**Marc A. Downing**

**Consulting Petroleum Geologist**

# Geologic Report

**Drilling Time and Sample Log**

| | | | |
|---|---|---|---|
| Operator | **H&C Oil Operating, Inc.** | Elevation | |
| | | KB | **2088** |
| Lease | **Newell** | No. **23-2** | DF **2086** |
| | | | GL **2080** |
| API # | **15-065-24053-0000** | Casing Record | |
| | | Surface | **8 5/8" @ 221'** |
| Field | **Wildcat** | Production | **5 1/2" @ 3619'** |
| Location | **600' FSL & 2550' FEL** | Electrical Surveys | **CNL/CDL, DIL, MEL** |
| Sec. **23** | Twp. **8s** | Rge. **21w** | |
| County **Graham** | State **Kansas** | | |

| Formation | Sample tops | Log Tops | Datum | Struct Comp |
|---|---|---|---|---|
| Top Anhydrite | 1607 | 1606 | +482 | +5 |
| Base Anhydrite | 1640 | 1639 | +449 | +3 |
| | | | | |
| Topeka | 3066 | 3063 | -975 | +3 |
| Heebner | 3276 | 3275 | -1187 | +4 |
| Toronto | 3300 | 3297 | -1209 | +5 |
| LKC | 3314 | 3313 | -1225 | +5 |
| BKC | 3534 | 3531 | -1443 | +5 |
| Marmaton | 3563 | 3561 | -1473 | +3 |
| Arbuckle | 3615 | NA | -1527 | +12 |
| | | | | |
| Total Depth | 3621 | 3621 | -1533 | |

Reference Well For Structural Comparison **H&C Oil Operating**
**Newell #23-1** **330' FSL & 1850' FEL** **Sec. 23-8s-21w**

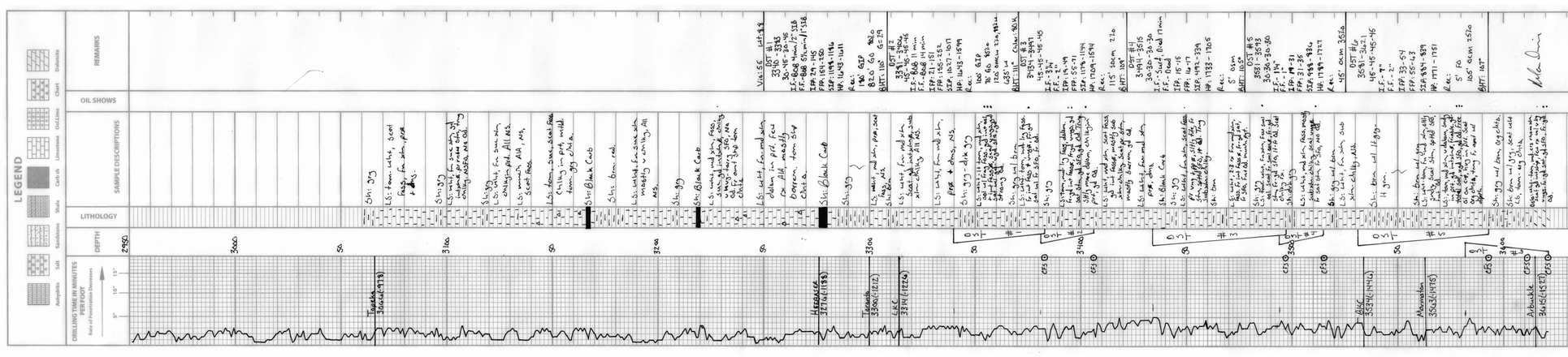
| | | | |
|---|---|---|---|
| Drilling Contractor | **Discovery Drilling, Rig #1** | | |
| Commenced | **7-21-14** | Completed | **7-28-14** |
| Samples Saved From | **3050** | To | **RTD** |
| Drilling Time Kept From | **2950** | To | **RTD** |
| Samples Examined From | **3050** | To | **RTD** |
| Geological Supervision From | **2950** | To | **RTD** |

## Summary and Recommendations

**Due to structural position, DST recovery, and log evaluation, it was decided to set 5 1/2" production casing for completion.**

**Perforate:**

**LKC J: 3484-3489**
**LKC I: 3469-3472**
**LKC C: 3352-3357**
**LKC F: 3398-3400 (Before Abandonment)**
**Marmaton: 3563-3572 (Before Abandonment)**

Respectfully Submitted,

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