

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	_____	_____	_____	_____	_____
	<b>TOTAL</b>	_____	_____	_____	_____	_____



LINN OPERATING  
DREW LOTT  
HAMILTON KS

HCU 2231 E SWD  
FLOWLINE

Report Date: 03-06-2017    Sampled: 01-24-2017  
Sample #: 3076                                  at 0000

Sample ID: 145344

**CATIONS**

Calcium (as Ca)	5848
Magnesium (as Mg)	1621
Barium (as Ba)	0.204
Strontium (as Sr)	163.30
Sodium (as Na)	24320
Potassium (as K)	543.30
Lithium (as Li)	27.50
Ammonia (as NH <sub>3</sub> )	0.00
Aluminum (as Al)	1.91
Iron (as Fe)	0.0510
Manganese (as Mn)	0.0120
Zinc (as Zn)	1.67
Lead (as Pb)	0.00

**ANIONS**

Chloride (as Cl)	54200
Sulfate (as SO <sub>4</sub> )	1750
Bromine (as Br)	0.00
Dissolved CO <sub>2</sub> (as CO <sub>2</sub> )	80.00
Bicarbonate (as HCO <sub>3</sub> )	84.00
Carbonate (as CO <sub>3</sub> )	0.00
Oxalic acid (as C <sub>2</sub> O <sub>4</sub> )	0.00
Silica (as SiO <sub>2</sub> )	0.00
Phosphate(as PO <sub>4</sub> )	0.00
H <sub>2</sub> S (as H <sub>2</sub> S)	0.00
Fluoride (as F)	0.00
Nitrate (as NO <sub>3</sub> )	0.00
Boron (as B)	25.66

**PARAMETERS**

Calculated T.D.S.	87675
Molar Conductivity	118908
Resistivity	8.41
Sp.Gr.(g/mL)	1.06
Pressure(atm)	1.00
pCO <sub>2</sub> (atm)	0.00943
pH <sub>2</sub> S(atm)	0.00
Temperature (°F)	42.00
pH	6.70

**COMMENTS**

HAMILTON KS

JACAM LABORATORIES

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



LINN OPERATING		HCU 2231 E SWD	
DREW LOTT		FLOWLINE	
HAMILTON KS			
Report Date:	03-06-2017	Sampled:	01-24-2017
Sample #:	3076		at 0000
Sample ID:	145344		

**SATURATION LEVEL**

Calcite (CaCO <sub>3</sub> )	0.393
Aragonite (CaCO <sub>3</sub> )	0.352
Witherite (BaCO <sub>3</sub> )	< 0.001
Strontianite (SrCO <sub>3</sub> )	0.0357
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	0.00
Magnesite (MgCO <sub>3</sub> )	0.0760
Anhydrite (CaSO <sub>4</sub> )	0.893
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	1.46
Barite (BaSO <sub>4</sub> )	4.88
Celestite (SrSO <sub>4</sub> )	1.31
Fluorite (CaF <sub>2</sub> )	0.00
Calcium phosphate	0.00
Hydroxyapatite	0.00
Silica (SiO <sub>2</sub> )	0.00
Brucite (Mg(OH) <sub>2</sub> )	< 0.001
Magnesium silicate	0.00
Iron hydroxide (Fe(OH) <sub>3</sub> )	0.0460
Strengite (FePO <sub>4</sub> *2H <sub>2</sub> O)	0.00
Siderite (FeCO <sub>3</sub> )	0.00295
Halite (NaCl)	0.0221
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	< 0.001
Iron sulfide (FeS)	0.00

**MOMENTARY EXCESS (Lbs/1000 Barrels)**

Calcite (CaCO <sub>3</sub> )	-0.0190
Aragonite (CaCO <sub>3</sub> )	-0.0227
Witherite (BaCO <sub>3</sub> )	-19.83
Strontianite (SrCO <sub>3</sub> )	-0.488
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	-0.0110
Magnesite (MgCO <sub>3</sub> )	-0.126
Anhydrite (CaSO <sub>4</sub> )	-40.70
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	123.40
Barite (BaSO <sub>4</sub> )	0.0960
Celestite (SrSO <sub>4</sub> )	23.72
Fluorite (CaF <sub>2</sub> )	-3.24
Calcium phosphate	>-0.001
Hydroxyapatite	-288.06
Silica (SiO <sub>2</sub> )	-21.82
Brucite (Mg(OH) <sub>2</sub> )	< 0.001
Magnesium silicate	-84.68
Iron hydroxide (Fe(OH) <sub>3</sub> )	< 0.001
Strengite (FePO <sub>4</sub> *2H <sub>2</sub> O)	>-0.001
Siderite (FeCO <sub>3</sub> )	-0.392
Halite (NaCl)	-145529
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	-77107
Iron sulfide (FeS)	-0.460

**SIMPLE INDICES**

Langelier	-0.0934
Ryznar	6.89
Puckorius	6.44
Larson-Skold Index	1290
Stiff Davis Index	-0.628
Oddo-Tomson	-1.12

**BOUND IONS**

Calcium	5848
Barium	0.204
Carbonate	0.372
Phosphate	0.00
Sulfate	1750

**TOTAL**

**FREE**

5576
0.204
0.0212
0.00
730.11

**OPERATING CONDITIONS**

Temperature (°F)	42.00
Time(secs)	0.00

# DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

## SYSTEM IDENTIFICATION

LINN OPERATING  
 HCU 2231 E SWD  
 DREW LOTT  
 FLOWLINE  
 HAMILTON KS

Sample ID#: 3076  
 ID: 145344  
 Report Date: 03-06-2017  
 Sample Date: 01-24-2017  
 at 0000

## WATER CHEMISTRY

### CATIONS

Calcium(as Ca)	5848
Magnesium(as Mg)	1621
Barium(as Ba)	0.204
Strontium(as Sr)	163.30
Sodium(as Na)	24320
Potassium(as K)	543.30
Lithium(as Li)	27.50
Iron(as Fe)	0.0510
Field Iron(as Fe)	0.00
Ammonia(as NH <sub>3</sub> )	0.00
Aluminum(as Al)	1.91
Manganese(as Mn)	0.0120
Zinc(as Zn)	1.67
Lead(as Pb)	0.00

### ANIONS

Chloride(as Cl)	54200
Sulfate(as SO <sub>4</sub> )	1750
Bromine(as Br)	0.00
Dissolved CO <sub>2</sub> (as CO <sub>2</sub> )	80.00
Bicarbonate(as HCO <sub>3</sub> )	84.00
Carbonate(as CO <sub>3</sub> )	0.00
Silica(as SiO <sub>2</sub> )	0.00
Phosphate(as PO <sub>4</sub> )	0.00
H <sub>2</sub> S (as H <sub>2</sub> S)	0.00
Fluoride(as F)	0.00
Nitrate(as NO <sub>3</sub> )	0.00
Boron(as B)	25.66

### PARAMETERS

Temperature(°F)	42.00
T.D.S.	87675
Resistivity:	8.41
Sample pH	6.70
Conductivity:	118908

## SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO <sub>3</sub>		Anhydrite CaSO <sub>4</sub>		Gypsum CaSO <sub>4</sub> *2H <sub>2</sub> O		Barite BaSO <sub>4</sub>		Celestite SrSO <sub>4</sub>		Siderite FeCO <sub>3</sub>		Mackawenite FeS		CO <sub>2</sub> (mpy)	pCO <sub>2</sub> (atm)
50.00	0.00	0.473	-0.0154	0.834	-65.77	1.36	100.38	3.70	0.0882	1.19	15.51	0.00378	-0.364	0.00	-0.462	0.0602	0.00943
65.45	0.00	0.654	-0.00890	0.765	-95.52	1.20	61.01	2.28	0.0679	1.05	4.91	0.00587	-0.318	0.00	-0.468	0.113	0.00943
80.91	0.00	0.864	-0.00311	0.743	-102.05	1.09	28.41	1.50	0.0400	0.994	-0.586	0.00865	-0.279	0.00	-0.474	0.0541	0.00943
96.36	0.00	1.10	0.00205	0.759	-89.29	1.01	2.44	1.04	0.00422	0.968	-3.03	0.0122	-0.248	0.00	-0.481	0.0667	0.00943
111.82	0.00	1.35	0.00656	0.811	-62.72	1.02	5.14	0.750	-0.0402	0.957	-4.10	0.0165	-0.221	0.00	-0.489	0.0588	0.00943
127.27	0.00	1.62	0.0108	0.902	-28.03	1.09	23.35	0.551	-0.0984	0.942	-5.48	0.0217	-0.198	0.00	-0.497	0.0392	0.00943
142.73	0.00	1.91	0.0148	1.04	9.72	1.15	36.84	0.409	-0.175	0.923	-7.29	0.0279	-0.179	0.00	-0.506	0.0230	0.00943
158.18	0.00	2.21	0.0184	1.24	46.64	1.21	46.83	0.306	-0.274	0.901	-9.48	0.0349	-0.163	0.00	-0.515	0.0145	0.00943
173.64	0.00	2.49	0.0217	1.52	80.14	1.26	54.21	0.232	-0.401	0.876	-12.01	0.0425	-0.149	0.00	-0.526	0.00563	0.00943
189.09	0.00	2.75	0.0244	1.92	108.81	1.30	59.57	0.176	-0.563	0.849	-14.89	0.0502	-0.137	0.00	-0.537	0.0165	0.00943
204.55	0.00	2.97	0.0265	2.47	132.42	1.34	63.55	0.136	-0.768	0.820	-18.06	0.0575	-0.127	0.00	-0.550	0.0138	0.00943
220.00	0.171	3.06	0.0281	3.22	153.61	1.36	65.82	0.104	-1.04	0.781	-22.76	0.0627	-0.121	0.00	-0.568	0.0188	0.0110

  

	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels	Lbs per xSAT 1000 Barrels
50.00							
65.45							
80.91							
96.36							
111.82							
127.27							
142.73							
158.18							
173.64							
189.09							
204.55							
220.00							

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO<sub>3</sub>}/K<sub>sp</sub>. pCO<sub>2</sub> (atm) is the partial pressure of CO<sub>2</sub> in the gas phase. Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.

