

## Results of Directional Survey

DD

|             |                     |           |                               |
|-------------|---------------------|-----------|-------------------------------|
| API number: | <b>30-025-39858</b> |           |                               |
| OGRID:      |                     | Operator: | <b>COG OPERATING LLC</b>      |
|             |                     | Property: | <b>GC FEDERAL</b> # <b>43</b> |

|         |        |          |           |            |            |             |            |
|---------|--------|----------|-----------|------------|------------|-------------|------------|
| surface | ULSTR: | <b>N</b> | <b>20</b> | <b>T</b>   | <b>17S</b> | <b>R</b>    | <b>32E</b> |
|         |        |          |           | <b>380</b> | <b>FSL</b> | <b>1970</b> | <b>FWL</b> |

|             |           |               |            |            |            |             |            |
|-------------|-----------|---------------|------------|------------|------------|-------------|------------|
| BH Loc      | ULSTR:    | <b>N</b>      | <b>20</b>  | <b>T</b>   | <b>17S</b> | <b>R</b>    | <b>32E</b> |
| <b>7067</b> | <b>MD</b> | <b>7010.2</b> | <b>TVD</b> | <b>973</b> | <b>FSL</b> | <b>1663</b> | <b>FWL</b> |

|             |           |               |            |            |            |             |            |
|-------------|-----------|---------------|------------|------------|------------|-------------|------------|
| Top Perf/OH | ULSTR:    | <b>N</b>      | <b>20</b>  | <b>T</b>   | <b>17S</b> | <b>R</b>    | <b>32E</b> |
| <b>5400</b> | <b>MD</b> | <b>5346.5</b> | <b>TVD</b> | <b>885</b> | <b>FSL</b> | <b>1707</b> | <b>FWL</b> |

|             |           |               |            |            |            |             |            |
|-------------|-----------|---------------|------------|------------|------------|-------------|------------|
| Bot Perf/OH | ULSTR:    | <b>N</b>      | <b>20</b>  | <b>T</b>   | <b>17S</b> | <b>R</b>    | <b>32E</b> |
| <b>6780</b> | <b>MD</b> | <b>6723.8</b> | <b>TVD</b> | <b>955</b> | <b>FSL</b> | <b>1667</b> | <b>FWL</b> |

|              |             |        |         |         |
|--------------|-------------|--------|---------|---------|
|              | MD          | N/S    | E/W     | VD      |
|              | 5364        | 502.05 | -261.72 | 5310.67 |
| TOP PERFS/OH | <b>5400</b> | 505.38 | -263.50 | 5346.47 |
|              | 5459        | 510.85 | -266.42 | 5405.14 |
|              | 6760        | 573.40 | -302.23 | 6703.88 |
| BOT PERFS/OH | <b>6780</b> | 574.69 | -302.51 | 6723.84 |
|              | 6854        | 579.47 | -303.56 | 6797.68 |

|              |             |        |         |         |
|--------------|-------------|--------|---------|---------|
| NEXT TO LAST | 6947        | 585.38 | -304.93 | 6890.48 |
| LAST READING | 7017        | 589.71 | -305.94 | 6960.34 |
| TD           | <b>7067</b> | 592.80 | -306.66 | 7010.24 |

|                  |     |    |      |    |
|------------------|-----|----|------|----|
| Surface Location | 380 | FS | 1970 | FW |
| Projected BHL    | 973 | FS | 1663 | FW |
| Location of      |     |    |      |    |
| Top Perfs/OH     | 885 | FS | 1707 | FW |
| Bottom Perfs/OH  | 955 | FS | 1667 | FW |

### SUMMARY of Subsurface Locations

|                  |              |     |    |      |    |             |
|------------------|--------------|-----|----|------|----|-------------|
| Surface Location | N-20-17S-32E | 380 | FS | 1970 | FW | Vert. Depth |
|                  |              |     |    |      |    |             |
| Top Perfs/OH     | N-20-17S-32E | 885 | FS | 1707 | FW | 5346.47     |
| Bottom Perfs/OH  | N-20-17S-32E | 955 | FS | 1667 | FW | 6723.84     |
|                  |              |     |    |      |    |             |
| Projected TD     | N-20-17S-32E | 973 | FS | 1663 | FW | 7010.24     |