KOLAR Document ID: 1400051

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 # 33629
Name: Great Plains Energy, Inc.
Address 1: 6121 S 58TH ST, STE B
Address 2:
City: LIN COLN State: NE Zip: 68516 + ____
Contact Person: Matthew Mondero
Phone: (402) 443-6125
Lease Name: SAUVAGE
Well Number: 9

API No.: 15-039-21080-00-01
Permit No: E31992.6
Reporting Year: 2017
(January 1 to December 31)

NW (Q/Q/Q/Q) - SE - SW - NE Sec. 35 Twp. 4 S. R. 30 ☐ E ☑ W
2260 feet from ☑ N / ☐ S Line of Section
1680 feet from ☑ E / ☐ W Line of Section
County: Decatur

I. Injection Fluid:

Type *(Pick one)*: ☐ Fresh Water ☑ Treated Brine ☐ Untreated Brine ☐ Water/Brine
Source: ☑ Produced Water ☐ Other *(Attach list)*
Quality: Total Dissolved Solids: 89272 mg/l Specific Gravity: 1.06 Additives: Baker-Hughes SCW 2600 Scale Inhibitor
(Attach water analysis, if available)

II. Well Data:

Maximum Authorized Injection Pressure: 1500 psi Injection Zone: LANSING-KANSAS CITY,TORONTO
Maximum Authorized Injection Rate: 1000 barrels per day
Total Number of Enhanced Recovery Injection Wells Covered by this Permit: 1 *(Include TA's)*

III.

Month:	Total Fluid Injected BBL	Maximum Fluid Pressure	Total Gas Injected MCF	Maximum Gas Pressure	# Days of Injection
January	3582	150	0		31
February	2720	150	0		28
March	6893	150	0		31
April	4323	150	0		30
May	3166	150	0		31
June	3218	150	0		24
July	3232	200	0		24
August	7068	200	0		31
September	6962	200	0		30
October	7352	200	0		26
November	8829	200	0		20
December	5000	250	0		18
TOTAL	62345		0		

Submitted Electronically

BAKER HUGHES

Location/Laboratory
Address
City, State, Zip

Report Date: 2/2/2018

Complete Water Analysis Report SSP v.8

Customer:	Great Plains Energy	Sample Date:	2/19/2018
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	
Initial Temperature (°F):	40
Final Temperature (°F):	100
Initial Pressure (psi):	1
Final Pressure (psi):	25
pH:	
pH at time of sampling:	5.8
pH at time of analysis:	NA
pH used in Calcs:	6

Alkalinity by Titration:	mg/L	meq/L
Bicarbonate (HCO_3^-):	280	4.6
Carbonate (CO_3^{2-}):	0	0.0
Hydroxide (OH^-):	0	0.0
aqueous CO_2 (ppm):	110	0.0
aqueous H_2S (ppm):	5	0.0
aqueous O_2 (ppb):	0	0.0
Calculated TDS (mg/L):		89272
Density/Specific Gravity (g/cm³):		1.0600
Measured Density/Specific Gravity		0
Conductivity (µmhos):		0
MCF/D:		0
BOPD:		0
BWPD:		0

Analysis of Sample — Anions:	mg/L	meq/L
Chloride (Cl^-):	54000	1521.1
Sulfate (SO_4^{2-}):	600	12.5
Borate (H_3BO_3):	0.0	0.0
Fluoride (F^-):	0.0	0.0
Bromide (Br^-):	0.0	0.0
Nitrite (NO_2^-):	0.0	0.0
Nitrate (NO_3^-):	0.0	0.0
Phosphate (PO_4^{3-}):	0.0	0.0
Silica (SiO_2):	0.0	0.0

Organic Acids:	mg/L	meq/L
Formate:	0.0	0.0
Acetate:	0.0	0.0
Propionate:	0.0	0.0
Butyrate:	0.0	0.0
Valerate:	0.0	0.0
Anion/Cation Ratio:		1.00

Cations:	mg/L	meq/L
Sodium (Na^+):	30681	1339.8
Potassium (K^+):	0	0.0
Magnesium (Mg^{2+}):	486	40.0
Calcium (Ca^{2+}):	3200	159.7
Strontium (Sr^{2+}):	0	0.0
Barium (Ba^{2+}):	0.0	0.0
Iron (Fe^{2+}):	25.0	0.9
Manganese (Mn^{2+}):	0.00	0.0
Lead (Pb^{2+}):	0.00	0.0
Zinc (Zn^{2+}):	0.0	0.0
Aluminum (Al^{3+}):	0.0	0.0
Chromium (Cr^{3+}):	0.0	0.0
Cobalt (Co^{2+}):	0.0	0.0
Copper (Cu^{2+}):	0.0	0.0
Molybdenum (Mo^{2+}):	0.0	0.0
Nickel (Ni^{2+}):	0.0	0.0
Tin (Sn^{2+}):	0.0	0.0
Titanium (Ti^{2+}):	0.0	0.0
Vanadium (V^{2+}):	0.0	0.0
Zirconium (Zr^{2+}):	0.0	0.0
Total Hardness:	8600	N/A

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	Amount	Index	Amt (PTB)
100°F	25 psi		0.000	0.31	21.919	-0.63	0.000	-0.75	0.000
93°F	24 psi		0.000	0.26	19.009	-0.63	0.000	-0.78	0.000
87°F	23 psi		0.000	0.21	15.925	-0.64	0.000	-0.81	0.000
80°F	22 psi		0.000	0.17	12.647	-0.64	0.000	-0.84	0.000
73°F	20 psi		0.000	0.12	9.155	-0.65	0.000	-0.87	0.000
67°F	19 psi		0.000	0.07	5.416	-0.65	0.000	-0.90	0.000
60°F	18 psi		0.000	0.02	1.383	-0.66	0.000	-0.93	0.000
53°F	17 psi		0.000	-0.04	0.000	-0.66	0.000	-0.97	0.000
47°F	16 psi		0.000	-0.09	0.000	-0.67	0.000	-1.00	0.000
40°F	15 psi		0.000	-0.16	0.000	-0.69	0.000	-1.04	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)
100°F	25 psi		0.000	-1.62	0.000	-9.44	0.000	-0.08	0.000
93°F	24 psi		0.000	-1.62	0.000	-9.46	0.000	-0.15	0.000
87°F	23 psi		0.000	-1.61	0.000	-9.48	0.000	-0.21	0.000
80°F	22 psi		0.000	-1.61	0.000	-9.50	0.000	-0.28	0.000
73°F	20 psi		0.000	-1.60	0.000	-9.51	0.000	-0.35	0.000
67°F	19 psi		0.000	-1.59	0.000	-9.53	0.000	-0.42	0.000
60°F	18 psi		0.000	-1.59	0.000	-9.54	0.000	-0.50	0.000
53°F	17 psi		0.000	-1.58	0.000	-9.55	0.000	-0.57	0.000
47°F	16 psi		0.000	-1.57	0.000	-9.55	0.000	-0.65	0.000
40°F	15 psi		0.000	-1.56	0.000	-9.55	0.000	-0.73	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.

Calculate

EESI ScaleSoftPitzer™ SSP2010

Sample ID: Great Plains Energy, Sauvage#2 SWD, Tank to Disposal