

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
KEARNY KS

SAUER A SWDW
DUMP VALVE

Report Date: 01-02-2019 Sampled: 12-14-2018
Sample #: 3076 at 0000

Sample ID: 208785

CATIONS

Calcium (as Ca)	8827
Magnesium (as Mg)	5562
Barium (as Ba)	0.230
Strontium (as Sr)	200.70
Sodium (as Na)	66860
Potassium (as K)	855.20
Lithium (as Li)	7.97
Ammonia (as NH ₃)	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	3.79
Manganese (as Mn)	4.08
Zinc (as Zn)	0.125
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	151600
Sulfate (as SO ₄)	900.00
Bromine (as Br)	0.00
Dissolved CO ₂ (as CO ₂)	75.00
Bicarbonate (as HCO ₃)	30.50
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)	12.22

PARAMETERS

Calculated T.D.S.	223316
Molar Conductivity	410193
Resistivity	2.44
Sp.Gr.(g/mL)	1.16
Pressure(atm)	1.00
pCO ₂ (atm)	0.00244
pH ₂ S(atm)	0.00356
Temperature (°F)	57.50
pH	6.86

COMMENTS

KEARNY KS

JACAM LABORATORIES

205 S. Broadway · P.O. Box 96 · Sterling, KS 67579-0096



LINN OPERATING
JEFF SULLIVAN
KEARNY KS

SAUER A SWDW
DUMP VALVE

Report Date: 01-02-2019 Sampled: 12-14-2018
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SATURATION LEVEL

Calcite (CaCO ₃)	0.232
Aragonite (CaCO ₃)	0.205
Witherite (BaCO ₃)	< 0.001
Strontianite (SrCO ₃)	0.00442
Calcium oxalate (CaC ₂ O ₄)	0.00
Magnesite (MgCO ₃)	0.155
Anhydrite (CaSO ₄)	0.392
Gypsum (CaSO ₄ *2H ₂ O)	0.520
Barite (BaSO ₄)	0.345
Celestite (SrSO ₄)	0.146
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)	0.0340
Halite (NaCl)	0.241
Thenardite (Na ₂ SO ₄)	< 0.001
Iron sulfide (FeS)	1.19

MOMENTARY EXCESS (Lbs/1000 Barrels)

Calcite (CaCO ₃)	-0.00674
Aragonite (CaCO ₃)	-0.00789
Witherite (BaCO ₃)	-26.83
Strontianite (SrCO ₃)	-0.674
Calcium oxalate (CaC ₂ O ₄)	-0.00365
Magnesite (MgCO ₃)	-0.00935
Anhydrite (CaSO ₄)	-110.29
Gypsum (CaSO ₄ *2H ₂ O)	-74.77
Barite (BaSO ₄)	-0.257
Celestite (SrSO ₄)	-191.79
Fluorite (CaF ₂)	-1.87
Calcium phosphate	>-0.001
Hydroxyapatite	-230.13
Silica (SiO ₂)	-21.73
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	-76.70
Iron hydroxide (Fe(OH) ₃)	< 0.001
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Siderite (FeCO ₃)	-0.0654
Halite (NaCl)	-69518
Thenardite (Na ₂ SO ₄)	-88243
Iron sulfide (FeS)	0.0364

SIMPLE INDICES

Langelier	0.278
Ryznar	6.30
Puckorius	6.88
Larson-Skold Index	11946
Stiff Davis Index	0.175
Oddo-Tomson	-0.821

BOUND IONS

Calcium	8827	8701
Barium	0.230	0.230
Carbonate	0.879	0.00351
Phosphate	0.00	0.00
Sulfate	900.00	146.66

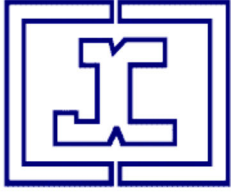
TOTAL

FREE

OPERATING CONDITIONS

Temperature (°F) 57.50
Time(secs) 0.00

DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

SYSTEM IDENTIFICATION

LINN OPERATING
SAUER A SWDW
JEFF SULLIVAN
DUMP VALVE
KEARNY KS

Sample ID#: 3076
ID: 208785
Report Date: 01-02-2019
Sample Date: 12-14-2018
at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	8827
Magnesium(as Mg)	5562
Barium(as Ba)	0.230
Strontium(as Sr)	200.70
Sodium(as Na)	66860
Potassium(as K)	855.20
Lithium(as Li)	7.97
Iron(as Fe)	3.79
Field Iron(as Fe)	10.00
Ammonia(as NH ₃)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	4.08
Zinc(as Zn)	0.125
Lead(as Pb)	0.00

ANIONS

Chloride(as Cl)	151600
Sulfate(as SO ₄)	900.00
Bromine(as Br)	0.00
Dissolved CO ₂ (as CO ₂)	75.00
Bicarbonate(as HCO ₃)	30.50
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)	12.22

PARAMETERS

Temperature(°F)	57.50
T.D.S.	223316
Conductivity:	410193
Sample pH	6.86
Resistivity:	2.44

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	0.199	-0.00748	0.423	-102.38	0.567	-65.15	0.452	-0.164	0.161	-182.42	0.0276	-0.0739	6.02	0.255	0.0216	0.00244
65.45	0.00	0.269	-0.00603	0.368	-115.79	0.477	-84.04	0.264	-0.378	0.135	-198.58	0.0417	-0.0577	5.06	0.240	0.0405	0.00244
80.91	0.00	0.341	-0.00486	0.339	-118.55	0.410	-99.37	0.164	-0.690	0.121	-205.09	0.0588	-0.0457	4.22	0.222	0.0137	0.00244
96.36	0.00	0.406	-0.00397	0.329	-112.40	0.360	-111.27	0.108	-1.11	0.111	-206.20	0.0775	-0.0368	3.52	0.201	0.0179	0.00244
111.82	0.00	0.455	-0.00334	0.335	-99.88	0.346	-107.81	0.0742	-1.67	0.105	-204.99	0.0956	-0.0302	2.94	0.179	0.0187	0.00244
127.27	0.00	0.485	-0.00293	0.356	-83.60	0.352	-96.02	0.0520	-2.41	0.0984	-204.42	0.112	-0.0251	2.47	0.155	0.00303	0.00244
142.73	0.00	0.492	-0.00270	0.393	-65.92	0.357	-86.86	0.0369	-3.40	0.0922	-204.71	0.123	-0.0214	2.09	0.130	0.00729	0.00244
158.18	0.00	0.474	-0.00265	0.449	-48.63	0.360	-79.75	0.0265	-4.68	0.0863	-205.85	0.128	-0.0186	1.78	0.103	0.0118	0.00244
173.64	0.00	0.436	-0.00272	0.530	-32.87	0.361	-74.24	0.0193	-6.30	0.0808	-207.83	0.127	-0.0166	1.51	0.0758	0.0158	0.00244
189.09	0.00	0.385	-0.00287	0.645	-19.28	0.361	-70.04	0.0142	-8.32	0.0755	-210.67	0.120	-0.0152	1.29	0.0467	0.00955	0.00244
204.55	0.00	0.328	-0.00306	0.806	-8.05	0.359	-66.93	0.0105	-10.75	0.0706	-214.41	0.108	-0.0142	1.09	0.0162	0.00915	0.00244
220.00	0.171	0.264	-0.00341	1.03	0.805	0.355	-67.22	0.00787	-13.78	0.0657	-223.75	0.0920	-0.0139	1.03	0.00590	0.0129	0.00285
		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.

