

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<br>BBL | Maximum Fluid<br>Pressure | Total Gas Injected<br>MCF | Maximum Gas<br>Pressure | # Days of<br>Injection |
|------|--------------|-----------------------------|---------------------------|---------------------------|-------------------------|------------------------|
|      | January      | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | February     | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | March        | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | April        | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | May          | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | June         | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | July         | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | August       | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | September    | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | October      | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | November     | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | December     | _____                       | _____                     | _____                     | _____                   | _____                  |
|      | <b>TOTAL</b> | _____                       | _____                     | _____                     | _____                   | _____                  |

Submitted Electronically



Location/Laboratory  
Address  
City, State, Zip

Report Date: 2/20/2019

### Complete Water Analysis Report SSP v.8

|                   |                     |                |              |
|-------------------|---------------------|----------------|--------------|
| Customer:         | Great Plains Energy | Sample Date:   | 2/20/2019    |
| District:         |                     | Log Out Date:  |              |
| Area:             | Oberlin,ks          | Sample ID:     |              |
| Lease:            | Sauvage #2 SWD      | Analyst:       | Greg Pollnow |
| Sample Point Name | Tank to Disposal    | Chemical Used: |              |
| Sales Rep:        | Greg Pollnow        | Comments:      |              |

#### Great Plains Energy, Sauvage #2 SWD, Tank to Disposal

| Field Data                        |        | Analysis of Sample  |             |        |                    |       |        |
|-----------------------------------|--------|---------------------|-------------|--------|--------------------|-------|--------|
|                                   |        | Anions:             |             | mg/L   |                    | meq/L |        |
| Initial Temperature (°F):         | 44     | Chloride (Cl⁻):     | 51250       | 1443.7 | Sodium (Na⁺):      | 28844 | 1259.6 |
| Final Temperature (°F):           | 100    | Sulfate (SO₄²⁻):    | 725         | 15.1   | Potassium (K⁺):    | 0     | 0.0    |
| Initial Pressure (psi):           | 1      | Borate (H₃BO₃):     | 0.0         | 0.0    | Magnesium (Mg²⁺):  | 486   | 40.0   |
| Final Pressure (psi):             | 25     | Fluoride (F⁻):      | 0.0         | 0.0    | Calcium (Ca²⁺):    | 3300  | 164.7  |
|                                   |        | Bromide (Br⁻):      | 0.0         | 0.0    | Strontium (Sr²⁺):  | 0     | 0.0    |
| pH:                               |        | Nitrite (NO₂⁻):     | 0.0         | 0.0    | Barium (Ba²⁺):     | 0.0   | 0.0    |
| pH at time of sampling:           | 6.3    | Nitrate (NO₃⁻):     | 0.0         | 0.0    | Iron (Fe²⁺):       | 32.0  | 1.1    |
| pH at time of analysis:           | NA     | Phosphate (PO₄³⁻):  | 0.0         | 0.0    | Manganese (Mn²⁺):  | 0.00  | 0.0    |
| pH used in Calcs:                 | 6      | Silica (SiO₂):      | 0.0         | 0.0    | Lead (Pb²⁺):       | 0.00  | 0.0    |
|                                   |        |                     |             |        | Zinc (Zn²⁺):       | 0.0   | 0.0    |
| Alkalinity by Titration:          | mg/L   |                     |             |        |                    |       |        |
| Bicarbonate (HCO₃⁻):              | 331    |                     |             |        | Aluminum (Al³⁺):   | 0.0   | 0.0    |
| Carbonate (CO₃²⁻):                | 0      |                     |             |        | Chromium (Cr³⁺):   | 0.0   | 0.0    |
| Hydroxide (OH⁻):                  | 0      |                     |             |        | Cobalt (Co²⁺):     | 0.0   | 0.0    |
|                                   |        |                     |             |        | Copper (Cu²⁺):     | 0.0   | 0.0    |
| aqueous CO₂ (ppm):                | 95     | 0.0                 | Formate:    | 0.0    | Molybdenum (Mo²⁺): | 0.0   | 0.0    |
| aqueous H₂S (ppm):                | 10     | 0.0                 | Acetate:    | 0.0    | Nickel (Ni²⁺):     | 0.0   | 0.0    |
| aqueous O₂ (ppb):                 | 0      | 0.0                 | Propionate: | 0.0    | Tin (Sn²⁺):        | 0.0   | 0.0    |
|                                   |        |                     | Butyrate:   | 0.0    | Titanium (Ti²⁺):   | 0.0   | 0.0    |
| Calculated TDS (mg/L):            | 84968  | 0.0                 | Valerate:   | 0.0    | Vanadium (V²⁺):    | 0.0   | 0.0    |
| Density/Specific Gravity (g/cm³): | 1.0450 |                     |             |        | Zirconium (Zr²⁺):  | 0.0   | 0.0    |
| Measured Density/Specific Gravity | 0      |                     |             |        |                    |       |        |
| Conductivity (µmhos):             | 0      |                     |             |        | Total Hardness:    | 7950  | N/A    |
| MCF/D:                            | 0      |                     |             |        |                    |       |        |
| BOPD:                             | 0      |                     |             |        |                    |       |        |
| BWPD:                             | 0      | Anion/Cation Ratio: |             | 1.00   |                    |       |        |

| Conditions |        | Barite (BaSO₄) |           | Calcite (CaCO₃) |           | Gypsum (CaSO₄·2H₂O) |        | Anhydrite (CaSO₄) |           |
|------------|--------|----------------|-----------|-----------------|-----------|---------------------|--------|-------------------|-----------|
| Temp       | Press. | Index          | Amt (PTB) | Index           | Amt (PTB) | Index               | Amount | Index             | Amt (PTB) |
| 100°F      | 25 psi |                | 0.000     | 0.38            | 31.405    | -0.52               | 0.000  | -0.65             | 0.000     |
| 94°F       | 24 psi |                | 0.000     | 0.34            | 28.472    | -0.53               | 0.000  | -0.68             | 0.000     |
| 88°F       | 23 psi |                | 0.000     | 0.30            | 25.382    | -0.53               | 0.000  | -0.71             | 0.000     |
| 81°F       | 22 psi |                | 0.000     | 0.26            | 22.120    | -0.53               | 0.000  | -0.73             | 0.000     |
| 75°F       | 20 psi |                | 0.000     | 0.21            | 18.672    | -0.54               | 0.000  | -0.76             | 0.000     |
| 69°F       | 19 psi |                | 0.000     | 0.17            | 15.014    | -0.54               | 0.000  | -0.79             | 0.000     |
| 63°F       | 18 psi |                | 0.000     | 0.12            | 11.114    | -0.55               | 0.000  | -0.82             | 0.000     |
| 56°F       | 17 psi |                | 0.000     | 0.07            | 6.922     | -0.55               | 0.000  | -0.85             | 0.000     |
| 50°F       | 16 psi |                | 0.000     | 0.02            | 2.347     | -0.56               | 0.000  | -0.88             | 0.000     |
| 44°F       | 15 psi |                | 0.000     | -0.03           | 0.000     | -0.57               | 0.000  | -0.91             | 0.000     |

| Conditions |        | Celestite (SrSO₄) |           | Halite (NaCl) |           | Iron Sulfide (FeS) |           | Iron Carbonate (FeCO₃) |           |
|------------|--------|-------------------|-----------|---------------|-----------|--------------------|-----------|------------------------|-----------|
| Temp       | Press. | Index             | Amt (PTB) | Index         | Amt (PTB) | Index              | Amt (PTB) | Index                  | Amt (PTB) |
| 100°F      | 25 psi |                   | 0.000     | -1.68         | 0.000     | -9.34              | 0.000     | 0.10                   | 3.276     |
| 94°F       | 24 psi |                   | 0.000     | -1.67         | 0.000     | -9.36              | 0.000     | 0.04                   | 1.286     |
| 88°F       | 23 psi |                   | 0.000     | -1.67         | 0.000     | -9.38              | 0.000     | -0.02                  | 0.000     |
| 81°F       | 22 psi |                   | 0.000     | -1.66         | 0.000     | -9.39              | 0.000     | -0.09                  | 0.000     |
| 75°F       | 20 psi |                   | 0.000     | -1.66         | 0.000     | -9.41              | 0.000     | -0.15                  | 0.000     |
| 69°F       | 19 psi |                   | 0.000     | -1.65         | 0.000     | -9.42              | 0.000     | -0.22                  | 0.000     |
| 63°F       | 18 psi |                   | 0.000     | -1.64         | 0.000     | -9.43              | 0.000     | -0.29                  | 0.000     |
| 56°F       | 17 psi |                   | 0.000     | -1.64         | 0.000     | -9.44              | 0.000     | -0.35                  | 0.000     |
| 50°F       | 16 psi |                   | 0.000     | -1.63         | 0.000     | -9.44              | 0.000     | -0.42                  | 0.000     |
| 44°F       | 15 psi |                   | 0.000     | -1.62         | 0.000     | -9.44              | 0.000     | -0.50                  | 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; %CO₂ is not included in the calculations.



ScaleSoftPitzer™  
SSP2010

