

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
STANTON KS

KELLAM 1
TANK BATTERY

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

Sample ID: 208733

CATIONS

Calcium (as Ca)	6669
Magnesium (as Mg)	5394
Barium (as Ba)	0.210
Strontium (as Sr)	194.20
Sodium (as Na)	82166
Potassium (as K)	837.80
Lithium (as Li)	10.79
Ammonia (as NH ₃)	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	0.536
Manganese (as Mn)	3.76
Zinc (as Zn)	0.0820
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	178000
Sulfate (as SO ₄)	1125
Bromine (as Br)	0.00
Dissolved CO ₂ (as CO ₂)	105.00
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)	0.500
Fluoride (as F)	0.00
Nitrate (as NO ₃)	0.00
Boron (as B)	2.57

PARAMETERS

Calculated T.D.S.	256235
Molar Conductivity	510601
Resistivity	1.96
Sp.Gr.(g/mL)	1.18
Pressure(atm)	1.00
pCO ₂ (atm)	0.0137
pH ₂ S(atm)	< 0.001
Temperature (°F)	43.00
pH	5.00

COMMENTS

STANTON KS

JACAM LABORATORIES

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



JACAM LABORATORIES

DownHole R_x

DEPOSITION POTENTIAL INDICATORS

LINN OPERATING
KENT MILBURN
STANTON KS

KELLAM 1
TANK BATTERY

Report Date:	12-31-2018	Sampled:	12-12-2018
Sample #:	3076		at 0000
Sample ID:	208733		

SATURATION LEVEL

Calcite (CaCO ₃)	0.00234
Aragonite (CaCO ₃)	0.00209
Witherite (BaCO ₃)	< 0.001
Strontianite (SrCO ₃)	< 0.001
Calcium oxalate (CaC ₂ O ₄)	0.00
Magnesite (MgCO ₃)	0.00181
Anhydrite (CaSO ₄)	0.480
Gypsum (CaSO ₄ *2H ₂ O)	0.608
Barite (BaSO ₄)	0.602
Celestite (SrSO ₄)	0.194
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)	< 0.001
Halite (NaCl)	0.401
Thenardite (Na ₂ SO ₄)	< 0.001
Iron sulfide (FeS)	< 0.001

MOMENTARY EXCESS (Lbs/1000 Barrels)

Calcite (CaCO ₃)	-0.0109
Aragonite (CaCO ₃)	-0.0122
Witherite (BaCO ₃)	-24.79
Strontianite (SrCO ₃)	-0.648
Calcium oxalate (CaC ₂ O ₄)	-0.00387
Magnesite (MgCO ₃)	-0.0118
Anhydrite (CaSO ₄)	-102.80
Gypsum (CaSO ₄ *2H ₂ O)	-69.52
Barite (BaSO ₄)	-0.0821
Celestite (SrSO ₄)	-173.07
Fluorite (CaF ₂)	-1.85
Calcium phosphate	>-0.001
Hydroxyapatite	-192.93
Silica (SiO ₂)	-16.17
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	-66.87
Iron hydroxide (Fe(OH) ₃)	< 0.001
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Siderite (FeCO ₃)	-0.337
Halite (NaCl)	-45698
Thenardite (Na ₂ SO ₄)	-88912
Iron sulfide (FeS)	-3.63

SIMPLE INDICES

Langelier	-1.73
Ryznar	8.46
Puckorius	7.11
Larson-Skold Index	12012
Stiff Davis Index	-1.66
Oddo-Tomson	-2.75

BOUND IONS

Calcium	6669
Barium	0.210
Carbonate	0.0132
Phosphate	0.00
Sulfate	1125

TOTAL

FREE

6532
0.210
< 0.001
0.00
197.09

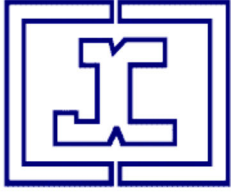
OPERATING CONDITIONS

Temperature (°F)	43.00
Time(secs)	0.00

JACAM LABORATORIES

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

DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

SYSTEM IDENTIFICATION

LINN OPERATING
KELLAM 1
KENT MILBURN
TANK BATTERY
STANTON KS

Sample ID#: 3076
ID: 208733
Report Date: 12-31-2018
Sample Date: 12-12-2018
at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	6669
Magnesium(as Mg)	5394
Barium(as Ba)	0.210
Strontium(as Sr)	194.20
Sodium(as Na)	82166
Potassium(as K)	837.80
Lithium(as Li)	10.79
Iron(as Fe)	0.536
Field Iron(as Fe)	0.00
Ammonia(as NH ₃)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	3.76
Zinc(as Zn)	0.0820
Lead(as Pb)	0.00

ANIONS

Chloride(as Cl)	178000
Sulfate(as SO ₄)	1125
Bromine(as Br)	0.00
Dissolved CO ₂ (as CO ₂)	105.00
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)	0.500
Fluoride(as F)	0.00
Nitrate(as NO ₃)	0.00
Boron(as B)	2.57

PARAMETERS

Temperature(°F)	43.00
Sample pH	5.00
Conductivity:	510601
T.D.S.	256235
Resistivity:	1.96

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	0.00277	-0.0102	0.440	-114.47	0.556	-81.62	0.460	-0.146	0.173	-186.09	< 0.001	-0.312	< 0.001	-3.65	0.168	0.0137
65.45	0.00	0.00386	-0.00902	0.380	-130.76	0.465	-105.06	0.266	-0.342	0.144	-204.13	< 0.001	-0.264	< 0.001	-3.70	0.664	0.0137
80.91	0.00	0.00511	-0.00806	0.348	-134.66	0.397	-124.03	0.164	-0.630	0.128	-211.98	< 0.001	-0.225	< 0.001	-3.75	0.357	0.0137
96.36	0.00	0.00648	-0.00729	0.335	-128.22	0.346	-138.74	0.107	-1.03	0.118	-214.06	< 0.001	-0.194	< 0.001	-3.81	0.467	0.0137
111.82	0.00	0.00792	-0.00667	0.339	-114.33	0.330	-134.71	0.0732	-1.55	0.110	-213.58	< 0.001	-0.169	< 0.001	-3.88	0.530	0.0137
127.27	0.00	0.00951	-0.00617	0.358	-96.04	0.335	-120.51	0.0510	-2.26	0.102	-213.67	< 0.001	-0.149	< 0.001	-3.95	0.541	0.0137
142.73	0.00	0.0113	-0.00578	0.394	-76.01	0.337	-109.46	0.0359	-3.21	0.0954	-214.58	< 0.001	-0.132	< 0.001	-4.03	0.539	0.0137
158.18	0.00	0.0132	-0.00546	0.448	-56.32	0.338	-94.20	0.0257	-4.47	0.0888	-216.31	< 0.001	-0.118	< 0.001	-4.12	0.502	0.0137
173.64	0.00	0.0151	-0.00521	0.527	-38.35	0.338	-94.20	0.0185	-6.08	0.0825	-218.87	< 0.001	-0.107	< 0.001	-4.21	0.466	0.0137
189.09	0.00	0.0171	-0.00502	0.638	-22.81	0.336	-89.12	0.0136	-8.09	0.0768	-222.30	< 0.001	-0.0974	< 0.001	-4.32	0.250	0.0137
204.55	0.00	0.0191	-0.00489	0.793	-9.95	0.333	-85.37	0.0100	-10.56	0.0714	-226.64	< 0.001	-0.0898	< 0.001	-4.43	0.177	0.0137
220.00	0.171	0.0206	-0.00497	1.00	0.157	0.328	-85.89	0.00745	-13.65	0.0661	-236.87	0.00115	-0.0858	< 0.001	-4.59	0.175	0.0160
		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.

