

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 # _____
Name: _____
Address 1: _____
Address 2: _____
City: _____ State: _____ Zip: _____ + _____
Contact Person: _____
Phone: (_____) _____
Lease Name: _____
Well Number: _____

API No.: _____
Permit No.: _____
Reporting Year: _____
(January 1 to December 31)
____ - ____ - ____ - ____ Sec. ____ Twp. ____ S. R. ____ E W
(a/a/a/a)
_____ feet from N / S Line of Section
_____ feet from E / W Line of Section
County: _____

I. Injection Fluid:

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

II. Well Data:

Maximum Authorized Injection Pressure: _____ psi Injection Zone: _____
Maximum Authorized Injection Rate: _____ 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 | _____ | _____ | _____ | _____ | _____ |
| | February | _____ | _____ | _____ | _____ | _____ |
| | March | _____ | _____ | _____ | _____ | _____ |
| | April | _____ | _____ | _____ | _____ | _____ |
| | May | _____ | _____ | _____ | _____ | _____ |
| | June | _____ | _____ | _____ | _____ | _____ |
| | July | _____ | _____ | _____ | _____ | _____ |
| | August | _____ | _____ | _____ | _____ | _____ |
| | September | _____ | _____ | _____ | _____ | _____ |
| | October | _____ | _____ | _____ | _____ | _____ |
| | November | _____ | _____ | _____ | _____ | _____ |
| | December | _____ | _____ | _____ | _____ | _____ |
| | TOTAL | _____ | _____ | _____ | _____ | _____ |



LINN OPERATING
JEFF SULLIVAN
FINNEY KS

OLOMAN SWDW
WELLHEAD

Report Date: 01-02-2019 Sampled: 12-17-2018
Sample #: 3076 at 0000
Sample ID: 208792

CATIONS

| | |
|-------------------------------|--------|
| Calcium (as Ca) | 10060 |
| Magnesium (as Mg) | 2956 |
| Barium (as Ba) | 0.237 |
| Strontium (as Sr) | 239.80 |
| Sodium (as Na) | 61638 |
| Potassium (as K) | 731.10 |
| Lithium (as Li) | 9.69 |
| Ammonia (as NH ₃) | 0.00 |
| Aluminum (as Al) | 0.00 |
| Iron (as Fe) | 8.24 |
| Manganese (as Mn) | 0.464 |
| Zinc (as Zn) | 0.256 |
| Lead (as Pb) | 0.00 |

ANIONS

| | |
|---|--------|
| Chloride (as Cl) | 135200 |
| Sulfate (as SO ₄) | 875.00 |
| Bromine (as Br) | 0.00 |
| Dissolved CO ₂ (as CO ₂) | 110.00 |
| Bicarbonate (as HCO ₃) | 42.70 |
| Carbonate (as CO ₃) | 0.00 |
| Oxalic acid (as C ₂ O ₄) | 0.00 |
| Silica (as SiO ₂) | 0.00 |
| Phosphate(as PO ₄) | 0.00 |
| H ₂ S (as H ₂ S) | 5.00 |
| Fluoride (as F) | 0.00 |
| Nitrate (as NO ₃) | 0.00 |
| Boron (as B) | 37.80 |

PARAMETERS

| | |
|------------------------|---------|
| Calculated T.D.S. | 203104 |
| Molar Conductivity | 346394 |
| Resistivity | 2.89 |
| Sp.Gr.(g/mL) | 1.14 |
| Pressure(atm) | 1.00 |
| pCO ₂ (atm) | 0.00235 |
| pH ₂ S(atm) | 0.00350 |
| Temperature (°F) | 58.40 |
| pH | 7.05 |

COMMENTS

FINNEY KS



LINN OPERATING
JEFF SULLIVAN
FINNEY KS

OLOMAN SWDW
WELLHEAD

Report Date: 01-02-2019 Sampled: 12-17-2018
Sample #: 3076 at 0000

Sample ID: 208792

SATURATION LEVEL

| | |
|--|---------|
| Calcite (CaCO ₃) | 0.657 |
| Aragonite (CaCO ₃) | 0.581 |
| Witherite (BaCO ₃) | < 0.001 |
| Strontianite (SrCO ₃) | 0.0158 |
| Calcium oxalate (CaC ₂ O ₄) | 0.00 |
| Magnesite (MgCO ₃) | 0.198 |
| Anhydrite (CaSO ₄) | 0.495 |
| Gypsum (CaSO ₄ *2H ₂ O) | 0.676 |
| Barite (BaSO ₄) | 0.470 |
| Celestite (SrSO ₄) | 0.235 |
| Fluorite (CaF ₂) | 0.00 |
| Calcium phosphate | 0.00 |
| Hydroxyapatite | 0.00 |
| Silica (SiO ₂) | 0.00 |
| Brucite (Mg(OH) ₂) | < 0.001 |
| Magnesium silicate | 0.00 |
| Iron hydroxide (Fe(OH) ₃) | < 0.001 |
| Strengite (FePO ₄ *2H ₂ O) | 0.00 |
| Siderite (FeCO ₃) | 0.223 |
| Halite (NaCl) | 0.182 |
| Thenardite (Na ₂ SO ₄) | < 0.001 |
| Iron sulfide (FeS) | 5.05 |

MOMENTARY EXCESS (Lbs/1000 Barrels)

| | |
|--|----------|
| Calcite (CaCO ₃) | -0.00307 |
| Aragonite (CaCO ₃) | -0.00426 |
| Witherite (BaCO ₃) | -26.42 |
| Strontianite (SrCO ₃) | -0.541 |
| Calcium oxalate (CaC ₂ O ₄) | -0.00377 |
| Magnesite (MgCO ₃) | -0.0202 |
| Anhydrite (CaSO ₄) | -89.98 |
| Gypsum (CaSO ₄ *2H ₂ O) | -48.00 |
| Barite (BaSO ₄) | -0.158 |
| Celestite (SrSO ₄) | -153.25 |
| Fluorite (CaF ₂) | -1.92 |
| Calcium phosphate | >-0.001 |
| Hydroxyapatite | -248.16 |
| Silica (SiO ₂) | -22.93 |
| Brucite (Mg(OH) ₂) | 0.00154 |
| Magnesium silicate | -80.48 |
| Iron hydroxide (Fe(OH) ₃) | < 0.001 |
| Strengite (FePO ₄ *2H ₂ O) | >-0.001 |
| Siderite (FeCO ₃) | -0.0236 |
| Halite (NaCl) | -82643 |
| Thenardite (Na ₂ SO ₄) | -87011 |
| Iron sulfide (FeS) | 0.422 |

SIMPLE INDICES

| | |
|--------------------|--------|
| Langelier | 0.592 |
| Ryznar | 5.87 |
| Puckorius | 6.43 |
| Larson-Skold Index | 7896 |
| Stiff Davis Index | 0.381 |
| Oddo-Tomson | -0.546 |

BOUND IONS

| | |
|-----------|--------|
| Calcium | 10060 |
| Barium | 0.237 |
| Carbonate | 1.74 |
| Phosphate | 0.00 |
| Sulfate | 875.00 |

TOTAL

FREE

OPERATING CONDITIONS

| | |
|------------------|-------|
| Temperature (°F) | 58.40 |
| Time(secs) | 0.00 |

DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

SYSTEM IDENTIFICATION

LINN OPERATING
OLOMAN SWDW
JEFF SULLIVAN
WELLHEAD
FINNEY KS

Sample ID#: 3076
ID: 208792
Report Date: 01-02-2019
Sample Date: 12-17-2018
at 0000

WATER CHEMISTRY

CATIONS

| | |
|------------------------------|--------|
| Calcium(as Ca) | 10060 |
| Magnesium(as Mg) | 2956 |
| Barium(as Ba) | 0.237 |
| Strontium(as Sr) | 239.80 |
| Sodium(as Na) | 61638 |
| Potassium(as K) | 731.10 |
| Lithium(as Li) | 9.69 |
| Iron(as Fe) | 8.24 |
| Field Iron(as Fe) | 15.00 |
| Ammonia(as NH ₃) | 0.00 |
| Aluminum(as Al) | 0.00 |
| Manganese(as Mn) | 0.464 |
| Zinc(as Zn) | 0.256 |
| Lead(as Pb) | 0.00 |

ANIONS

| | |
|---|--------|
| Chloride(as Cl) | 135200 |
| Sulfate(as SO ₄) | 875.00 |
| Bromine(as Br) | 0.00 |
| Dissolved CO ₂ (as CO ₂) | 110.00 |
| Bicarbonate(as HCO ₃) | 42.70 |
| Carbonate(as CO ₃) | 0.00 |
| Silica(as SiO ₂) | 0.00 |
| Phosphate(as PO ₄) | 0.00 |
| H ₂ S (as H ₂ S) | 5.00 |
| Fluoride(as F) | 0.00 |
| Nitrate(as NO ₃) | 0.00 |
| Boron(as B) | 37.80 |

PARAMETERS

| | |
|-----------------|--------|
| Temperature(°F) | 58.40 |
| T.D.S. | 203104 |
| Resistivity: | 2.89 |
| Sample pH | 7.05 |
| Conductivity: | 346394 |

SCALE AND CORROSION POTENTIAL

| Temp. (°F) | Press. (atm) | Calcite CaCO ₃ | | Anhydrite CaSO ₄ | | Gypsum CaSO ₄ *2H ₂ O | | Barite BaSO ₄ | | Celestite SrSO ₄ | | Siderite FeCO ₃ | | Mackawenite FeS | | CO ₂ (mpy) | pCO ₂ (atm) |
|------------|--------------|---------------------------|----------------------|-----------------------------|----------------------|---|----------------------|--------------------------|----------------------|-----------------------------|----------------------|----------------------------|----------------------|-----------------|----------------------|-----------------------|------------------------|
| 50.00 | 0.00 | 0.562 | -0.00420 | 0.529 | -81.80 | 0.733 | -38.06 | 0.624 | -0.0844 | 0.257 | -143.60 | 0.180 | -0.0284 | 25.95 | 0.658 | 0.0213 | 0.00235 |
| 65.45 | 0.00 | 0.739 | -0.00221 | 0.474 | -94.39 | 0.635 | -55.61 | 0.375 | -0.233 | 0.222 | -158.72 | 0.264 | -0.0201 | 21.09 | 0.638 | 0.0399 | 0.00235 |
| 80.91 | 0.00 | 0.916 | >-0.001 | 0.449 | -96.70 | 0.562 | -69.98 | 0.240 | -0.443 | 0.204 | -164.74 | 0.365 | -0.0140 | 17.16 | 0.615 | 0.0134 | 0.00235 |
| 96.36 | 0.00 | 1.07 | < 0.001 | 0.449 | -90.43 | 0.507 | -81.24 | 0.162 | -0.720 | 0.194 | -165.71 | 0.470 | -0.00955 | 14.02 | 0.588 | 0.0168 | 0.00235 |
| 111.82 | 0.00 | 1.16 | 0.00103 | 0.469 | -78.02 | 0.500 | -78.01 | 0.115 | -1.07 | 0.188 | -164.55 | 0.564 | -0.00655 | 11.53 | 0.559 | 0.0165 | 0.00235 |
| 127.27 | 0.00 | 1.20 | 0.00118 | 0.511 | -62.05 | 0.523 | -66.95 | 0.0825 | -1.54 | 0.181 | -164.06 | 0.637 | -0.00463 | 9.57 | 0.527 | 0.0135 | 0.00235 |
| 142.73 | 0.00 | 1.18 | < 0.001 | 0.578 | -44.77 | 0.543 | -58.44 | 0.0600 | -2.15 | 0.174 | -164.42 | 0.677 | -0.00354 | 8.01 | 0.493 | 0.0111 | 0.00235 |
| 158.18 | 0.00 | 1.10 | < 0.001 | 0.676 | -27.92 | 0.560 | -51.88 | 0.0441 | -2.95 | 0.166 | -165.60 | 0.680 | -0.00308 | 6.72 | 0.456 | 0.0122 | 0.00235 |
| 173.64 | 0.00 | 0.976 | >-0.001 | 0.815 | -12.61 | 0.573 | -46.85 | 0.0327 | -3.98 | 0.159 | -167.56 | 0.649 | -0.00302 | 5.66 | 0.416 | 0.0134 | 0.00235 |
| 189.09 | 0.00 | 0.839 | >-0.001 | 1.01 | 0.567 | 0.584 | -43.04 | 0.0245 | -5.27 | 0.151 | -170.32 | 0.593 | -0.00319 | 4.75 | 0.374 | 0.00677 | 0.00235 |
| 204.55 | 0.00 | 0.702 | -0.00139 | 1.28 | 11.47 | 0.592 | -40.19 | 0.0186 | -6.87 | 0.144 | -173.88 | 0.522 | -0.00347 | 3.97 | 0.329 | 0.00567 | 0.00235 |
| 220.00 | 0.171 | 0.558 | -0.00210 | 1.66 | 20.56 | 0.594 | -39.91 | 0.0141 | -8.91 | 0.136 | -182.26 | 0.433 | -0.00402 | 3.71 | 0.299 | 0.00773 | 0.00275 |
| | | xSAT | Lbs per 1000 Barrels | xSAT | Lbs per 1000 Barrels | xSAT | Lbs per 1000 Barrels | xSAT | Lbs per 1000 Barrels | xSAT | Lbs per 1000 Barrels | xSAT | Lbs per 1000 Barrels | xSAT | Lbs per 1000 Barrels | | |

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase. Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.

