



# 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>	_____	_____	_____	_____	_____



JACAM LABORATORIES

## DownHole R<sub>x</sub>

WATER CHEMISTRY

LINN OPERATING  
MICHAEL BELLOMY

KELLAM 1  
FLOWLINE

Report Date: 01-22-2016    Sampled: 01-11-2016  
Sample #: 3076                          at 0000  
Sample ID: 117372

### CATIONS

Calcium (as Ca)	7234
Magnesium (as Mg)	2736
Barium (as Ba)	0.204
Strontium (as Sr)	149.40
Sodium (as Na)	76197
Potassium (as K)	456.90
Lithium (as Li)	6.40
Ammonia (as NH <sub>3</sub> )	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	0.935
Manganese (as Mn)	0.424
Zinc (as Zn)	1.02
Lead (as Pb)	0.00

### ANIONS

Chloride (as Cl)	157400
Sulfate (as SO <sub>4</sub> )	1400
Bromine (as Br)	0.00
Dissolved CO <sub>2</sub> (as CO <sub>2</sub> )	70.00
Bicarbonate (as HCO <sub>3</sub> )	12.20
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)	0.500
Fluoride (as F)	0.00
Nitrate (as NO <sub>3</sub> )	0.00
Boron (as B)	0.291

### PARAMETERS

Calculated T.D.S.	231948
Molar Conductivity	421386
Resistivity	2.37
Sp.Gr.(g/mL)	1.17
Pressure(atm)	1.00
pCO <sub>2</sub> (atm)	0.00391
pH <sub>2</sub> S(atm)	< 0.001
Temperature (°F)	47.90
pH	5.85

JACAM LABORATORIES

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

LINN OPERATING  
MICHAEL BELLOMYKELLAM 1  
FLOWLINEReport Date: 01-22-2016    Sampled: 01-11-2016  
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Sample ID: 117372

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**SATURATION LEVEL**

Calcite (CaCO <sub>3</sub> )	0.0103
Aragonite (CaCO <sub>3</sub> )	0.00920
Witherite (BaCO <sub>3</sub> )	< 0.001
Strontianite (SrCO <sub>3</sub> )	< 0.001
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	0.00
Magnesite (MgCO <sub>3</sub> )	0.00373
Anhydrite (CaSO <sub>4</sub> )	0.718
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	0.948
Barite (BaSO <sub>4</sub> )	0.913
Celestite (SrSO <sub>4</sub> )	0.259
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> )	< 0.001
Strengite (FePO <sub>4</sub> *2H <sub>2</sub> O)	0.00
Siderite (FeCO <sub>3</sub> )	< 0.001
Halite (NaCl)	0.292
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	< 0.001
Iron sulfide (FeS)	< 0.001

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

Calcite (CaCO <sub>3</sub> )	-0.0118
Aragonite (CaCO <sub>3</sub> )	-0.0133
Witherite (BaCO <sub>3</sub> )	-25.21
Strontianite (SrCO <sub>3</sub> )	-0.843
Calcium oxalate (CaC <sub>2</sub> O <sub>4</sub> )	-0.00447
Magnesite (MgCO <sub>3</sub> )	-0.0277
Anhydrite (CaSO <sub>4</sub> )	-61.35
Gypsum (CaSO <sub>4</sub> *2H <sub>2</sub> O)	-9.72
Barite (BaSO <sub>4</sub> )	-0.0115
Celestite (SrSO <sub>4</sub> )	-143.63
Fluorite (CaF <sub>2</sub> )	-2.02
Calcium phosphate	>-0.001
Hydroxyapatite	-217.89
Silica (SiO <sub>2</sub> )	-18.41
Brucite (Mg(OH) <sub>2</sub> )	< 0.001
Magnesium silicate	-72.92
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> )	-0.240
Halite (NaCl)	-61993
Thenardite (Na <sub>2</sub> SO <sub>4</sub> )	-87855
Iron sulfide (FeS)	-1.32

**SIMPLE INDICES**

Langelier	-1.27
Ryznar	8.40
Puckorius	8.45
Larson-Skold Index	26416
Stiff Davis Index	-1.39
Oddo-Tomson	-2.37

**BOUND IONS**

Calcium	7234	7021
Barium	0.204	0.204
Carbonate	0.0459	< 0.001
Phosphate	0.00	0.00
Sulfate	1400	324.62

**TOTAL****FREE****OPERATING CONDITIONS**

Temperature (°F)	47.90
Time(secs)	0.00

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# DownHole SAT™ Water Analysis Report



JACAM LABORATORIES

## SYSTEM IDENTIFICATION

LINN OPERATING  
KELLAM 1  
MICHAEL BELLOMY  
FLOWLINE

Sample ID#: 3076  
ID: 117372  
Report Date: 01-22-2016  
Sample Date: 01-11-2016  
at 0000

## WATER CHEMISTRY

### CATIONS

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Sodium(as Na)	76197
Potassium(as K)	456.90
Lithium(as Li)	6.40
Iron(as Fe)	0.935
Field Iron(as Fe)	0.00
Ammonia(as NH <sub>3</sub> )	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	0.424
Zinc(as Zn)	1.02
Lead(as Pb)	0.00

### ANIONS

Chloride(as Cl)	157400
Sulfate(as SO <sub>4</sub> )	1400
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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)	0.500
Fluoride(as F)	0.00
Nitrate(as NO <sub>3</sub> )	0.00
Boron(as B)	0.291

### PARAMETERS

Temperature(°F)	47.90
Sample pH	5.85
T.D.S.	231948
Conductivity:	421386
Resistivity:	2.37

## 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	0.0108	-0.0116	0.704	-65.03	0.928	-13.69	0.847	-0.0218	0.253	-146.99	< 0.001	-0.233	0.00259	-1.30	0.0645	0.00391
65.45	0.00	0.0149	-0.0102	0.628	-84.19	0.801	-40.28	0.507	-0.117	0.218	-164.39	< 0.001	-0.192	0.00250	-1.32	0.203	0.00391
80.91	0.00	0.0195	-0.00908	0.593	-90.07	0.706	-62.28	0.323	-0.253	0.199	-172.42	0.00105	-0.160	0.00239	-1.34	0.0789	0.00391
96.36	0.00	0.0245	-0.00818	0.590	-84.83	0.635	-79.83	0.217	-0.434	0.189	-175.13	0.00146	-0.135	0.00224	-1.36	0.103	0.00391
111.82	0.00	0.0296	-0.00745	0.615	-71.53	0.624	-77.87	0.153	-0.666	0.181	-175.47	0.00194	-0.115	0.00209	-1.39	0.111	0.00391
127.27	0.00	0.0349	-0.00687	0.667	-53.42	0.650	-65.24	0.109	-0.977	0.174	-176.37	0.00251	-0.0995	0.00194	-1.42	0.0991	0.00391
142.73	0.00	0.0402	-0.00640	0.752	-33.36	0.672	-55.73	0.0792	-1.39	0.166	-178.03	0.00315	-0.0869	0.00182	-1.45	0.0855	0.00391
158.18	0.00	0.0450	-0.00603	0.876	-13.55	0.690	-48.56	0.0579	-1.94	0.158	-180.41	0.00383	-0.0767	0.00170	-1.48	0.0785	0.00391
173.64	0.00	0.0487	-0.00574	1.05	4.54	0.704	-43.21	0.0428	-2.66	0.151	-183.51	0.00448	-0.0685	0.00158	-1.52	0.0718	0.00391
189.09	0.00	0.0508	-0.00553	1.30	20.16	0.715	-39.27	0.0319	-3.57	0.143	-187.34	0.00504	-0.0618	0.00146	-1.55	0.0299	0.00391
204.55	0.00	0.0509	-0.00539	1.65	33.07	0.722	-36.45	0.0241	-4.74	0.135	-191.93	0.00543	-0.0565	0.00135	-1.60	0.0215	0.00391
220.00	0.171	0.0480	-0.00550	2.11	44.27	0.721	-36.53	0.0181	-6.26	0.127	-201.29	0.00548	-0.0538	0.00139	-1.65	0.0286	0.00458
		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			

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.

