

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
KENT MILBURN
STEVENS KS

PERRILL SWDW
TANK BATTERY

Report Date: 12-31-2018 Sampled: 12-12-2018
Sample #: 3076 at 0000

Sample ID: 208731

CATIONS

Calcium (as Ca)	671.50
Magnesium (as Mg)	236.70
Barium (as Ba)	0.0360
Strontium (as Sr)	13.88
Sodium (as Na)	7063
Potassium (as K)	77.34
Lithium (as Li)	0.650
Ammonia (as NH ₃)	0.00
Aluminum (as Al)	0.0260
Iron (as Fe)	0.509
Manganese (as Mn)	0.873
Zinc (as Zn)	0.0820
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	12800
Sulfate (as SO ₄)	100.00
Bromine (as Br)	0.00
Dissolved CO ₂ (as CO ₂)	60.00
Bicarbonate (as HCO ₃)	176.90
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)	10.50
Fluoride (as F)	0.00
Nitrate (as NO ₃)	0.00
Boron (as B)	0.291

PARAMETERS

Calculated T.D.S.	21270
Molar Conductivity	30656
Resistivity	32.62
Sp.Gr.(g/mL)	1.01
Pressure(atm)	1.00
pCO ₂ (atm)	0.0537
pH ₂ S(atm)	0.00647
Temperature (°F)	44.00
pH	6.00

COMMENTS

STEVENS KS



DownHole Rx

DEPOSITION POTENTIAL INDICATORS

LINN OPERATING
KENT MILBURN
STEVENS KS

PERRILL SWDW
TANK BATTERY

Report Date: 12-31-2018 Sampled: 12-12-2018
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SATURATION LEVEL

Calcite (CaCO ₃)	0.0404
Aragonite (CaCO ₃)	0.0361
Witherite (BaCO ₃)	< 0.001
Strontianite (SrCO ₃)	0.00418
Calcium oxalate (CaC ₂ O ₄)	0.00
Magnesite (MgCO ₃)	0.00853
Anhydrite (CaSO ₄)	0.0186
Gypsum (CaSO ₄ *2H ₂ O)	0.0329
Barite (BaSO ₄)	0.242
Celestite (SrSO ₄)	0.0320
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)	0.0402
Halite (NaCl)	0.00157
Thenardite (Na ₂ SO ₄)	< 0.001
Iron sulfide (FeS)	0.0387

MOMENTARY EXCESS (Lbs/1000 Barrels)

Calcite (CaCO ₃)	-0.167
Aragonite (CaCO ₃)	-0.188
Witherite (BaCO ₃)	-12.76
Strontianite (SrCO ₃)	-1.99
Calcium oxalate (CaC ₂ O ₄)	-0.0625
Magnesite (MgCO ₃)	-0.689
Anhydrite (CaSO ₄)	-882.11
Gypsum (CaSO ₄ *2H ₂ O)	-672.26
Barite (BaSO ₄)	-0.0667
Celestite (SrSO ₄)	-96.69
Fluorite (CaF ₂)	-8.12
Calcium phosphate	>-0.001
Hydroxyapatite	-251.31
Silica (SiO ₂)	-24.84
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	-81.21
Iron hydroxide (Fe(OH) ₃)	< 0.001
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Siderite (FeCO ₃)	-0.139
Halite (NaCl)	-163473
Thenardite (Na ₂ SO ₄)	-58341
Iron sulfide (FeS)	-0.602

SIMPLE INDICES

Langelier	-1.32
Ryznar	8.64
Puckorius	6.96
Larson-Skold Index	128.26
Stiff Davis Index	-1.63
Oddo-Tomson	-1.80

BOUND IONS

Calcium	671.50	661.98
Barium	0.0360	0.0360
Carbonate	0.0474	0.0121
Phosphate	0.00	0.00
Sulfate	100.00	73.71

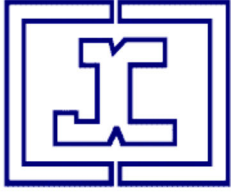
TOTAL

FREE

OPERATING CONDITIONS

Temperature (°F)	44.00
Time(secs)	0.00

DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

SYSTEM IDENTIFICATION

LINN OPERATING
PERRILL SWDW
KENT MILBURN
TANK BATTERY
STEVENS KS

Sample ID#: 3076
ID: 208731
Report Date: 12-31-2018
Sample Date: 12-12-2018
at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	671.50
Magnesium(as Mg)	236.70
Barium(as Ba)	0.0360
Strontium(as Sr)	13.88
Sodium(as Na)	7063
Potassium(as K)	77.34
Lithium(as Li)	0.650
Iron(as Fe)	0.509
Field Iron(as Fe)	0.00
Ammonia(as NH ₃)	0.00
Aluminum(as Al)	0.0260
Manganese(as Mn)	0.873
Zinc(as Zn)	0.0820
Lead(as Pb)	0.00

ANIONS

Chloride(as Cl)	12800
Sulfate(as SO ₄)	100.00
Bromine(as Br)	0.00
Dissolved CO ₂ (as CO ₂)	60.00
Bicarbonate(as HCO ₃)	176.90
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)	10.50
Fluoride(as F)	0.00
Nitrate(as NO ₃)	0.00
Boron(as B)	0.291

PARAMETERS

Temperature(°F)	44.00
Sample pH	6.00
T.D.S.	21270
Conductivity:	30656
Resistivity:	32.62

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	0.0471	-0.157	0.0180	-897.17	0.0316	-686.06	0.200	-0.0853	0.0302	-99.80	0.0490	-0.127	0.244	-0.206	0.159	0.0537
65.45	0.00	0.0673	-0.135	0.0171	-910.85	0.0290	-714.74	0.128	-0.145	0.0278	-103.91	0.0787	-0.101	0.239	-0.210	0.466	0.0537
80.91	0.00	0.0918	-0.116	0.0171	-891.11	0.0272	-733.88	0.0866	-0.224	0.0271	-104.22	0.120	-0.0796	0.230	-0.216	0.357	0.0537
96.36	0.00	0.120	-0.101	0.0181	-843.48	0.0259	-744.19	0.0620	-0.321	0.0272	-102.50	0.173	-0.0624	0.219	-0.225	0.468	0.0537
111.82	0.00	0.151	-0.0878	0.0199	-774.70	0.0269	-709.14	0.0463	-0.436	0.0277	-99.99	0.240	-0.0484	0.207	-0.236	0.498	0.0537
127.27	0.00	0.187	-0.0768	0.0227	-691.88	0.0296	-649.37	0.0350	-0.582	0.0281	-97.89	0.326	-0.0366	0.196	-0.246	0.436	0.0537
142.73	0.00	0.228	-0.0673	0.0269	-601.63	0.0321	-598.76	0.0267	-0.767	0.0283	-96.25	0.434	-0.0265	0.187	-0.256	0.367	0.0537
158.18	0.00	0.275	-0.0588	0.0328	-509.69	0.0345	-555.87	0.0205	-0.999	0.0283	-95.03	0.568	-0.0176	0.178	-0.265	0.342	0.0537
173.64	0.00	0.327	-0.0513	0.0412	-420.66	0.0368	-519.55	0.0158	-1.29	0.0282	-94.20	0.729	-0.00967	0.169	-0.274	0.317	0.0537
189.09	0.00	0.384	-0.0445	0.0529	-338.02	0.0389	-488.88	0.0123	-1.65	0.0279	-93.73	0.922	-0.00246	0.160	-0.283	0.139	0.0537
204.55	0.00	0.446	-0.0382	0.0695	-264.07	0.0408	-463.16	0.00968	-2.09	0.0274	-93.62	1.15	0.00421	0.151	-0.294	0.0955	0.0537
220.00	0.171	0.504	-0.0337	0.0916	-204.71	0.0417	-450.62	0.00751	-2.66	0.0265	-95.18	1.39	0.0102	0.162	-0.268	0.107	0.0629
		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.

