

# HALLIBURTON

iCem<sup>®</sup> Service

## **EXTRACTION OIL & GAS**

**For: Ty Entenmann**

Date: Friday, February 27, 2015

**GP-DAIRY 1-20-19**

GP-DAIRY 1-20-19

Job Date: Saturday, January 24, 2015

Sincerely,

**Sebastian Estensoro**

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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 **GP Dairy 1-20-19**, cement **KOP** 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 Brighton**

#### Job Times

|                                | Date      | Time |
|--------------------------------|-----------|------|
| Requested Time<br>On Location: | 1/23/2015 | 2230 |
| Called Out Time:               | 1/23/2015 | 1400 |
| Arrived On<br>Location At:     | 1/23/2015 | 2230 |
| Job Started At:                | 1/24/2015 | 0203 |
| Job Completed At:              | 1/24/2015 | 0315 |
| Departed Location<br>At:       | 1/24/2015 | 0520 |

1.2 Planned Pumping Schedule

| Event                   | Pressure (psi) | Rate (bpm) | Volume (bbl) | Sacks | Density (ppg) | Yield (ft3/sk) | WR (gal/sk) |
|-------------------------|----------------|------------|--------------|-------|---------------|----------------|-------------|
| START JOB               |                |            |              |       |               |                |             |
| FILL LINES              |                |            |              |       |               |                |             |
| PRESSURE TEST           | 3000           |            |              |       |               |                |             |
| CLEAN SPACER AHEAD      |                | 4          | 30           |       | 13            | 1.78           | 27.6        |
| CEMENT                  |                | 4          | 44           |       | 17.5          | 0.94           | 3.32        |
| CLEAN SPACER BEHIND     |                | 1          | 5            |       | 13            | 1.78           | 27.6        |
| DISPLACEMENT TO BALANCE |                | 6          | 71           |       | 12            |                |             |
| SHUT DOWN               |                |            |              |       |               |                |             |

**HALLIBURTON**

**Cementing Job Summary**

*The Road to Excellence Starts with Safety*

| Sold To #: 369404                                 |                  | Ship To #: 3596219     |                 | Quote #:                         |                                   | Sales Order #: 0902070803   |               |              |                     |               |  |
|---|------------------|------------------------|-----------------|----------------------------------|-----------------------------------|-----------------------------|---------------|--------------|---------------------|---------------|--|
| Customer: EXTRACTION OIL & GAS                    |                  |                        |                 | Customer Rep: Shawn M            |                                   |                             |               |              |                     |               |  |
| Well Name: GP-DAIRY                               |                  |                        | Well #: 1-20-19 |                                  |                                   | API/UWI #: 05-123-40328-00  |               |              |                     |               |  |
| Field: WATTENBERG                                 |                  | City (SAP): GREELEY    |                 | County/Parish: WELD              |                                   | State: COLORADO             |               |              |                     |               |  |
| Legal Description: NE NE-20-5N-65W-658FNL-1305FEL |                  |                        |                 |                                  |                                   |                             |               |              |                     |               |  |
| Contractor: H & P DRLG                            |                  |                        |                 | Rig/Platform Name/Num: H & P 319 |                                   |                             |               |              |                     |               |  |
| Job BOM: 7529                                     |                  |                        |                 |                                  |                                   |                             |               |              |                     |               |  |
| Well Type: HORIZONTAL OIL                         |                  |                        |                 |                                  |                                   |                             |               |              |                     |               |  |
| Sales Person: HALAMERICA\HB21661                  |                  |                        |                 |                                  | Srvc Supervisor: Steven Markovich |                             |               |              |                     |               |  |
| <b>Job</b>  |                  |                        |                 |                                  |                                   |                             |               |              |                     |               |  |
| Formation Name                                    |                  |                        |                 |                                  |                                   |                             |               |              |                     |               |  |
| Formation Depth (MD)                              |                  | Top                    |                 |                                  | Bottom                            |                             |               |              |                     |               |  |
| Form Type   |                  |                        |                 |                                  | BHST                              |                             |               |              |                     |               |  |
| Job depth MD                                      |                  | 7712ft                 |                 |                                  | Job Depth TVD                     |                             |               |              |                     |               |  |
| Water Depth                                       |                  |                        |                 |                                  | Wk Ht Above Floor                 |                             |               |              |                     |               |  |
| Perforation Depth (MD)                            |                  | From                   |                 |                                  | To                                |                             |               |              |                     |               |  |
| <b>Well Data</b>                                  |                  |                        |                 |                                  |                                   |                             |               |              |                     |               |  |
| 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  | 3                | 9.625                  | 8.921           | 36                               |                                   |                             | 0             | 882          | 0                   | 0             |  |
| Open Hole Section                                 |                  |                        | 8.75            |                                  |                                   |                             | 882           | 7712         | 0                   | 0             |  |
| <b>Fluid Data</b>                                 |                  |                        |                 |                                  |                                   |                             |               |              |                     |               |  |
| <b>Stage/Plug #: 1</b>                            |                  |                        |                 |                                  |                                   |                             |               |              |                     |               |  |
| Fluid #   | Stage Type       | Fluid Name             | Qty             | Qty UoM                          | Mixing Density lbm/gal            | Yield ft <sup>3</sup> /sack | Mix Fluid Gal | Rate bbl/min | Total Mix Fluid Gal |               |  |
| 1   | Plug #1          | GRANITECEM (TM) SYSTEM | 268             | sack                             | 17.5                              | 0.94                        |               | 5            | 3.32                |               |  |
| 3.32 Gal  |                  | FRESH WATER            |                 |                                  |                                   |                             |               |              |                     |               |  |
| Fluid #   | Stage Type       | Fluid Name             | Qty             | Qty UoM                          | Mixing Density lbm/gal            | Yield ft <sup>3</sup> /sack | Mix Fluid Gal | Rate bbl/min | Total Mix Fluid Gal |               |  |
| 2   | CLEANSRACE R III | CLEANSRACER III        | 35              | bbl                              | 13                                | 1.78                        |               |              |                     |               |  |
| 0 gal/bbl   |                  | FRESH WATER            |                 |                                  |                                   |                             |               |              |                     |               |  |
| Cement Left In Pipe                               |                  | Amount                 | Reason          |                                  |                                   | Shoe Joint                  |               |              |                     |               |  |
| <b>Comment</b>                                    |                  |                        |                 |                                  |                                   |                             |               |              |                     |               |  |

1.3 Job Overview

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|    |   | <b>Units</b> | <b>Description</b> |
|----|---|--------------|--------------------|
| 1  | Surface temperature at time of job            | °F           | 36                 |
| 2  | Mud type (OBM, WBM, SBM, Water, Brine)        | -            | WBM                |
| 3  | Actual mud density                            | lb/gal       | 12                 |
| 7  | Time circulated before job                    | HH:MM        | 3:00               |
| 10 | Pipe movement during hole circulation         | Y/N          | N                  |
| 14 | Calculated displacement                       | bbls         | 71                 |
| 15 | Job displaced by                              | Rig/HES      | HES                |
| 16 | Annular flow before job                       | Y/N          | N                  |
| 17 | Annular flow after job                        | Y/N          | N                  |
| 20 | Was lost circulation experienced at any time? | Y/N          | N                  |

1.4 Water Field Test

| Item             | Recorded Value | Units | Max Acceptable Limit | Potential Problems in Exceeding Limit   |
|------------------|----------------|-------|----------------------|---|
| pH               | 7              | -     | 6.0-8.0              | Chemicals in the water can cause severe retardation   |
| Chlorides        | 500            | ppm   | 3000 ppm             | Can shorten thickening time of cement   |
| Sulfates         | 200            | ppm   | 1500 ppm             | Will greatly decrease the strength of cement  |
| Total Hardness   |                | ppm   | 500 mg/L             | High concentrations will accelerate the set of the cement   |
| Calcium          |                | ppm   | 500 ppm              | High concentrations will accelerate the set of the cement   |
| Total Alkalinity |                | ppm   | 1000 ppm             | Cement is greatly retarded to the point where it may not set up at all (typically occurs @ pH $\geq$ 8.3).  |
| Bicarbonates     |                | ppm   | 1000 ppm             | Cement is greatly retarded to the point where it may not set up at all  |
| Potassium        |                | ppm   | 5000 ppm             | High concentrations will shorten the pump time of cement (indicates the presence of chlorides, therefore if Potassium levels are measured as high, so should the chlorides) |
| Iron             | 0              | ppm   | 300 ppm              | High concentrations will accelerate the set of the cement   |
| Temperature      | 75             | °F    | 50-80 °F             | High temps will accelerate; Low temps may risk freezing in cold weather   |

Submitted Respectfully by:

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## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

| Type  | Seq. No. | Activity                               | Graph Label                            | Date      | Time     | Source | DH Density (ppg) | PS Pump Press (psi) | PS Pump Rate (bbl/min) | Comments                                   |
|-------|----------|--|--|-----------|----------|--------|------------------|---------------------|------------------------|--|
| Event | 1        | Arrive at Location from Service Center | Arrive at Location from Service Center | 1/23/2015 | 22:30:00 | USER   |                  |                     |                        | Arrived on location rig ready for us       |
| Event | 2        | Assessment Of Location Safety Meeting  | Assessment Of Location Safety Meeting  | 1/23/2015 | 22:40:00 | USER   |                  |                     |                        | JSA and hazard hunt with HES crew          |
| Event | 3        | Rig-Up Equipment                       | Rig-Up Equipment                       | 1/23/2015 | 22:50:00 | USER   |                  |                     |                        | Rigged up HES lines and equipment          |
| Event | 4        | Other                                  | Other                                  | 1/24/2015 | 00:30:00 | USER   |                  |                     |                        | Waited for lab reports on the Cement       |
| Event | 5        | Pre-Job Safety Meeting                 | Pre-Job Safety Meeting                 | 1/24/2015 | 01:30:00 | USER   |                  |                     |                        | JSA with HES and rig crew on job procedure |
| Event | 6        | Start Job                              | Start Job                              | 1/24/2015 | 02:03:18 | COM6   | 8.16             | 8.00                | 0.00                   |  |
| Event | 7        | Test Lines                             | Test Lines                             | 1/24/2015 | 02:21:15 | COM6   | 9.69             | 27.00               | 0.00                   | Test lines to 3000psi                      |
| Event | 8        | Pump Spacer 1                          | Pump Spacer 1                          | 1/24/2015 | 02:25:24 | COM6   | 8.66             | 42.00               | 0.00                   | Pump 30bbls of 13ppg Spacer                |
| Event | 9        | Pump Lead Cement                       | Pump Lead Cement                       | 1/24/2015 | 02:35:07 | COM6   | 15.66            | 303.00              | 0.00                   | Pump 44bbls of 17.5ppg Cement              |
| Event | 10       | Pump Spacer 2                          | Pump Spacer 2                          | 1/24/2015 | 02:50:16 | COM6   | 13.95            | 70.00               | 0.00                   | Pump 5bbls of 13ppg Spacer                 |
| Event | 11       | Pump Displacement                      | Pump Displacement                      | 1/24/2015 | 02:51:01 | COM6   | 11.00            | 64.00               | 0.00                   | Pump 71bbls of Mud                         |
| Event | 12       | Release Drillpipe Pressure             | Release Drillpipe Pressure             | 1/24/2015 | 03:13:30 | USER   | 10.81            | 178.00              | 0.00                   | Released pressure got 3bbls of mud back    |
| Event | 13       | End Job                                | End Job                                | 1/24/2015 | 03:15:00 | COM6   | 10.85            | 3.00                | 0.00                   | Thank you Markovich and crew               |

## 3.0 Attachments

### 3.1 GP-DAIRY 1-20-19-Custom Results.png



