

# HALLIBURTON

iCem<sup>®</sup> Service

## **EXTRACTION OIL & GAS-EBUS**

**United A S16-20-6N**

United A S16-20-6N

Job Date: Saturday, May 23, 2020

Sincerely,

**Nick Roles and Crew**

## Legal Notice

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### Disclaimer:

All information in this report is provided subject to the terms and conditions which govern the services provided by Halliburton. Halliburton personnel use their best efforts in gathering information and their best judgment in interpreting it, but any interpretation, research, analysis or recommendation furnished by Halliburton are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and empirical relationships and assumptions are not infallible, and with respect to which professionals in the industry may differ. iCem 3D Displacement results are used to understand how fluids intermix during a cement job. Simulation and 3D displacement results are not intended as and should not be used as a replacement for bond logs in determining top of cement. Current 3D model calculations are known to model more volume than the input volume for standard cases due to known calculation improvements required. For rotational cases, the modeled volume will be impacted by the same calculations impacting the standard cases, as well as additional constraints imposed to make the calculation time required operationally feasible. Therefore, until further notice, 3D displacement results should not be used for replacement of a bond log, or used as an identifier of top of cement. HALLIBURTON IS UNABLE TO GUARANTEE THE ACCURACY OF ANY CHART INTERPRETATION, RESEARCH ANALYSIS, OR JOB RECOMMENDATION and any interpretation or recommendation is not for use of or reliance upon by any third party. The customer has full responsibility for any of its decisions which are based on the information provided in this report.

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## 1.0 Cementing Job Summary

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### 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the United A S16-20-6N surface casing. 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 20 bbls of cement 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 #: 369404                                | Ship To #: 3909335     | Quote #:                          | Sales Order #: 0906520023 |
| Customer: EXTRACTION OIL & GAS-EBUS              |                        | Customer Rep: Manny Parras        |                           |
| Well Name: UNITED A                              | Well #: S16-20-6N      | API/UWI #: 05-014-20806-00        |                           |
| Field: WATTENBERG                                | City (SAP): BROOMFIELD | County/Parish: BROOMFIELD         | State: COLORADO           |
| Legal Description: NE NE-9-1S-68W-426FNL-1221FEL |                        |                                   |                           |
| Contractor: ENSIGN DRLG                          |                        | Rig/Platform Name/Num: ENSIGN 147 |                           |
| Job BOM: 7521 7521                               |                        |                                   |                           |
| Well Type: HORIZONTAL OIL                        |                        |                                   |                           |
| Sales Person: HALAMERICA/HX41066                 |                        | Srvc Supervisor: Nicholas Roles   |                           |

**Job**

|                        |        |                   |        |
|------------------------|--------|-------------------|--------|
| Formation Name         |        |                   |        |
| Formation Depth (MD)   | Top    |                   | Bottom |
| Form Type              | BHST   |                   |        |
| Job depth MD           | 1631ft | Job Depth TVD     | 1631ft |
| 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            |        |       | 0         | 1631         | 0          | 1631          |
| Open Hole Section |            |         | 13.5  |               |        |       | 0         | 1640         | 0          | 1640          |

**Tools and Accessories**

| Type         | Size in | Qty | Make | Depth ft | Type           | Size in | Qty | Make |
|--------------|---------|-----|------|----------|----------------|---------|-----|------|
| Guide Shoe   |         |     |      |          | Top Plug       | 9.625   | 1   | HES  |
| Float Shoe   | 9.625   |     |      | 1631     | Bottom Plug    |         |     |      |
| Float Collar | 9.625   |     |      | 1587     | SSR plug set   |         |     |      |
| Insert Float |         |     |      |          | Plug Container | 9.625   | 1   | HES  |
| Stage Tool   |         |     |      |          | Centralizers   |         |     |      |

**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               | Water      | Water      | 10  | bbl     | 8.34                   |                |               | 5            |                     |  |

  

| 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   | Water with dye    | Water with dye                  | 10                                    | bbbl           | 8.34                          |                                     |                      | 5                   |                            |
| <b>Fluid #</b>                                | <b>Stage Type</b> | <b>Fluid Name</b>               | <b>Qty</b>                            | <b>Qty UoM</b> | <b>Mixing Density lbm/gal</b> | <b>Yield ft3/sack</b>               | <b>Mix Fluid Gal</b> | <b>Rate bbl/min</b> | <b>Total Mix Fluid Gal</b> |
| 3   | SwiftCem          | SWIFTCEM (TM) SYSTEM            | 600                                   | sack           | 13.5                          | 1.74                                |                      | 8                   | 9.17                       |
| 9.17 Gal                                      |                   | <b>FRESH WATER</b>              |                                       |                |                               |                                     |                      |                     |                            |
| 0.1250 lbm                                    |                   | <b>POLY-E-FLAKE (101216940)</b> |                                       |                |                               |                                     |                      |                     |                            |
| <b>Fluid #</b>                                | <b>Stage Type</b> | <b>Fluid Name</b>               | <b>Qty</b>                            | <b>Qty UoM</b> | <b>Mixing Density lbm/gal</b> | <b>Yield ft3/sack</b>               | <b>Mix Fluid Gal</b> | <b>Rate bbl/min</b> | <b>Total Mix Fluid Gal</b> |
| 3   | Displacement      | Displacement                    | 122                                   | bbbl           | 8.34                          |                                     |                      | 10                  |                            |
| <b>Cement Left In Pipe</b>                    |                   | <b>Amount</b>                   | 44 ft                                 |                |                               | <b>Reason</b>                       |                      | <b>Shoe Joint</b>   |                            |
| <b>Mix Water:</b>                             |                   | pH 7                            | <b>Mix Water Chloride:</b> 1000 ppm   |                |                               | <b>Mix Water Temperature:</b> 65 °F |                      |                     |                            |
| <b>Cement Temperature:</b>                    |                   | 70°F                            | <b>Plug Displaced by:</b> 8.33 lb/gal |                |                               | <b>Disp. Temperature:</b> 65 °F     |                      |                     |                            |
| <b>Plug Bumped?</b>                           |                   | Yes                             | <b>Bump Pressure:</b> 1280 psi MPa    |                |                               | <b>Floats Held?</b>                 |                      | Yes                 |                            |
| <b>Cement Returns:</b>                        |                   | 20bbbl                          | <b>Returns Density:</b>               |                |                               | <b>Returns Temperature:</b>         |                      |                     |                            |
| <b>Comment</b> Got 20bbbls cement to surface. |                   |                                 |                                       |                |                               |                                     |                      |                     |                            |

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

| Type  | Seq. No. | Activity                               | Graph Label                            | Date      | Time     | Source | Dwnhole Density<br><i>(ppg)</i> | Cmb Pump Rate<br><i>(bbl/min)</i> | Pump A Pressure<br><i>(psi)</i> | Cmb Stg Total<br><i>(bbl)</i> | Comments   |
|-------|----------|--|--|-----------|----------|--------|---------------------------------|-----------------------------------|---------------------------------|-------------------------------|--|
| Event | 1        | Call Out                               | Call Out                               | 5/23/2020 | 02:00:00 | USER   |                                 |                                   |                                 |                               | Called out by Service Coordinator for O/L at 0800  |
| Event | 2        | Arrive at Location from Service Center | Arrive at Location from Service Center | 5/23/2020 | 06:00:00 | USER   |                                 |                                   |                                 |                               | Upon arrival met with company man to discuss job details and calculations, performed hazard hunt and site assessment. Stayed OL from previous surface. |
| Event | 3        | Pre-Rig Up Safety Meeting              | Pre-Rig Up Safety Meeting              | 5/23/2020 | 07:45:44 | USER   |                                 |                                   |                                 |                               | Discussed rigging up hazards and procedure according to HMS.   |
| Event | 4        | Rig-Up Date/Time                       | Rig-Up Date/Time                       | 5/23/2020 | 07:50:00 | USER   |                                 |                                   |                                 |                               | Begin Rig-up.  |
| Event | 5        | Rig-Up Completed                       | Rig-Up Completed                       | 5/23/2020 | 08:00:00 | USER   |                                 |                                   |                                 |                               | Rig-up complete with no injuries.  |
| Event | 6        | Other                                  | Other                                  | 5/23/2020 | 08:10:00 | USER   | 8.60                            | 0.00                              | -1.07                           | 0.00                          | Water test- PH-6, Chlor-0, Temp-65. Cement temp-70.  |
| Event | 7        | Pre-Job Safety Meeting                 | Pre-Job Safety Meeting                 | 5/23/2020 | 10:25:00 | USER   | 8.42                            | 0.00                              | -0.71                           | 16.38                         | Held safety meeting with all job associated personnel to discuss job procedure, hazards and stop work authority.                                       |
| Event | 8        | Start Job                              | Start Job                              | 5/23/2020 | 10:37:47 | NONE   | 0.00                            | 0.00                              | -1.57                           | 16.38                         | TD-1640' OH-13.5", TP-1631' 9.625" 36#, FC-1587, Mud-8.8#  |
| Event | 9        | Prime Pumps                            | Prime Pumps                            | 5/23/2020 | 10:43:07 | NONE   | 5.94                            | 0.82                              | 18.12                           | 16.57                         |  |
| Event | 10       | Test Lines                             | Test Lines                             | 5/23/2020 | 10:44:00 | NONE   | 8.37                            | 0.00                              | 76.92                           | 17.61                         | Pumped 2bbls to fill lines, established circulation,   |

shutdown and closed manifold, performed 500psi k/o function test, continued with 5th gear stall at 1200psi proceeded to bring pressure to 3000psi. Pressure stabilized and held with no leaks.

|       |    |                                     |                                     |           |          |      |       |      |         |        |  |
|-------|----|-------------------------------------|-------------------------------------|-----------|----------|------|-------|------|---------|--------|--|
| Event | 11 | Pump Spacer 1                       | Pump Spacer 1                       | 5/23/2020 | 10:45:18 | NONE | 8.39  | 0.00 | 78.07   | 0.00   | Pumped 10bbls fresh water at 5bpm 190psi.  |
| Event | 12 | Pump Spacer 2                       | Pump Spacer 2                       | 5/23/2020 | 10:48:05 | NONE | 8.35  | 4.88 | 190.60  | 0.08   | Pumped 10bbls fresh water with 1# Red Dye at 5bpm 140psi.                            |
| Event | 13 | Pump Cement                         | Pump Cement                         | 5/23/2020 | 10:50:14 | USER | 8.27  | 4.89 | 184.89  | 10.53  | Pumped 600skts or 186bbls 13.5# 1.74y 9.2g/s Swiftcem at 9bpm 560si.                 |
| Event | 14 | Check Weight                        | Check Weight                        | 5/23/2020 | 10:51:41 | NONE | 14.09 | 4.89 | 222.17  | 17.72  | Weight verified with pressurized mud scales.   |
| Event | 15 | Shutdown                            | Shutdown                            | 5/23/2020 | 11:11:44 | NONE | -0.49 | 0.00 | 77.21   | 189.66 | Wash up on top of plug.  |
| Event | 16 | Drop Top Plug                       | Drop Top Plug                       | 5/23/2020 | 11:11:50 | NONE | -0.53 | 0.00 | 54.50   | 189.66 | Dropped by HES supervisor, witnessed by company man.                                 |
| Event | 17 | Pump Displacement                   | Pump Displacement                   | 5/23/2020 | 11:11:57 | NONE | -0.54 | 0.00 | 40.68   | 0.00   | Pumped 122bbls of fresh water at 10bpm.  |
| Event | 18 | Other                               | Other                               | 5/23/2020 | 11:33:15 | NONE | 8.37  | 0.00 | 1098.63 | 122.27 | Released pressure and got 0.5bbls back. Floats held.                                 |
| Event | 19 | End Job                             | End Job                             | 5/23/2020 | 11:34:00 | NONE | 8.27  | 0.00 | 7.16    | 122.27 | Got 20bbls cement to surface.  |
| Event | 20 | Pre-Rig Down Safety Meeting         | Pre-Rig Down Safety Meeting         | 5/23/2020 | 11:45:00 | USER |       |      |         |        | Discussed rigging down hazards and procedure according to HMS with all HES personnel |
| Event | 21 | Safety Meeting - Departing Location | Safety Meeting - Departing Location | 5/23/2020 | 12:00:00 | USER |       |      |         |        | Held meeting with all personnel in convoy to discuss directions and                  |

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|       |    |  |  |           |          |      |  |
|-------|----|--|--|-----------|----------|------|--|
|       |    |  |  |           |          |      | hazards associated with drive, all fit to drive. |
| Event | 22 | Depart Location for Service Center or Other Site | Depart Location for Service Center or Other Site | 5/23/2020 | 12:15:00 | USER | Pre journey management prior to departure.       |

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## 3.0 Attachments

### 3.1 United A S16-20-6N-Custom Results.png

