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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 **Buddy 7-16HZ** 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 Fort Lupton**

*The Road to Excellence Starts with Safety*

|   |                    |                                      |                            |
|---|--------------------|--------------------------------------|----------------------------|
| Sold To #: 300466                               | Ship To #: 3917333 | Quote #: 0022582137                  | Sales Order #: 0905706289  |
| Customer: ANADARKO PETROLEUM CORP-EBUS          |                    | Customer Rep: STEVE                  |                            |
| Well Name: BUDDY                                |                    | Well #: 7-16HZ                       | API/UWI #: 05-123-48459-00 |
| Field: WATTENBERG                               | City (SAP): IONE   | County/Parish: WELD                  | State: COLORADO            |
| Legal Description: NE NE-7-1N-67W-818FNL-975FEL |                    |                                      |                            |
| Contractor: PRECISION DRLG                      |                    | Rig/Platform Name/Num: PRECISION 464 |                            |
| Job BOM: 7523 7523                              |                    |                                      |                            |
| Well Type: HORIZONTAL GAS                       |                    |                                      |                            |
| Sales Person: HALAMERICA/HX41066                |                    | Srvc Supervisor: Lance Carpenter     |                            |

**Job**

|                               |             |  |                            |
|-------------------------------|-------------|--|----------------------------|
| <b>Formation Name</b>         |             |  |                            |
| <b>Formation Depth (MD)</b>   | <b>Top</b>  |  | <b>Bottom</b>              |
| <b>Form Type</b>              |             |  | <b>BHST</b>                |
| <b>Job depth MD</b>           | 18292ft     |  | <b>Job Depth TVD</b> 7603  |
| <b>Water Depth</b>            |             |  | <b>Wk Ht Above Floor</b> 4 |
| <b>Perforation Depth (MD)</b> | <b>From</b> |  | <b>To</b>                  |

**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            |        | J-55   | 0         | 1852         | 0          | 1852          |
| Casing            |            | 5.5     | 4.892 | 17            | LTC    | HCP110 | 0         | 18284        | 0          | 7603          |
| Open Hole Section |            |         | 7.875 |               |        |        | 1860      | 18292        | 1852       | 7603          |

**Tools and Accessories**

| Type         | Size in | Qty | Make | Depth ft | Type           | Size in | Qty | Make |
|--------------|---------|-----|------|----------|----------------|---------|-----|------|
| Guide Shoe   | 5.5     |     |      | 1852     | Top Plug       | 5.5     | 1   |      |
| Float Shoe   | 5.5     |     |      |          | Bottom Plug    | 5.5     | 1   |      |
| Float Collar | 5.5     |     |      |          | SSR plug set   | 5.5     |     |      |
| Insert Float | 5.5     |     |      |          | Plug Container | 5.5     | 1   | HES  |
| Stage Tool   | 5.5     |     |      |          | Centralizers   | 5.5     |     |      |

**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               | FDP-C1337-18 | SBM FDP-C1337-18 CEMENT SPACER SYS        | 80  | bbl     | 10.5                   | 6.17           | 39.6          |              |                     |  |
| 1 lbm/bbl       |              | <b>FE-2 (100001615)</b>                   |     |         |                        |                |               |              |                     |  |
| 0.75 gal/bbl    |              | <b>MUSOL(R) A, 5 GAL PAIL (100064220)</b> |     |         |                        |                |               |              |                     |  |

|               |   |
|---------------|---|
| 90.94 lbm/bbl | <b>BARITE, BULK (100003681)</b>                         |
| 0.75 gal/bbl  | <b>DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)</b> |
| 0.25 gal/bbl  | <b>D-AIR 3000L, 5 GAL PAIL (101007444)</b>              |

| Fluid #  | Stage Type | Fluid Name                                 | Qty | Qty UoM | Mixing Density<br>lbm/gal | Yield<br>ft3/sack | Mix Fluid<br>Gal | Rate<br>bbl/min | Total Mix<br>Fluid<br>Gal |
|----------|------------|--|-----|---------|---------------------------|-------------------|------------------|-----------------|---------------------------|
| 2        | Gasstop B1 | GASSTOP (TM) SYSTEM                        | 640 | sack    | 13.2                      | 1.56              | 7.72             | 6               | 7.72                      |
| 0.10 Gal |            | <b>D-AIR 3000L, 5 GAL PAIL (101007444)</b> |     |         |                           |                   |                  |                 |                           |
| 0.90 %   |            | <b>SCR-100 (100003749)</b>                 |     |         |                           |                   |                  |                 |                           |
| 5.12 Gal |            | <b>FRESH WATER</b>                         |     |         |                           |                   |                  |                 |                           |

| Fluid # | Stage Type | Fluid Name                             | Qty  | Qty UoM | Mixing Density<br>lbm/gal | Yield<br>ft3/sack | Mix Fluid<br>Gal | Rate<br>bbl/min | Total Mix<br>Fluid<br>Gal |
|---------|------------|--|------|---------|---------------------------|-------------------|------------------|-----------------|---------------------------|
| 3       | EconoCem   | ECONOCEM (TM) SYSTEM                   | 1110 | sack    | 13.5                      | 1.68              | 7.99             | 6               | 7.99                      |
| 0.10 %  |            | <b>SA-1015, 50 LB SACK (102077046)</b> |      |         |                           |                   |                  |                 |                           |
| 8 Gal   |            | <b>FRESH WATER</b>                     |      |         |                           |                   |                  |                 |                           |
| 0.31 %  |            | <b>HR-5, 50 LB SK (100005050)</b>      |      |         |                           |                   |                  |                 |                           |

| Fluid #      | Stage Type             | Fluid Name  | Qty | Qty UoM | Mixing Density<br>lbm/gal | Yield<br>ft3/sack | Mix Fluid<br>Gal | Rate<br>bbl/min | Total Mix<br>Fluid<br>Gal |
|--------------|------------------------|---|-----|---------|---------------------------|-------------------|------------------|-----------------|---------------------------|
| 4            | Biocide Water and MMCR | Biocide Water and MMCR                                      | 20  | bbl     | 8.34                      |                   |                  |                 |                           |
| 0.50 gal/bbl |                        | <b>MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)</b> |     |         |                           |                   |                  |                 |                           |

| Fluid # | Stage Type    | Fluid Name    | Qty | Qty UoM | Mixing Density<br>lbm/gal | Yield<br>ft3/sack | Mix Fluid<br>Gal | Rate<br>bbl/min | Total Mix<br>Fluid<br>Gal |
|---------|---------------|---------------|-----|---------|---------------------------|-------------------|------------------|-----------------|---------------------------|
| 5       | Biocide Water | Biocide Water | 404 | bbl     | 8.34                      |                   |                  |                 |                           |

|                            |               |                            |                      |                               |          |
|----------------------------|---------------|----------------------------|----------------------|-------------------------------|----------|
| <b>Cement Left In Pipe</b> | <b>Amount</b> | 4 ft                       | <b>Reason</b>        | <b>Shoe Joint</b>             |          |
| <b>Mix Water:</b>          | Ph7           | <b>Mix Water Chloride:</b> | 200ppm               | <b>Mix Water Temperature:</b> | 65°F °C  |
| <b>Cement Temperature:</b> | ## °F °C      | <b>Plug Displaced by:</b>  | ## lb/gal kg/m3 XXXX | <b>Disp. Temperature:</b>     | ## °F °C |
| <b>Plug Bumped?</b>        | Yes           | <b>Bump Pressure:</b>      | 2120 psi MPa         | <b>Floats Held?</b>           | Yes      |
| <b>Cement Returns:</b>     | ## bbl m3     | <b>Returns Density:</b>    | ## lb/gal kg/m3      | <b>Returns Temperature:</b>   | ## °F °C |

## Comment

JOB WENT WELL, CEMENT WAS WEIGHED AND VERRIFIED ON SCALES THROUGHOUT JOB, PUMPED 424 BBLS OF DISPLACEMENT WATER WITH MMCR IN THE FIRST 20BBLS AND BIOCIDE THROUGHOUT, CAUGHT PRESSURE AT 61 BBLS AWAY, SLOWED RATE TO 3BPM AT 395BBLS AWAY, BUMPED PLUG AND TOOK 500PSI OVER FINAL CIRCULATING PRESSURE 2120PSI. HELD FOR 5 MINS, OPENED UP WET SHOE SUB AT 4550PSI AND PUMPED 3 BBL WET SHOE. CHECKED FLOATS AND GOT 3.5 BBLS BACK.

TOP OF TAIL 7526'

TOP OF LEAD 1832'

TOP OF SPACER 162'

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

| Type  | Seq. No. | Activity                    | Graph Label                 | Date      | Time     | Source | Comments  |
|-------|----------|-----------------------------|-----------------------------|-----------|----------|--------|---|
| Event | 1        | Check Floats                | Call Out                    | 5/25/2019 | 03:00:00 | USER   | CREW CALLED OUT.  |
| Event | 2        | Crew Leave Yard             | Crew Leave Yard             | 5/25/2019 | 06:15:00 | USER   | AFTER CHECKING COLLECT CEMENT VOLUMES WERE LOADED AND EQUIPMENT WAS RUNNING, CREW HAD A PRE CONVOY SAFETY MEETING AND DISCUSSED SAFE FOLLING DISTANCES, WILD LIFE ON ROAD, AND ROUTE TO LOCATION. |
| Event | 3        | Arrive At Loc               | Arrive At Loc               | 5/25/2019 | 06:30:00 | USER   | CREW ARRIVED ON LOCATION, RIG WAS STILL RUNNING CASING WITH 4000' LEFT TO GO.   |
| Event | 4        | Safety Meeting - Pre Rig-Up | Safety Meeting - Pre Rig-Up | 5/25/2019 | 08:00:00 | USER   | HAD A PRE RIG UP SAFETY MEETING WITH CREW AND DISCUSSED 40' BUFFER ZONE, TEAM CARRY WITH IRON, SLIP TRIPS AND FALLS.  |
| Event | 5        | Start Mix                   | Start Mix                   | 5/25/2019 | 10:30:00 | USER   | CREW LANDED CASING ON BOTTOM, HES STARTED CIRCULATING LATEX.  |
| Event | 6        | Start Job                   | Start Job                   | 5/25/2019 | 10:38:51 | COM6   |   |

|       |    |                   |                   |           |          |      |   |
|-------|----|-------------------|-------------------|-----------|----------|------|---|
| Event | 7  | Safety Meeting    | Safety Meeting    | 5/25/2019 | 11:20:00 | USER | HAD A SAFETY MEETING WITH RIG CREW AND HES, DISCUSSED S.W.A, NEAREST HOSPITAL, MUSTER AREA, 3 POINTS OF CONTACT, SLIP, TRIPS AND FALLS, PRESSURE TESTING AND GOOD COMMUNICATION THROUGHOUT JOB. |
| Event | 8  | Prime Pumps       | Prime Pumps       | 5/25/2019 | 11:49:38 | COM6 |   |
| Event | 9  | Test Lines        | Test Lines        | 5/25/2019 | 11:53:13 | COM6 | PRESSURE TESTED HES LINES TO 6500PSI  |
| Event | 10 | Pump Spacer 1     | Pump Spacer 1     | 5/25/2019 | 11:57:07 | COM6 | PUMPED 80 BBLS OF FDP SPACER 10.5 PPG 6.17 YIELD 39.6 GAL   |
| Event | 11 | Drop Bottom Plug  | Drop Bottom Plug  | 5/25/2019 | 12:15:00 | USER | DROPPED BOTTOM PLUG WITH COMPANY MAN ON RIG FLOOR.  |
| Event | 12 | Pump Lead Cement  | Pump Lead Cement  | 5/25/2019 | 12:16:44 | COM6 | PUMPED 177 BBLS OF GASSTOP CEMENT 13.2 PPG 1.56 YIELD 7.72 GAL 640 SKS  |
| Event | 13 | Pump Tail Cement  | Pump Tail Cement  | 5/25/2019 | 12:48:19 | COM6 | PUMPED 332 BBLS OF ECNOCEM CEMENT 13.5 PPG 1.68 YIELD 7.99 GAL 1110 SKS   |
| Event | 14 | Clean Lines       | Clean Lines       | 5/25/2019 | 13:54:43 | COM6 | RIG BLEW DOWN LINES TO WASH UP TANK, HES WASHED PUMPS AND LINES.  |
| Event | 15 | Drop Top Plug     | Drop Top Plug     | 5/25/2019 | 14:00:52 | COM6 | DROPPED TOP PLUG WITH COMPANY MAN ON RIG FLOOR.   |
| Event | 16 | Pump Displacement | Pump Displacement | 5/25/2019 | 14:00:54 | COM6 | PUMPED 424 BBLS OF DISPLACEMENT WATER WITH MMCR IN THE FIRST 20BBLS AND BIOCIDES THROUGHOUT. CAUGHT PRESSURE AT 61 BBLS AWAY, SLOWED RATE TO 3BPM AT 395BBLS AWAY.                              |
| Event | 17 | Bump Plug         | Bump Plug         | 5/25/2019 | 14:57:59 | COM6 | FINAL CIRCULATING PRESSURE WAS 2120PSI TOOK 500PSI OVER TO BUMP. HELD FOR 5 MINS  |
| Event | 18 | Other             | Other             | 5/25/2019 | 15:05:01 | USER | OPENED UP WET SHOE SUB AT 4550PSI AND PUMPED 3 BBL WET SHOE.  |
| Event | 19 | Check Floats      | Check Floats      | 5/25/2019 | 15:05:50 | USER | CHECKED FLOATS, FLOATS HELD AND GOT 3.5 BBLS BACK.  |

|       |    |                               |                               |           |          |      |  |
|-------|----|-------------------------------|-------------------------------|-----------|----------|------|--|
| Event | 20 | End Job                       | End Job                       | 5/25/2019 | 15:07:42 | COM6 | END JOB  |
| Event | 21 | Safety Meeting - Pre Rig-Down | Safety Meeting - Pre Rig-Down | 5/25/2019 | 15:15:00 | USER | HAD A PRE RIG DOWN SAFETY MEETING WITH CREW AND DISCUSSED 40' BUFFER ZONE, TEAM CARRY WITH IRON, SLIP TRIPS AND FALLS, FOOTING PLACEMENT AND GOOD COMMUNICATION. |
| Event | 22 | Call Out                      | Crew Leave Location           | 5/25/2019 | 16:30:00 | USER | HAD A PRE CONVOY SAFETY MEETING WITH CREW AND DISCUSSED SAFE FOLLING DISTANCES WHILE DRIVING, WILD LIFE AND ROUTE ACK TO YARD.                                   |

## 3.0 Attachments

### 3.1 Job Chart

