

# HALLIBURTON

iCem<sup>®</sup> Service

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

**INTERCHANGE A S16-20-19C**

Surface

Sincerely,

**Andrew McIntosh**

## Legal Notice

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### Disclaimer:

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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 **INTERCHANGE A S16-20-19C** cement **SURFACE** 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.

#### **20 BBLS OF CEMENT 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 #: 3901277     |                    | Quote #:                           |                            | Sales Order #: 0905986323 |  |
| Customer: EXTRACTION OIL & GAS -                  |  |                        |                    | Customer Rep: HANS / JUSTIN        |                            |                           |  |
| Well Name: INTERCHANGE A                          |  |                        | Well #: S16-20-19C |                                    | API/UWI #: 05-014-20770-00 |                           |  |
| Field: WATTENBERG                                 |  | City (SAP): BROOMFIELD |                    | County/Parish: BROOMFIELD          |                            | State: COLORADO           |  |
| Legal Description: SW NW-10-1S-68W-2109FNL-921FWL |  |                        |                    |                                    |                            |                           |  |
| Contractor: ENSIGN DRLG                           |  |                        |                    | Rig/Platform Name/Num: ENSIGN 147  |                            |                           |  |
| Job BOM: 7521 7521                                |  |                        |                    |                                    |                            |                           |  |
| Well Type: HORIZONTAL OIL                         |  |                        |                    |                                    |                            |                           |  |
| Sales Person: HALAMERICA\HX38199                  |  |                        |                    | Srcv Supervisor: Nikolaus Kornafel |                            |                           |  |

**Job**

|                        |        |  |                   |
|------------------------|--------|--|-------------------|
| Formation Name         |        |  |                   |
| Formation Depth (MD)   | Top    |  | Bottom            |
| Form Type              |        |  | BHST              |
| Job depth MD           | 1634ft |  | 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      | 0          | 9.625   | 8.921 | 36            |        |       | 0         | 1634         | 0          | 1634          |
| OH          |            | 13.5    |       |               |        |       | 0         | 1634         | 0          | 1634          |

**Tools and Accessories**

| Type         | Size in | Qty | Make | Depth ft | Type           | Size in | Qty | Make |
|--------------|---------|-----|------|----------|----------------|---------|-----|------|
|              |         |     |      |          | Top Plug       | 9.625   | 1   | HES  |
| Float Shoe   | 9.625   | 1   |      | 1634     |                |         |     |      |
| Float Collar | 9.625   | 1   |      | 1592     |                |         |     |      |
|              |         |     |      |          | Plug Container | 9.625   | 1   | HES  |
|              |         |     |      |          | Centralizers   | 9.625   | 2   | N/A  |

**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               | Red Dye Spacer | Red Dye Spacer | 10  | bbl     | 8.33                   |                |               |              | 420                 |

| Fluid # | Stage Type | Fluid Name           | Qty | Qty UoM | Mixing Density<br>lbm/gal | Yield<br>ft <sup>3</sup> /sack | Mix Fluid<br>Gal | Rate<br>bbl/min | Total Mix<br>Fluid<br>Gal |
|---------|------------|----------------------|-----|---------|---------------------------|--------------------------------|------------------|-----------------|---------------------------|
| 2       | SwiftCem   | SWIFTCEM (TM) SYSTEM | 550 | sack    | 13.5                      | 1.74                           | 9.17             | 5               | 5,043                     |

| Fluid # | Stage Type  | Fluid Name  | Qty | Qty UoM | Mixing Density<br>lbm/gal | Yield<br>ft <sup>3</sup> /sack | Mix Fluid<br>Gal | Rate<br>bbl/min | Total Mix<br>Fluid<br>Gal |
|---------|-------------|-------------|-----|---------|---------------------------|--------------------------------|------------------|-----------------|---------------------------|
| 3       | Fresh Water | Fresh Water | 124 | bbl     | 8.33                      |                                |                  | 8               |                           |

| Cement Left In Pipe | Amount | Reason                         | Shoe Joint                   |
|---------------------|--------|--------------------------------|------------------------------|
| Mix Water:          | pH 7   | Mix Water Chloride: 0 ppm      | Mix Water Temperature: 62 °F |
| Cement Temperature: | N/A    | Plug Displaced by: 8.33 lb/gal | Disp. Temperature: 62 °F     |
| Plug Bumped?:       | Yes    | Bump Pressure: 478 psi         | Floats Held? Yes             |
| Cement Returns:     | 20 bbl | Returns Density: N/A           | Returns Temperature: N/A     |

**Comment** – Once the rig was done circulating they handed it over to Halliburton. We pumped a 10 BBL water spacer with red dye in it. Followed by 170.44 BBL'S of our swift cem cement at 13.5 #/Gal . We shut down after cement was pumped to drop the top plug, followed by 124 BBL'S of displacement. Bumped plug at calculated displacement. Checked floats 1 BBL back to the truck. Floats held.

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

| Type  | Seq. No. | Activity                               | Graph Label                            | Date      | Time     | Source | DS Pump Press<br><i>(psi)</i> | DH Density<br><i>(ppg)</i> | Comb Pump Rate<br><i>(bbl/min)</i> | Pump Stg Tot<br><i>(bbl)</i> | Comments   |
|-------|----------|--|--|-----------|----------|--------|-------------------------------|----------------------------|------------------------------------|------------------------------|--|
| Event | 1        | Call Out                               | Call Out                               | 9/18/2019 | 06:00:00 | USER   |                               |                            |                                    |                              | CREW CALLED OUT AT 06:00, REQUESTED ON LOCATION 12:00. CREW PICKED UP CEMENT, CHEMICALS, AND PLUG CONTAINER FROM FT. LUPTON, CO. BULK 660 10025030, BULK 660 10867415, AND PUMP 11368474   |
| Event | 2        | Pre-Convoy Safety Meeting              | Pre-Convoy Safety Meeting              | 9/18/2019 | 10:15:00 | USER   |                               |                            |                                    |                              | CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.   |
| Event | 3        | Crew Leave Yard                        | Crew Leave Yard                        | 9/18/2019 | 10:30:00 | USER   |                               |                            |                                    |                              | STARTED JOURNEY MANAGEMENT.  |
| Event | 4        | Arrive at Location from Service Center | Arrive at Location from Service Center | 9/18/2019 | 11:00:00 | USER   |                               |                            |                                    |                              | MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING- 9.625" 36 LB/FT @ 1,634', 13.5" OPEN HOLE 1,634', SHOE TRAC- 41', MUD WEIGHT 8.4 LB/GAL PUMP FRESH WATER DISPLACEMENT 123 BBLS. CASING LANDED @ 18:30 9/18/2019. RIG CIRCULATED BOTTOMS UP AT 357 GPM AT 94 PSI. |
| Event | 5        | Pre-Rig Up Safety Meeting              | Pre-Rig Up Safety Meeting              | 9/18/2019 | 11:15:00 | USER   |                               |                            |                                    |                              | HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS  |

|       |    |                        |                        |           |          |       |        |       |      |       | ASSOCIATED WITH<br>LOCATION, RIG UP, AND<br>WEATHER.  |
|-------|----|------------------------|------------------------|-----------|----------|-------|--------|-------|------|-------|---|
| Event | 6  | Rig-Up Equipment       | Rig-Up Equipment       | 9/18/2019 | 11:30:00 | USER  |        |       |      |       | CREW STAGED<br>EQUIPMENT AND RIGGED<br>UP BULK, IRON AND WATER<br>HOSES TO PERFORM JOB.   |
| Event | 7  | Pre-Job Safety Meeting | Pre-Job Safety Meeting | 9/18/2019 | 18:35:00 | USER  |        |       |      |       | SAFETY MEETING WITH<br>HALLIBURTON, AND RIG<br>PERSONNEL. CREW<br>COMMUNICATED<br>POTENTIAL SAFETY<br>HAZARDS, AND JOB<br>DETAILS.  |
| Event | 8  | Start Job              | Start Job              | 9/18/2019 | 19:14:03 | COM11 | 22.00  | 7.66  | 0.00 | 7.30  | BEGAN RECORDING JOB<br>DATA.  |
| Event | 9  | Test Lines             | Test Lines             | 9/18/2019 | 19:15:20 | COM11 | 82.00  | 8.35  | 0.00 | 9.50  | PRESSURE TESTED IRON TO<br>2500 PSI. HELD WITH NO<br>LEAKS.   |
| Event | 10 | Pump Spacer 1          | Pump Spacer 1          | 9/18/2019 | 19:21:30 | COM11 | 2.00   | 7.63  | 1.20 | 0.00  | PUMPED 10 BBLS OF RED<br>DYE SPACER AT 5 BPM<br>WITH A PRESSURE OF 140<br>PSI.  |
| Event | 11 | Check Weight           | Check Weight           | 9/18/2019 | 19:26:34 | COM11 | 68.00  | 8.35  | 1.90 | 9.40  | DENSITY VERIFIED BY<br>PRESSURIZED MUD SCALES.  |
| Event | 12 | Pump Lead Cement       | Pump Lead Cement       | 9/18/2019 | 19:27:19 | COM11 | 46.00  | 8.36  | 0.00 | 0.00  | PUMPED 550 SACKS OF<br>SWIFT CEM CEMENT, AT<br>13.5 LB/GAL , 1.74 FT3/SK,<br>9.17 GAL/SK. 170 BBLS.<br>DENSITY VERIFIED BY<br>PRESSURIZED MUD SCALES.<br>PUMPED AT 8 BPM WITH A<br>PRESSURE OF 380 PSI. |
| Event | 13 | Check Weight           | Check Weight           | 9/18/2019 | 19:35:11 | COM11 | 297.00 | 13.50 | 8.10 | 44.20 | DENSITY VERIFIED BY<br>PRESSURIZED MUD SCALES.  |

|       |    |                                     |                                     |           |          |       |         |       |       |        |   |
|-------|----|-------------------------------------|-------------------------------------|-----------|----------|-------|---------|-------|-------|--------|---|
| Event | 14 | Check Weight                        | Check Weight                        | 9/18/2019 | 19:39:21 | COM11 | 292.00  | 13.52 | 8.10  | 78.10  | DENSITY VERIFIED BY PRESSURIZED MUD SCALES  |
| Event | 15 | Shutdown                            | Shutdown                            | 9/18/2019 | 19:51:05 | COM11 | 91.00   | 12.97 | 0.00  | 172.70 | SHUTDOWN PUMPS  |
| Event | 16 | Drop Top Plug                       | Drop Top Plug                       | 9/18/2019 | 19:53:09 | COM11 | 4.00    | 16.14 | 0.00  | 172.70 | TOP PLUG LEFT THE PLUG CONTAINER, VERIFIED BY CO. MAN.  |
| Event | 17 | Pump Displacement                   | Pump Displacement                   | 9/18/2019 | 19:53:37 | COM11 | 3.00    | 16.26 | 0.00  | 0.00   | PUMPED 123 BBLS OF FRESH WATER DISPLACEMENT, AT 8 BPM, WITH A PRESSURE OF 500 PSI. GOT 10 BBLS OF RED DYE SPACER AND 20 BBLS OF CEMENT BACK TO SURFACE. |
| Event | 18 | Bump Plug                           | Bump Plug                           | 9/18/2019 | 20:14:24 | COM11 | 1006.00 | 8.14  | 0.00  | 125.50 | BUMPED PLUG AT CALCULATED DISPLACEMENT, FINAL CIRCULATING PRESSURE 478 PSI, AT 3 BPM. BROUGHT PRESSURE UP TWO 1100 PSI                                  |
| Event | 19 | Other                               | Other                               | 9/18/2019 | 20:15:21 | COM11 | 37.00   | 8.10  | 0.00  | 125.50 | CHECKED FLOATS AND RECIEVED 1 BBL BACK TO THE TRUCK. FLOATS HELD.   |
| Event | 20 | End Job                             | End Job                             | 9/18/2019 | 20:15:52 | COM11 | -4.00   | 8.11  | 0.00  | 125.50 | STOP RECORDING JOB DATA   |
| Event | 21 | Pre-Rig Down Safety Meeting         | Pre-Rig Down Safety Meeting         | 9/18/2019 | 20:19:00 | USER  | 217.00  | 8.13  | 10.40 | 130.90 | DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.   |
| Event | 22 | Rig-Down Completed                  | Rig-Down Completed                  | 9/18/2019 | 20:55:00 | USER  |         |       |       |        | ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL, AND LOCATION WAS CLEAN.   |
| Event | 23 | Safety Meeting - Departing Location | Safety Meeting - Departing Location | 9/18/2019 | 22:00:00 | USER  |         |       |       |        | CREW DISCUSSED ROUTES HAZARDS AND   |

COMMUNICATION WITH  
CREW.

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## 3.0 Attachments

### 3.1 EXTRACTION INTERCHANGE A S16-20-19C-Custom Results.png

