KOLAR Document ID: 1765190

KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

Form U3C
June 2015
**Form must be Typed**
**Form must be completed on a per well basis**

# ANNUAL REPORT OF PRESSURE MONITORING, FLUID INJECTION AND ENHANCED RECOVERY

***Complete all blanks - add pages if needed. Copy to be retained for five (5) years after filing date.***

OPERATOR: License # 7311
Name: Shakespeare Oil Co., Inc.
Address 1: 202 W MAIN ST
Address 2:
City: SALEM State: IL Zip: 62881 + 1519
Contact Person: Joseph McDanel
Phone: ( 618 ) 548-1585
Lease Name: CAMPBELL
Well Number: 2-8

API No.: 15-109-20948-00-00
Permit No: D30729.0
Reporting Year: 2023
*(January 1 to December 31)*

SW - SE - SW - NE (Q/Q/Q/Q) Sec. 8 Twp. 13 S. R. 32 ☐ E ☑ W
2685 feet from ☐ N / ☑ S Line of Section
1804 feet from ☑ E / ☐ W Line of Section
County: Logan

**I. Injection Fluid:**

Type *(Pick one)*: ☐ Fresh Water ☐ Treated Brine ☐ Untreated Brine ☑ Water/Brine
Source: ☑ Produced Water ☐ Other *(Attach list)*
Quality: Total Dissolved Solids: 93743 mg/l Specific Gravity: 1.059 Additives:
*(Attach water analysis, if available)*

**II. Well Data:**

Maximum Authorized Injection Pressure: 0 psi Injection Zone: ARBUCKLE
Maximum Authorized Injection Rate: 500 barrels per day
Total Number of Enhanced Recovery Injection Wells Covered by this Permit: _____ *(Include TA's)*

**III.**

| Month: | Total Fluid Injected BBL | Maximum Fluid Pressure | Total Gas Injected MCF | Maximum Gas Pressure | # Days of Injection |
|---|---|---|---|---|---|
| January | 6261 | 0 | 0 | 0 | 31 |
| February | 6041 | 0 | 0 | 0 | 28 |
| March | 6052 | 0 | 0 | 0 | 31 |
| April | 6344 | 0 | 0 | 0 | 30 |
| May | 6104 | 0 | 0 | 0 | 31 |
| June | 6331 | 0 | 0 | 0 | 30 |
| July | 6062 | 0 | 0 | 0 | 31 |
| August | 6357 | 0 | 0 | 0 | 31 |
| September | 6348 | 0 | 0 | 0 | 30 |
| October | 6025 | 0 | 0 | 0 | 31 |
| November | 6271 | 0 | 0 | 0 | 30 |
| December | 6299 | 0 | 0 | 0 | 31 |
| ***TOTAL*** | 74495 | | 0 | | |

Submitted Electronically

Baker Hughes

**Central Area Laboratory**
12701 N. Santa Fe Ave, Suite 151
Oklahoma City, Oklahoma 73114

Upstream Chemicals

**REPORT DATE:** 2/28/2024

# COMPLETE WATER ANALYSIS REPORT SSP v.2010

| | | | |
|---|---|---|---|
| **CUSTOMER:** | SHAKESPEARE OIL | **ACCOUNT REP:** | BRETT J SUTER |
| **DISTRICT:** | KANSAS | **SAMPLE ID:** | 202410001358 |
| **AREA/LEASE:** | CAMPBELL | **SAMPLE DATE:** | 2/9/2024 |
| **SAMPLE POINT NAME** | CAMPBELL 2-8 | **ANALYSIS DATE:** | 2/23/2024 |
| **SITE TYPE:** | WELL SITES | **ANALYST:** | BS |
| **SAMPLE POINT DESCRIPTION:** | WELL HEAD | | |
| **CUSTOMER SAMPLE POINT ID:** | | | |

## SHAKESPEARE OIL, CAMPBELL, CAMPBELL 2-8

| FIELD DATA | |
|---|---|
| **Initial Temperature (°F):** | 150 |
| **Final Temperature (°F):** | 50 |
| **Initial Pressure (psi):** | 100 |
| **Final Pressure (psi):** | 15 |
| **pH:** | |
| **pH at time of sampling:** | 6.9 |

| ALKALINITY BY TITRATION: | mg/L | meq/L |
|---|---|---|
| **Bicarbonate ($HCO_3^-$):** | 450.0 | 7.4 |
| **Carbonate ($CO_3^{2-}$):** | ND | |
| **Hydroxide ($OH^-$):** | ND | |

| | |
|---|---|
| **aqueous $CO_2$ (ppm):** | 120.0 |
| **aqueous $H_2S$ (ppm):** | 15.0 |
| **aqueous O2 (ppb):** | ND |
| **Calculated TDS (mg/L):** | 93743 |
| **Density/Specific Gravity (g/cm³):** | 1.0590 |
| **Measured Specific Gravity** | ND |
| **Conductivity (mmhos):** | ND |
| **Resistivity:** | ND |
| **MCF/D:** | No Data |
| **BOPD:** | No Data |
| **BWPD:** | No Data |

| ANALYSIS OF SAMPLE — ANIONS: | mg/L | meq/L |
|---|---|---|
| **Chloride ($Cl^-$):** | 55376.0 | 1562.1 |
| **Sulfate ($SO_4^{2-}$):** | 3557.0 | 74.1 |
| **Borate ($H_3BO_3$):** | 210.4 | 3.4 |
| **Fluoride ($F^-$):** | ND | |
| **Bromide ($Br^-$):** | ND | |
| **Nitrite ($NO_2^-$):** | ND | |
| **Nitrate ($NO_3^-$):** | ND | |
| **Phosphate ($PO_4^{3-}$):** | 0.1 | 0.0 |
| **Silica ($SiO_2$):** | ND | |

| ORGANIC ACIDS: | mg/L | meq/L |
|---|---|---|
| **Formic Acid:** | ND | |
| **Acetic Acid:** | ND | |
| **Propionic Acid:** | ND | |
| **Butyric Acid:** | ND | |
| **Valeric Acid:** | ND | |

| CATIONS: | mg/L | meq/L |
|---|---|---|
| **Sodium ($Na^+$):** | 32004.1 | 1392.7 |
| **Potassium ($K^+$):** | 427.8 | 10.9 |
| **Magnesium ($Mg^{2+}$):** | 482.1 | 39.7 |
| **Calcium ($Ca^{2+}$):** | 1375.9 | 68.7 |
| **Strontium ($Sr^{2+}$):** | 69.0 | 1.6 |
| **Barium ($Ba^{2+}$):** | 0.3 | 0.0 |
| **Iron ($Fe^{2+}$):** | 0.5 | 0.0 |
| **Manganese ($Mn^{2+}$):** | 0.1 | 0.0 |
| **Lead ($Pb^{2+}$):** | ND | |
| **Zinc ($Zn^{2+}$):** | 0.3 | 0.0 |
| **Aluminum ($Al^{3+}$):** | ND | |
| **Chromium ($Cr^{3+}$):** | ND | |
| **Cobalt ($Co^{2+}$):** | ND | |
| **Copper ($Cu^{2+}$):** | ND | |
| **Molybdenum ($Mo^{2+}$):** | ND | |
| **Nickel ($Ni^{2+}$):** | ND | |
| **Tin ($Sn^{2+}$):** | ND | |
| **Titanium ($Ti^{2+}$):** | ND | |
| **Vanadium ($V^{2+}$):** | ND | |
| **Zirconium ($Zr^{2+}$):** | ND | |
| **Lithium (Li):** | ND | |
| **Total Hardness:** | 5505 | N/A |

**Anion/Cation Ratio:** 1.09

**ND = Not Determined**

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

| Conditions | | Barite ($BaSO_4$) | | Calcite ($CaCO_3$) | | Gypsum ($CaSO_4 \cdot 2H_2O$) | | Anhydrite ($CaSO_4$) | |
|---|---|---|---|---|---|---|---|---|---|
| **Temp** | **Press.** | **Index** | **Amt (ptb)** | **Index** | **Amt (ptb)** | **Index** | **Amt (ptb)** | **Index** | **Amt (ptb)** |
| 50°F | 15 psi | 1.00 | 0.178 | 0.50 | 41.560 | -0.25 | 0.000 | -0.56 | 0.000 |
| 61°F | 24 psi | 0.90 | 0.173 | 0.52 | 43.629 | -0.23 | 0.000 | -0.51 | 0.000 |
| 72°F | 34 psi | 0.80 | 0.167 | 0.57 | 47.262 | -0.23 | 0.000 | -0.46 | 0.000 |
| 83°F | 43 psi | 0.72 | 0.159 | 0.62 | 51.312 | -0.22 | 0.000 | -0.41 | 0.000 |
| 94°F | 53 psi | 0.63 | 0.151 | 0.68 | 55.424 | -0.22 | 0.000 | -0.36 | 0.000 |
| 106°F | 62 psi | 0.56 | 0.143 | 0.75 | 60.011 | -0.21 | 0.000 | -0.31 | 0.000 |
| 117°F | 72 psi | 0.48 | 0.133 | 0.82 | 64.435 | -0.21 | 0.000 | -0.25 | 0.000 |
| 128°F | 81 psi | 0.42 | 0.122 | 0.88 | 68.553 | -0.20 | 0.000 | -0.20 | 0.000 |
| 139°F | 91 psi | 0.36 | 0.111 | 0.95 | 72.392 | -0.20 | 0.000 | -0.14 | 0.000 |
| 150°F | 100 psi | 0.30 | 0.100 | 1.01 | 75.978 | -0.19 | 0.000 | -0.08 | 0.000 |

| Conditions | | Celestite ($SrSO_4$) | | Halite (NaCl) | | Iron Sulfide (FeS) | | Iron Carbonate ($FeCO_3$) | |
|---|---|---|---|---|---|---|---|---|---|
| **Temp** | **Press.** | **Index** | **Amt (ptb)** | **Index** | **Amt (ptb)** | **Index** | **Amt (ptb)** | **Index** | **Amt (ptb)** |
| 50°F | 15 psi | 0.17 | 16.219 | -1.56 | 0.000 | 1.10 | 0.235 | -1.41 | 0.000 |
| 61°F | 24 psi | 0.17 | 16.465 | -1.57 | 0.000 | 0.99 | 0.229 | -1.35 | 0.000 |
| 72°F | 34 psi | 0.18 | 16.639 | -1.58 | 0.000 | 0.94 | 0.226 | -1.26 | 0.000 |
| 83°F | 43 psi | 0.18 | 16.784 | -1.59 | 0.000 | 0.90 | 0.223 | -1.18 | 0.000 |
| 94°F | 53 psi | 0.18 | 16.935 | -1.60 | 0.000 | 0.88 | 0.221 | -1.09 | 0.000 |
| 106°F | 62 psi | 0.18 | 17.126 | -1.60 | 0.000 | 0.87 | 0.221 | -1.00 | 0.000 |
| 117°F | 72 psi | 0.19 | 17.382 | -1.61 | 0.000 | 0.88 | 0.221 | -0.91 | 0.000 |
| 128°F | 81 psi | 0.19 | 17.726 | -1.61 | 0.000 | 0.88 | 0.222 | -0.82 | 0.000 |
| 139°F | 91 psi | 0.20 | 18.171 | -1.62 | 0.000 | 0.89 | 0.222 | -0.74 | 0.000 |
| 150°F | 100 psi | 0.20 | 18.727 | -1.62 | 0.000 | 0.90 | 0.223 | -0.67 | 0.000 |

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered

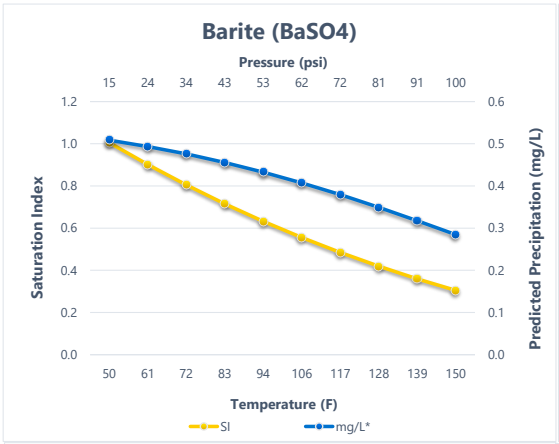
Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

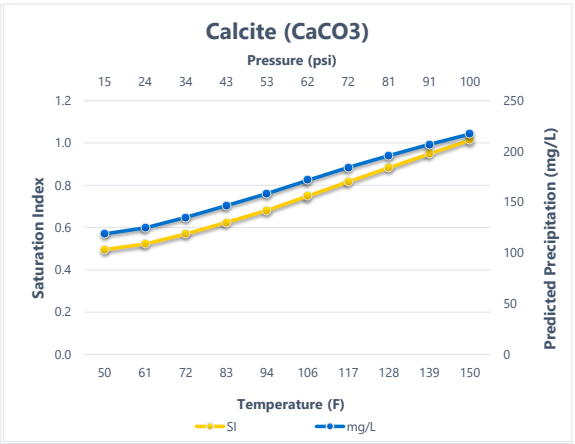
Note 3: Saturation Index predictions on this sheet use pH and alkalinity; $\%CO_2$ is not included in the calculations.

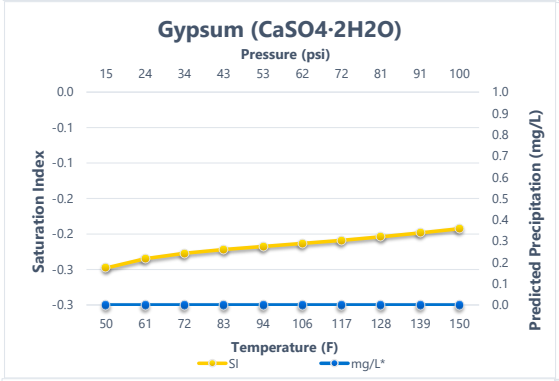
EESI ScaleSoftPitzer™ SSP2010

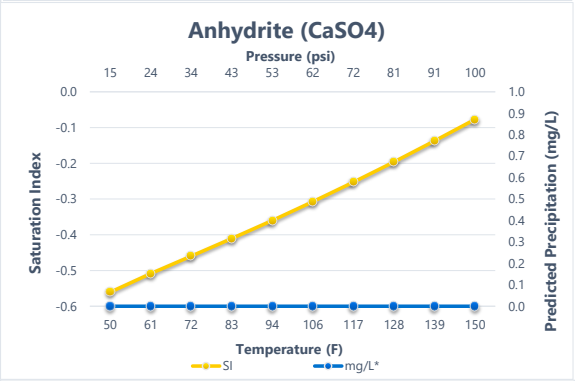
Comments:

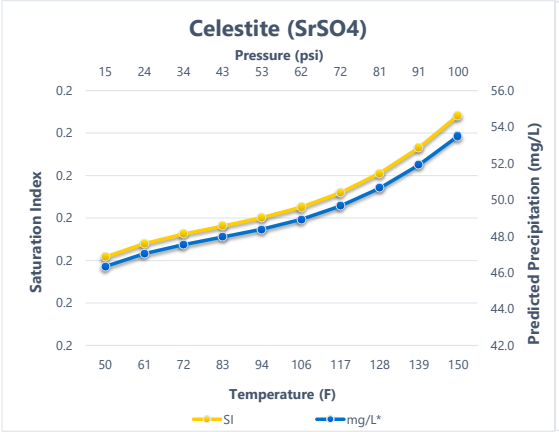
**SAMPLE ID: 202410001358 SHAKESPEARE OIL, CAMPBELL, CAMPBELL 2-8**

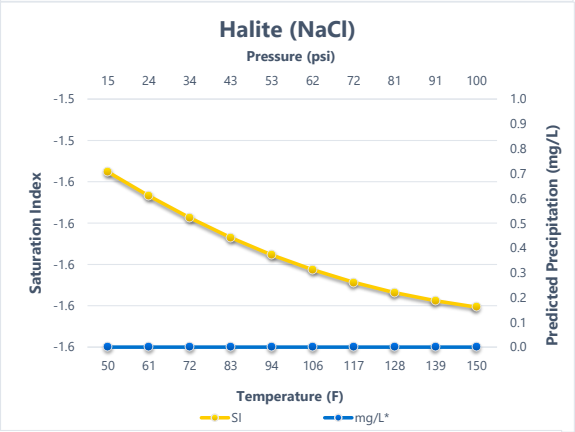


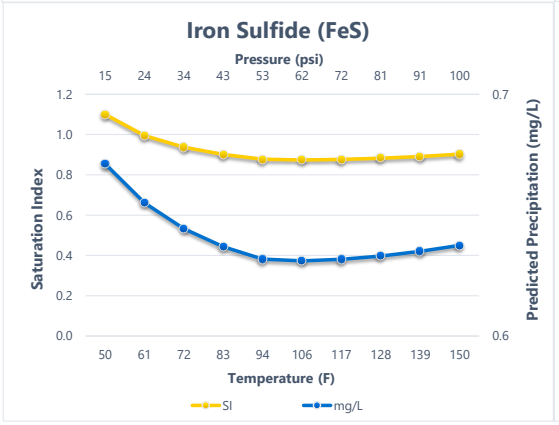



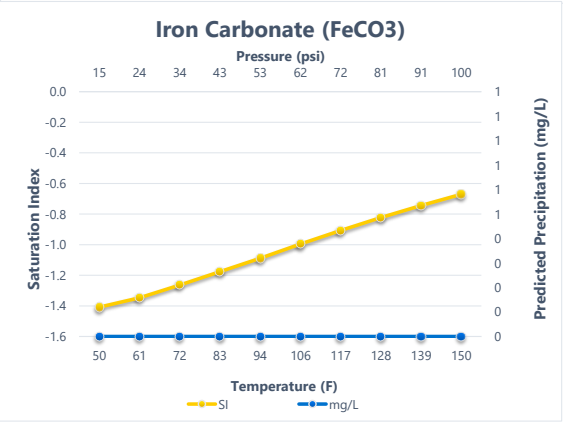




SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.