016 | 08:00:00 | USER | | | | Rig filling casing then will establish circulation and pump pill to determine hole volume |
| Event | 7 | Other | Other | 5/4/2016 | 11:00:00 | USER | | | | Rig circulated pill to surface. Determined that cement volume on location wasn't adequate for job. Ordered 280 sks tail at 1200 to be delivered to location. Had to send drivers to pick it up. |
| Event | 8 | Pre-Job Safety Meeting | Pre-Job Safety Meeting | 5/4/2016 | 11:45:00 | USER | | | | Discuss job procedure with rig and HES crew. |
| Event | 9 | Start Job | Start Job | 5/4/2016 | 12:39:03 | COM1 | | | | Extra cement being loaded to leave the yard by 1300. Advised company rep to wait for cement to be loaded and in transit before starting job. PDC rep wanted to start job anyways and mix at a slower rate until cement arrived. Filled lines with 3 bbl water |
| Event | 10 | Test Lines | Test Lines | 5/4/2016 | 12:44:47 | COM1 | 4840.00 | 8.32 | 0.00 | Tested lines to 4800 psi. |
| Event | 11 | Pump Spacer 1 | Pump Mud flush III | 5/4/2016 | 12:50:46 | COM1 | 118.00 | 8.27 | 0.00 | 40 bbl of mud flush with red dye in the last 10 bbl. |

| | | | | | | | | | | |
|-------|----|--------------------------------|--------------------------------|----------|----------|------|---------|-------|------|---|
| Event | 12 | Pump Lead Cement | Pump Lead Cement | 5/4/2016 | 13:11:55 | COM1 | 516.00 | 13.11 | 2.40 | 1137 sks/318 bbl 1.57 ft3/sk 7.49 gal/sk. Pumped first 20 bbl at 13 ppg to increase total volume at customer request. |
| Event | 13 | Check Weight | Check weight lead | 5/4/2016 | 13:16:06 | COM1 | 493.00 | 13.07 | 5.00 | 13 ppg verified with pressurized mud scale |
| Event | 14 | Other | Cement arrived on location | 5/4/2016 | 13:53:00 | USER | 98.00 | 13.21 | 5.20 | Had pumped first 250 bbl lead at 5 bpm to allow time for cement to arrive. Picked up rate to 7.5 bpm for remainder of cement. |
| Event | 15 | Check Weight | Check weight lead | 5/4/2016 | 13:55:21 | COM1 | 221.00 | 13.19 | 7.50 | 13.2 ppg |
| Event | 16 | Pump Tail Cement | Pump Tail Cement | 5/4/2016 | 14:11:59 | COM1 | 173.00 | 13.49 | 6.00 | 2040 sks/600 bbl 13.5 ppg 1.65 ft3/sk 7.87 gal/sk |
| Event | 17 | Check Weight | Check weight tail | 5/4/2016 | 14:13:35 | COM1 | 205.00 | 13.52 | 6.70 | 13.5 ppg |
| Event | 18 | Check Weight | Check weight tail | 5/4/2016 | 14:20:31 | COM1 | 288.00 | 13.57 | 8.00 | 13.5 ppg |
| Event | 19 | Check Weight | Check weight | 5/4/2016 | 15:00:50 | COM1 | 309.00 | 13.52 | 8.00 | 13.5 ppg |
| Event | 20 | Check Weight | Check weight | 5/4/2016 | 15:22:44 | COM1 | 302.00 | 13.51 | 8.00 | 13.5 ppg |
| Event | 21 | Shutdown | Shutdown | 5/4/2016 | 15:36:15 | COM1 | | | | |
| Event | 22 | Clean Lines | Clean Lines | 5/4/2016 | 15:38:43 | COM1 | | | | |
| Event | 23 | Drop Top Plug | Drop Top Plug | 5/4/2016 | 15:43:47 | COM1 | | | | Dropped Team latchdown plug. Verified by team hand and customer rep |
| Event | 24 | Pump Displacement | Pump Displacement | 5/4/2016 | 15:43:50 | COM1 | | | | 308 bbl water |
| Event | 25 | Other | Cement to surface | 5/4/2016 | 16:05:31 | COM1 | | | | 150 bbl into displacement. Called 40 bbl mud flush and 150 bbl cement to surface total |
| Event | 26 | Bump Plug | Bump Plug | 5/4/2016 | 16:40:38 | COM1 | | | | 2330 psi final circulating pressur. Pressured up to 2680 psi. |
| Event | 27 | Pressure Up Well | Pressure Up Well | 5/4/2016 | 16:41:04 | COM1 | | | | Pressure test casing for 15 minutes. Pressure increased 200 psi during test |
| Event | 28 | Pre-Rig Down Safety Meeting | Pre-Rig Down Safety Meeting | 5/4/2016 | 16:45:00 | USER | 2738.00 | 8.27 | 0.00 | Safety meeting with HES crew |
| Event | 29 | End Job | End Job | 5/4/2016 | 16:57:56 | COM1 | | | | |
| Event | 30 | Depart Location Safety Meeting | Depart Location Safety Meeting | 5/4/2016 | 18:30:00 | USER | | | | Journey management conducted with crew |