

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	_____	_____	_____	_____	_____



Comprehensive Oilfield Water Analysis

Chemical Customer:	GeoChem KS	Analysis Number:	230718004
Production Customer:	Prairie Wolf	Date Sampled:	July 14, 2023
Lease(Field):	M&M Farns SWD	Date Received:	July 18, 2023
Sample Point:	Tank	Date Completed:	July 26, 2023

PHYSICAL PROPERTIES

pH:	5.70 <i>(Lab)</i>	Total Hardness:	490 <i>mg/l</i>
Density:	1.1230 <i>g/cc</i>	Total Dissolved Solids:	164,005 <i>mg/l</i>
Specific Gravity:	9.366 <i>lbs/gal</i>	Dissolved H ₂ S:	0 <i>ppm</i>
System Temperature:	94 <i>°F</i>	Dissolved CO ₂ :	55.00 <i>mg/L</i>
System Pressure:	0 <i>psi</i>	Total Ionic Strength:	2852.226
Dissolved O ₂ :	nr <i>ppm</i>	Resistivity:	0.0000 <i>ohm meter @ 75F</i>
BOPD:	BWPD:	Gas Flow:	<i>MMSCFD</i>

BRINE COMPOSITION

CATIONS			ANIONS		
	Concentration			Concentration	
	mg/L	meq/L		mg/L	meq/L
Barium	0.92	0	Chloride	101,173	2850
Calcium	14,240.00	710	Carbonate	0	0
Iron	53.99	2	Bicarbonate <i>(Lab)</i>	62.0	1
Magnesium	878.40	72	Sulfate	1.00	0
Manganese	0.076	0			
Potassium	0.00	0			
Sodium	47,584	2069			
Strontium	11.15	0			
Total Cations	62,769	2853	Total Anions	101,236	2851
		<i>Ionic Balance</i>		<i>100.09%</i>	

SCALE INDEX

Temperature (°F)	CaCO ₃	BaSO ₄	FeCO ₃	CaSO ₄
100	0.22	0.01	0.48	0.01

A scaling index greater than 1.000 indicates scaling. Calculations are based on a constant pressure of note or 1 atm if no pressure reported

Greg Swindle

Chemist

July 26, 2023

Date

Geo-Chemicals
517 E 30TH AVE STE D
HUTCHINSON, KS 67502



DownHole SAT(tm)

SURFACE WATER CHEMISTRY INPUT

Prairie Wolf
M&M Farns SWD Tank

Report Date: 07-26-2023 Sampled: 07-14-2023 at 1038
Sample #: 0 Sample ID: 230718004

CATIONS

Calcium (as Ca)	14240
Magnesium (as Mg)	878.40
Barium (as Ba)	1.05
Strontium (as Sr)	11.38
Sodium (as Na)	47584
Potassium (as K)	0.00
Lithium (as Li)	7.94
Ammonia (as NH ₃)	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	52.14
Manganese (as Mn)	0.0760
Zinc (as Zn)	0.00
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	101173
Sulfate (as SO ₄)	1.03
Bromine (as Br)	0.00
Dissolved CO ₂ (as CO ₂)	44.45
Bicarbonate (as HCO ₃)	62.00
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)	0.00
Fluoride (as F)	0.00
Nitrate (as NO ₃)	0.00
Boron (as B)	0.00

PARAMETERS

Calculated T.D.S.	178211
Molar Conductivity	212492
Resistivity	4.71
Sp.Gr.(g/mL)	1.123
Pressure(psia)	1.00
pCO ₂ (atm)	0.0250
pH ₂ S(atm)	0.00
Temperature (°F)	94.00
pH	5.70

CORROSION RATE PREDICTION

CO ₂ - H ₂ S Rate(mpy)	0.399
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FRENCH CREEK SOFTWARE, INC.
1220 VALLEY FORGE ROAD, SUITE 21, VALLEY FORGE, PA 19460



DownHole SAT(tm)

SURFACE WATER DEPOSITION POTENTIAL INDICATORS

Prairie Wolf
M&M Farns SWD Tank

Report Date: 07-26-2023 Sampled: 07-14-2023 at 1038
Sample #: 0 Sample ID: 230718004

SATURATION RATIO as IAP/Ksp

Calcite (CaCO ₃)	0.22
Aragonite (CaCO ₃)	0.20
Witherite (BaCO ₃)	0.00
Strontianite (SrCO ₃)	0.00
Calcium oxalate (CaC ₂ O ₄)	0.00
Magnesite (MgCO ₃)	0.02
Anhydrite (CaSO ₄)	0.00
Gypsum (CaSO ₄ *2H ₂ O)	0.00
Barite (BaSO ₄)	0.00
Celestite (SrSO ₄)	0.00
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)	0.22
Strengite (FePO ₄ *2H ₂ O)	0.00
Siderite (FeCO ₃)	0.48
Halite (NaCl)	0.11
Thenardite (Na ₂ SO ₄)	0.00
Iron sulfide (FeS)	0.00

FREE ION MOMENTARY EXCESS (ppm)

Calcite (CaCO ₃)	-0.0109
Aragonite (CaCO ₃)	-0.0122
Witherite (BaCO ₃)	-82.13
Strontianite (SrCO ₃)	-17.27
Calcium oxalate (CaC ₂ O ₄)	-0.00838
Magnesite (MgCO ₃)	-0.134
Anhydrite (CaSO ₄)	-322.00
Gypsum (CaSO ₄ *2H ₂ O)	-305.58
Barite (BaSO ₄)	-27.34
Celestite (SrSO ₄)	-826.81
Fluorite (CaF ₂)	-5.27
Calcium phosphate	>-0.001
Hydroxyapatite	-922.75
Silica (SiO ₂)	-113.80
Brucite (Mg(OH) ₂)	-0.810
Magnesium silicate	-292.99
Iron hydroxide (Fe(OH) ₃)	< 0.001
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Siderite (FeCO ₃)	-0.00378
Halite (NaCl)	-309167
Thenardite (Na ₂ SO ₄)	-250947
Iron sulfide (FeS)	-1.54

SIMPLE INDICES

Langelier	0.0395
Ryznar	5.62
Puckorius	4.28
Larson-Skold Index	2797
Stiff Davis Index	-0.0702
Oddo-Tomson	-1.06

BOUND IONS

Calcium	15992	15966
Barium	1.18	1.18
Carbonate	0.515	0.00183
Phosphate	0.00	0.00
Sulfate	1.16	0.209

OPERATING CONDITIONS

Temperature (°F)	94.00
Time(mins)	3.00

DownHole SAT™ Water Analysis Report



SYSTEM IDENTIFICATION

Prairie Wolf

M&M Farns SWD
Tank

Sample ID#: 0
ID 230718004

Sample Date: 07-14-2023 at 1038
Report Date: 07-26-2023

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	14240
Magnesium(as Mg)	878.40
Barium(as Ba)	1.05
Strontium(as Sr)	11.38
Sodium(as Na)	47584
Potassium(as K)	0.00
Lithium(as Li)	7.94
Iron(as Fe)	52.14
Ammonia(as NH ₃)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	0.0760
Zinc(as Zn)	0.00
Lead(as Pb)	0.00

ANIONS

Chloride(as Cl)	101173
Sulfate(as SO ₄)	1.03
Bromine(as Br)	0.00
Dissolved CO ₂ (as CO ₂)	44.45
Bicarbonate(as HCO ₃)	62.00
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)	0.00
Fluoride(as F)	0.00
Nitrate(as NO ₃)	0.00
Boron(as B)	0.00

PARAMETERS

Temperature(°F)	94.00	Sample pH	5.70
Conductivity	212492	Sp.Gr.(g/mL)	1.123
Resistivity	4.71	T.D.S.	178211

SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (psia)	Calcite CaCO ₃	Anhydrite CaSO ₄	Gypsum CaSO ₄ *2H ₂ O	Barite BaSO ₄	Celestite SrSO ₄	Siderite FeCO ₃	Mackinawite FeS							
70.00	50.00	0.143	-0.0141	< 0.001	-349.66	0.00122	-289.99	0.00224	-20.74	< 0.001	-836.22	0.268	-0.00744	0.00	-1.43
86.36	500.00	0.204	-0.0126	< 0.001	-357.67	0.00101	-324.63	0.00133	-26.15	< 0.001	-861.69	0.444	-0.00468	0.00	-1.50
102.73	950.00	0.270	-0.0112	< 0.001	-346.22	< 0.001	-355.61	< 0.001	-31.82	< 0.001	-874.13	0.675	-0.00230	0.00	-1.58
119.09	1400.00	0.341	-0.00986	< 0.001	-319.73	< 0.001	-337.93	< 0.001	-37.95	< 0.001	-884.06	0.974	> -0.001	0.00	-1.67
135.45	1850.00	0.421	-0.00858	< 0.001	-283.72	< 0.001	-324.03	< 0.001	-44.98	< 0.001	-897.80	1.37	0.00193	0.00	-1.77
151.82	2300.00	0.507	-0.00731	< 0.001	-243.47	< 0.001	-315.69	< 0.001	-53.05	< 0.001	-915.95	1.87	0.00405	0.00	-1.88
168.18	2750.00	0.598	-0.00606	0.00105	-203.22	< 0.001	-312.76	< 0.001	-62.37	< 0.001	-939.33	2.50	0.00626	0.00	-2.01
184.55	3200.00	0.689	-0.00483	0.00124	-165.88	< 0.001	-317.80	< 0.001	-73.19	< 0.001	-968.92	3.27	0.00860	0.00	-2.15
200.91	3650.00	0.776	-0.00364	0.00149	-133.08	< 0.001	-332.68	< 0.001	-85.85	< 0.001	-1006	4.19	0.0111	0.00	-2.31
217.27	4100.00	0.839	-0.00288	0.00181	-109.03	< 0.001	-370.68	< 0.001	-102.56	< 0.001	-1070	5.17	0.0140	0.00	-2.56
233.64	4550.00	0.901	-0.00194	0.00223	-85.91	< 0.001	-413.97	< 0.001	-120.90	< 0.001	-1130	6.33	0.0171	0.00	-2.78
250.00	5000.00	0.944	-0.00121	0.00278	-67.36	< 0.001	-479.80	< 0.001	-142.99	< 0.001	-1203	7.60	0.0205	0.00	-3.03
		xSAT	mg/L	xSAT	mg/L	xSAT	mg/L	xSAT	mg/L	xSAT	mg/L	xSAT	mg/L	xSAT	mg/L

Saturation Ratios (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. mg/L scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.

