

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	_____	_____	_____	_____	_____



Relative Energy zone

~~CASEBEER INC.~~
ED WEBB
MCPHERSON KS

ARMSTRONG SWD
WATER TANK

Report Date: 05-19-2020 Sampled: 05-19-2020 at 0000
Sample #: 5659 Sample ID: 258838

CATIONS

Calcium (as Ca)	1513
Magnesium (as Mg)	386.00
Barium (as Ba)	0.352
Strontium (as Sr)	76.02
Sodium (as Na)	12066
Potassium (as K)	71.15
Lithium (as Li)	1.68
Ammonia (as NH ₃)	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	1.31
Manganese (as Mn)	0.231
Zinc (as Zn)	21.17
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	22400
Sulfate (as SO ₄)	75.00
Bromine (as Br)	0.00
Dissolved CO ₂ (as CO ₂)	60.00
Bicarbonate (as HCO ₃)	146.40
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)	20.00
Fluoride (as F)	0.00
Nitrate (as NO ₃)	0.00
Boron (as B)	5.17

PARAMETERS

Calculated T.D.S.	37498
Molar Conductivity	47611
Resistivity	21.00
Sp.Gr.(g/mL)	1.02
Pressure(atm)	1.00
pCO ₂ (atm)	0.0239
pH ₂ S(atm)	0.0125
Temperature (°F)	74.50
pH	6.52

CORROSION RATE PREDICTION

CO ₂ - H ₂ S Rate(mpy)	0.0495
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COMMENTS

MCPHERSON KS

JACAM LABORATORIES

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



DownHole Rx

DEPOSITION POTENTIAL INDICATORS

Relative Energy, Inc.

CASEBEER INC.
ED WEBB
MCPHERSON KS

ARMSTRONG SWD
WATER TANK

Report Date: 05-19-2020 Sampled: 05-19-2020 at 0000
Sample #: 5659 Sample ID: 258838

SATURATION RATIO as IAP/Ksp

Calcite (CaCO ₃)	0.42
Aragonite (CaCO ₃)	0.39
Witherite (BaCO ₃)	0.00
Strontianite (SrCO ₃)	0.06
Calcium oxalate (CaC ₂ O ₄)	0.00
Magnesite (MgCO ₃)	0.09
Anhydrite (CaSO ₄)	0.02
Gypsum (CaSO ₄ *2H ₂ O)	0.03
Barite (BaSO ₄)	0.43
Celestite (SrSO ₄)	0.07
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)	0.00
Strengite (FePO ₄ *2H ₂ O)	0.00
Siderite (FeCO ₃)	0.55
Halite (NaCl)	0.00
Thenardite (Na ₂ SO ₄)	0.00
Iron sulfide (FeS)	1.70

MOMENTARY EXCESS (Lbs/1000 Barrels)

Calcite (CaCO ₃)	-0.0439
Aragonite (CaCO ₃)	-0.0496
Witherite (BaCO ₃)	-17.82
Strontianite (SrCO ₃)	-0.690
Calcium oxalate (CaC ₂ O ₄)	-0.0378
Magnesite (MgCO ₃)	-0.267
Anhydrite (CaSO ₄)	-806.60
Gypsum (CaSO ₄ *2H ₂ O)	-621.58
Barite (BaSO ₄)	-0.276
Celestite (SrSO ₄)	-119.79
Fluorite (CaF ₂)	-6.67
Calcium phosphate	>-0.001
Hydroxyapatite	-332.42
Silica (SiO ₂)	-38.27
Brucite (Mg(OH) ₂)	< 0.001
Magnesium silicate	-102.68
Iron hydroxide (Fe(OH) ₃)	< 0.001
Strengite (FePO ₄ *2H ₂ O)	>-0.001
Siderite (FeCO ₃)	-0.0282
Halite (NaCl)	-174229
Thenardite (Na ₂ SO ₄)	-65504
Iron sulfide (FeS)	0.0658

SIMPLE INDICES

Langelier	-0.246
Ryznar	7.01
Puckorius	5.95
Larson-Skold Index	263.70
Stiff Davis Index	-0.777
Oddo-Tomson	-0.935

BOUND IONS

Calcium	1548	1532
Barium	0.360	0.360
Carbonate	0.472	0.0552
Phosphate	0.00	0.00
Sulfate	76.72	46.29

TOTAL

FREE

OPERATING CONDITIONS

Temperature (°F) 74.50
Time(secs) 0.00

JACAM LABORATORIES

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

DownHole SAT™ Water Analysis Report

SYSTEM IDENTIFICATION

CASEBEER INC.
ARMSTRONG SWD
ED WEBB
WATER TANK
MCPHERSON KS

Sample ID#: 5659
Sample ID: 258838
Sample Date: 05-19-2020 at 0000
Report Date: 05-19-2020

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	1513
Magnesium(as Mg)	386.00
Barium(as Ba)	0.352
Strontium(as Sr)	76.02
Sodium(as Na)	12066
Potassium(as K)	71.15
Lithium(as Li)	1.68
Iron(as Fe)	1.31
Field Iron(as Fe)	0.00
Ammonia(as NH ₃)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	0.231
Zinc(as Zn)	21.17
Lead(as Pb)	0.00

ANIONS

Chloride(as Cl)	22400
Sulfate(as SO ₄)	75.00
Bromine(as Br)	0.00
Dissolved CO ₂ (as CO ₂)	60.00
Bicarbonate(as HCO ₃)	146.40
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)	20.00
Fluoride(as F)	0.00
Nitrate(as NO ₃)	0.00
Boron(as B)	5.17

PARAMETERS

Temperature(°F)	74.50	Sample pH	6.52
Conductivity	47611	Sp.Gr.(g/mL)	1.02
Resistivity	21.00	T.D.S.	37498



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	0.185	-0.0757	0.0205	-796.43	0.0353	-577.45	0.868	-0.0322	0.0742	-113.77	0.203	-0.0716	5.81	0.140	0.0528	0.0239
65.45	0.00	0.241	-0.0619	0.0193	-813.01	0.0322	-607.80	0.550	-0.173	0.0676	-119.06	0.296	-0.0504	4.43	0.129	0.114	0.0239
80.91	0.00	0.304	-0.0504	0.0192	-794.92	0.0298	-629.08	0.370	-0.359	0.0653	-119.61	0.415	-0.0338	3.50	0.117	0.0752	0.0239
96.36	0.00	0.373	-0.0408	0.0200	-747.92	0.0282	-641.79	0.262	-0.588	0.0651	-117.64	0.565	-0.0206	2.85	0.104	0.103	0.0239
111.82	0.00	0.448	-0.0326	0.0219	-679.43	0.0291	-608.86	0.194	-0.860	0.0658	-114.69	0.748	-0.00993	2.39	0.0909	0.0316	0.0239
127.27	0.00	0.525	-0.0258	0.0248	-597.39	0.0317	-551.50	0.146	-1.20	0.0662	-112.25	0.960	-0.00133	2.00	0.0762	0.0665	0.0239
142.73	0.00	0.600	-0.0201	0.0292	-509.21	0.0342	-503.83	0.110	-1.63	0.0661	-110.40	1.20	0.00557	1.67	0.0594	0.0748	0.0239
158.18	0.00	0.669	-0.0156	0.0354	-421.24	0.0365	-464.20	0.0841	-2.17	0.0657	-109.10	1.45	0.0110	1.38	0.0398	0.0808	0.0239
173.64	0.00	0.729	-0.0120	0.0441	-338.42	0.0386	-431.31	0.0646	-2.82	0.0649	-108.31	1.71	0.0152	1.14	0.0169	0.0762	0.0239
189.09	0.00	0.777	-0.00945	0.0563	-264.13	0.0406	-404.13	0.0500	-3.61	0.0639	-108.01	1.96	0.0183	0.929	-0.0103	0.0298	0.0239
204.55	0.00	0.811	-0.00772	0.0735	-200.27	0.0423	-381.86	0.0390	-4.55	0.0626	-108.18	2.19	0.0204	0.752	-0.0425	0.0162	0.0239
220.00	0.171	0.783	-0.00882	0.0964	-151.59	0.0431	-373.21	0.0301	-5.75	0.0601	-110.77	2.26	0.0202	0.658	-0.0639	0.0191	0.0280

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.

