KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION

1298780

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 # 34344
Name: Culbreath Oil & Gas Company, Inc.
Address 1: 3501 S YALE AVE
Address 2:
City: TULSA State: OK Zip: 74135 + 8014
Contact Person: Kevin Howard
Phone: (918) 749-3508
Lease Name: Racette
Well Number: 3-10

API No.: 15-109-21246-00-00
Permit No: D31907.0
Reporting Year: 2015
(January 1 to December 31)

SW - SW - NE - NW (Q/Q/Q/Q) Sec. 10 Twp. 12 S. R. 32 ☐ E ☑ W
4205 feet from ☐ N / ☑ S Line of Section
3815 feet from ☑ E / ☐ W Line of Section
County: Logan

I. Injection Fluid:

Type *(Pick one)*: ☐ Fresh Water ☐ Treated Brine ☑ Untreated Brine ☐ Water/Brine
Source: ☑ Produced Water ☐ Other *(Attach list)*
Quality: Total Dissolved Solids: 50000 mg/l Specific Gravity: 1.028 Additives: None
(Attach water analysis, if available)

II. Well Data:

Maximum Authorized Injection Pressure: 0 psi Injection Zone: Arbuckle
Maximum Authorized Injection Rate: 20000 barrels per day
Total Number of Enhanced Recovery Injection Wells Covered by this Permit: 0 *(Include TA's)*

III.

Month:	Total Fluid Injected BBL	Maximum Fluid Pressure	Total Gas Injected MCF	Maximum Gas Pressure	# Days of Injection
January	10607	0	0		31
February	8753	0	0		28
March	9942	0	0		31
April	9350	0	0		30
May	8820	0	0		31
June	8802	0	0		30
July	8506	0	0		31
August	9222	0	0		31
September	8577	0	0		30
October	7567	0	0		31
November	6934	0	0		30
December	9423	0	0		31
TOTAL	106503		0		

Submitted Electronically

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **280483**
Sample ID: **AF09772**
Login Batch: **151117131249**
Collection Date: **11/10/2015**
Receive Date: **11/17/2015**
Report Date: **11/19/2015**

Region: **Not Available**
Location: **Scott County, KS**
System: **Production System**
Equipment: **Well A C Felt**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**238**	mg/L
Dissolved H2S	**431.8**	mg/L
pH	**8.5**	
Pressure	**10**	psi
Temperature	**69**	° F

Analyses	Result	Unit
Bicarbonate	**786**	mg/L
Conductivity	**82107**	µS - cm3
Ionic Strength	**0.95**	
Resistivity	**0.122**	ohms - m
Specific Gravity	**1.029**	
Total Dissolved Solids	**52548.91**	mg/L

Cations	Result	Unit
Iron	**0.256**	mg/L
Manganese	**0.017**	mg/L
Barium	**0.019**	mg/L
Strontium	**33.97**	mg/L
Calcium	**651.1**	mg/L
Magnesium	**409.3**	mg/L
Sodium	**18843.25**	mg/L

Anions	Result	Unit
Chloride	**28662**	mg/L
Sulfate	**3163**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.93**
Barite BaSO4 SI	**-0.49**
Calcite CaCO3 PTB	**288.0**
Calcite CaCO3 SI	**1.19**
Celestite SrSO4 SI	**0.00**
Gypsum CaSO4 SI	**-0.60**
Hemihydrate CaSO4 SI	**-0.56**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279917**
Sample ID: **AF03985**
Login Batch: **151109090205**
Collection Date: **10/29/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Boyd 1-3**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**194**	mg/L
Dissolved H2S	**3.4**	mg/L
pH	**7.0**	
Pressure	**10**	psi
Temperature	**69**	° F

Analyses	Result	Unit
Bicarbonate	**234**	mg/L
Conductivity	**160992**	µS - cm3
Ionic Strength	**1.81**	
Resistivity	**0.062**	ohms - m
Specific Gravity	**1.074**	
Total Dissolved Solids	**103045.2**	mg/L

Cations	Result	Unit
Iron	**10.17**	mg/L
Manganese	**0.142**	mg/L
Barium	**0.116**	mg/L
Strontium	**65.55**	mg/L
Calcium	**828**	mg/L
Magnesium	**279**	mg/L
Sodium	**38831.18**	mg/L

Anions	Result	Unit
Chloride	**60300**	mg/L
Sulfate	**2497**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.95**
Barite BaSO4 SI	**-0.03**
Calcite CaCO3 SI	**-0.94**
Celestite SrSO4 PTB	**4.4**
Celestite SrSO4 SI	**0.04**
Gypsum CaSO4 SI	**-0.72**
Hemihydrate CaSO4 SI	**-0.73**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279909**
Sample ID: **AF03973**
Login Batch: **151109090205**
Collection Date: **11/04/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Logan, KS**
System: **Production System**
Equipment: **Well Boyd 2-3**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**176**	mg/L
Dissolved H2S	**5**	mg/L
pH	**6.5**	
Pressure	**10**	psi
Temperature	**75**	° F

Analyses	Result	Unit
Bicarbonate	**273**	mg/L
Conductivity	**65914**	µS - cm3
Ionic Strength	**0.79**	
Resistivity	**0.152**	ohms - m
Specific Gravity	**1.028**	
Total Dissolved Solids	**42194.98**	mg/L

Cations	Result	Unit
Iron	**9.853**	mg/L
Manganese	**0.138**	mg/L
Barium	**0.084**	mg/L
Strontium	**35.26**	mg/L
Calcium	**1565**	mg/L
Magnesium	**309.8**	mg/L
Sodium	**14085.84**	mg/L

Anions	Result	Unit
Chloride	**23562**	mg/L
Sulfate	**2354**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.63**
Barite BaSO4 PTB	**0.0**
Barite BaSO4 SI	**0.07**
Calcite CaCO3 SI	**-0.75**
Celestite SrSO4 SI	**-0.07**
Gypsum CaSO4 SI	**-0.33**
Hemihydrate CaSO4 SI	**-0.27**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **280479**
Sample ID: **AF09768**
Login Batch: **151117131249**
Collection Date: **11/09/2015**
Receive Date: **11/17/2015**
Report Date: **11/19/2015**

Region: **Not Available**
Location: **Scott County, KS**
System: **Production System**
Equipment: **Well Brothers 1**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**229**	mg/L
Dissolved H2S	**161.5**	mg/L
pH	**9**	
Pressure	**10**	psi
Temperature	**67**	° F

Analyses	Result	Unit
Bicarbonate	**976**	mg/L
Conductivity	**82861**	µS - cm3
Ionic Strength	**0.95**	
Resistivity	**0.121**	ohms - m
Specific Gravity	**1.032**	
Total Dissolved Solids	**53031.42**	mg/L

Cations	Result	Unit
Iron	**0.517**	mg/L
Manganese	**0.007**	mg/L
Barium	**0.225**	mg/L
Strontium	**43.7**	mg/L
Calcium	**689**	mg/L
Magnesium	**302.7**	mg/L
Sodium	**19224.27**	mg/L

Anions	Result	Unit
Chloride	**29680**	mg/L
Sulfate	**2115**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-1.08**
Barite BaSO4 PTB	**0.1**
Barite BaSO4 SI	**0.44**
Calcite CaCO3 PTB	**428.3**
Calcite CaCO3 SI	**1.79**
Celestite SrSO4 SI	**-0.06**
Gypsum CaSO4 SI	**-0.74**
Hemihydrate CaSO4 SI	**-0.69**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

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Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279932**
Sample ID: **AF04000**
Login Batch: **151109090205**
Collection Date: **11/03/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Logan County, KS**
System: **Production System**
Equipment: **Well Byron 1-31**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**176**	mg/L
Dissolved H2S	**10.2**	mg/L
pH	**9.0**	
Pressure	**10**	psi
Temperature	**82**	° F

Analyses	Result	Unit
Bicarbonate	**527**	mg/L
Conductivity	**81853**	µS - cm3
Ionic Strength	**0.95**	
Resistivity	**0.122**	ohms - m
Specific Gravity	**1.034**	
Total Dissolved Solids	**52387.14**	mg/L

Cations	Result	Unit
Iron	**1.158**	mg/L
Manganese	**0.017**	mg/L
Barium	**0.033**	mg/L
Strontium	**16.44**	mg/L
Calcium	**436**	mg/L
Magnesium	**223.3**	mg/L
Sodium	**19076.19**	mg/L

Anions	Result	Unit
Chloride	**26226**	mg/L
Sulfate	**5881**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.77**
Barite BaSO4 SI	**-0.06**
Calcite CaCO3 PTB	**217.4**
Calcite CaCO3 SI	**1.47**
Celestite SrSO4 SI	**-0.05**
Gypsum CaSO4 SI	**-0.52**
Hemihydrate CaSO4 SI	**-0.49**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **283573**
Sample ID: **AF13795**
Login Batch: **151123094658-HAYS**
Collection Date: **11/16/2015**
Receive Date: **11/23/2015**
Report Date: **11/24/2015**

Region: **Not Available**
Location: **Scott County, KS**
System: **Production System**
Equipment: **Well Captain Kirk 1**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**3872**	mg/L
Dissolved H2S	**49**	mg/L
pH	**5.0**	
Pressure	**40**	psi
Temperature	**69**	° F

Analyses	Result	Unit
Bicarbonate	**1**	mg/L
Conductivity	**84362**	µS - cm3
Ionic Strength	**1.00**	
Resistivity	**0.119**	ohms - m
Specific Gravity	**1.041**	
Total Dissolved Solids	**54502.13**	mg/L

Cations	Result	Unit
Iron	**503.3**	mg/L
Manganese	**7.046**	mg/L
Barium	**0**	mg/L
Strontium	**30.1**	mg/L
Calcium	**1089**	mg/L
Magnesium	**369.7**	mg/L
Sodium	**18765.98**	mg/L

Anions	Result	Unit
Chloride	**29554**	mg/L
Sulfate	**4182**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.61**
Calcite CaCO3 SI	**-5.01**
Celestite SrSO4 PTB	**1.3**
Celestite SrSO4 SI	**0.03**
Gypsum CaSO4 SI	**-0.29**
Hemihydrate CaSO4 SI	**-0.25**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **280480**
Sample ID: **AF09769**
Login Batch: **151117131249**
Collection Date: **11/09/2015**
Receive Date: **11/17/2015**
Report Date: **11/19/2015**

Region: **Not Available**
Location: **Scott County, KS**
System: **Production System**
Equipment: **Well Dale 1**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**361**	mg/L
Dissolved H2S	**249.9**	mg/L
pH	**8**	
Pressure	**50**	psi
Temperature	**72**	° F

Analyses	Result	Unit
Bicarbonate	**615**	mg/L
Conductivity	**91270**	µS - cm3
Ionic Strength	**1.06**	
Resistivity	**0.110**	ohms - m
Specific Gravity	**1.030**	
Total Dissolved Solids	**58413.77**	mg/L

Cations	Result	Unit
Iron	**1.048**	mg/L
Manganese	**0.094**	mg/L
Barium	**0.015**	mg/L
Strontium	**33.49**	mg/L
Calcium	**797**	mg/L
Magnesium	**361.5**	mg/L
Sodium	**21020.62**	mg/L

Anions	Result	Unit
Chloride	**31734**	mg/L
Sulfate	**3851**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.76**
Barite BaSO4 SI	**-0.57**
Calcite CaCO3 PTB	**162.8**
Calcite CaCO3 SI	**0.65**
Celestite SrSO4 PTB	**2.2**
Celestite SrSO4 SI	**0.04**
Gypsum CaSO4 SI	**-0.46**
Hemihydrate CaSO4 SI	**-0.43**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **280481**
Sample ID: **AF09770**
Login Batch: **151117131249**
Collection Date: **11/09/2015**
Receive Date: **11/17/2015**
Report Date: **11/19/2015**

Region: **Not Available**
Location: **Scott County, KS**
System: **Production System**
Equipment: **Well David 1-32**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**211**	mg/L
Dissolved H2S	**15.3**	mg/L
pH	**8**	
Pressure	**20**	psi
Temperature	**60**	° F

Analyses	Result	Unit
Bicarbonate	**1122**	mg/L
Conductivity	**114440**	µS - cm3
Ionic Strength	**1.31**	
Resistivity	**0.087**	ohms - m
Specific Gravity	**1.044**	
Total Dissolved Solids	**73255.83**	mg/L

Cations	Result	Unit
Iron	**14.29**	mg/L
Manganese	**0.2**	mg/L
Barium	**0.534**	mg/L
Strontium	**57.22**	mg/L
Calcium	**1651**	mg/L
Magnesium	**327.3**	mg/L
Sodium	**26205.29**	mg/L

Anions	Result	Unit
Chloride	**43357**	mg/L
Sulfate	**521**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-1.39**
Barite BaSO4 PTB	**0.1**
Barite BaSO4 SI	**0.11**
Calcite CaCO3 PTB	**412.8**
Calcite CaCO3 SI	**1.04**
Celestite SrSO4 SI	**-0.64**
Gypsum CaSO4 SI	**-1.04**
Hemihydrate CaSO4 SI	**-1.02**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279910**
Sample ID: **AF03974**
Login Batch: **151109090205**
Collection Date: **11/04/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Logan, KS**
System: **Production System**
Equipment: **Well Denny 2-11**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**141**	mg/L
Dissolved H2S	**Not Detected**	mg/L
pH	**7.0**	
Pressure	**10**	psi
Temperature	**79**	° F

Analyses	Result	Unit
Bicarbonate	**264**	mg/L
Conductivity	**75318**	µS - cm3
Ionic Strength	**0.88**	
Resistivity	**0.133**	ohms - m
Specific Gravity	**1.032**	
Total Dissolved Solids	**48203.9**	mg/L

Cations	Result	Unit
Iron	**0.118**	mg/L
Manganese	**0.083**	mg/L
Barium	**0.156**	mg/L
Strontium	**42.6**	mg/L
Calcium	**1119**	mg/L
Magnesium	**301.1**	mg/L
Sodium	**17025.84**	mg/L

Anions	Result	Unit
Chloride	**27806**	mg/L
Sulfate	**1645**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.90**
Barite BaSO4 PTB	**0.0**
Barite BaSO4 SI	**0.13**
Calcite CaCO3 SI	**-0.42**
Celestite SrSO4 SI	**-0.15**
Gypsum CaSO4 SI	**-0.63**
Hemihydrate CaSO4 SI	**-0.59**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **280478**
Sample ID: **AF09767**
Login Batch: **151117131249**
Collection Date: **11/09/2015**
Receive Date: **11/17/2015**
Report Date: **11/19/2015**

Region: **Not Available**
Location: **Scott County, KS**
System: **Production System**
Equipment: **Well Farr 1-11**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**158**	mg/L
Dissolved H2S	**34**	mg/L
pH	**8**	
Pressure	**30**	psi
Temperature	**65**	° F

Analyses	Result	Unit
Bicarbonate	**215**	mg/L
Conductivity	**109272**	µS - cm3
Ionic Strength	**1.28**	
Resistivity	**0.092**	ohms - m
Specific Gravity	**1.042**	
Total Dissolved Solids	**69934.51**	mg/L

Cations	Result	Unit
Iron	**0.366**	mg/L
Manganese	**0.066**	mg/L
Barium	**0.034**	mg/L
Strontium	**31.28**	mg/L
Calcium	**1241**	mg/L
Magnesium	**435.1**	mg/L
Sodium	**24970.66**	mg/L

Anions	Result	Unit
Chloride	**38703**	mg/L
Sulfate	**4338**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.57**
Barite BaSO4 SI	**-0.21**
Calcite CaCO3 PTB	**29.9**
Calcite CaCO3 SI	**0.25**
Celestite SrSO4 SI	**0.00**
Gypsum CaSO4 SI	**-0.26**
Hemihydrate CaSO4 SI	**-0.24**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279928**
Sample ID: **AF03994**
Login Batch: **151109090205**
Collection Date: **11/02/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Fromholtz 1-14**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**246**	mg/L
Dissolved H2S	**25.5**	mg/L
pH	**7.5**	
Pressure	**10**	psi
Temperature	**75**	° F

Analyses	Result	Unit
Bicarbonate	**303**	mg/L
Conductivity	**98684**	µS - cm3
Ionic Strength	**1.16**	
Resistivity	**0.101**	ohms - m
Specific Gravity	**1.043**	
Total Dissolved Solids	**63159.42**	mg/L

Cations	Result	Unit
Iron	**1.368**	mg/L
Manganese	**0.019**	mg/L
Barium	**0.091**	mg/L
Strontium	**50.67**	mg/L
Calcium	**1539**	mg/L
Magnesium	**396.4**	mg/L
Sodium	**22153.87**	mg/L

Anions	Result	Unit
Chloride	**35761**	mg/L
Sulfate	**2954**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.58**
Barite BaSO4 PTB	**0.0**
Barite BaSO4 SI	**0.04**
Calcite CaCO3 PTB	**23.1**
Calcite CaCO3 SI	**0.13**
Celestite SrSO4 PTB	**5.6**
Celestite SrSO4 SI	**0.08**
Gypsum CaSO4 SI	**-0.31**
Hemihydrate CaSO4 SI	**-0.29**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279915**
Sample ID: **AF03983**
Login Batch: **151109090205**
Collection Date: **10/29/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Goldenbear 1-33**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**150**	mg/L
Dissolved H2S	**5.1**	mg/L
pH	**7.5**	
Pressure	**10**	psi
Temperature	**66**	° F

Analyses	Result	Unit
Bicarbonate	**244**	mg/L
Conductivity	**88825**	µS - cm3
Ionic Strength	**1.04**	
Resistivity	**0.113**	ohms - m
Specific Gravity	**1.036**	
Total Dissolved Solids	**56848.48**	mg/L

Cations	Result	Unit
Iron	**0.155**	mg/L
Manganese	**0.091**	mg/L
Barium	**0.117**	mg/L
Strontium	**43.86**	mg/L
Calcium	**1362**	mg/L
Magnesium	**343.4**	mg/L
Sodium	**20047.86**	mg/L

Anions	Result	Unit
Chloride	**32684**	mg/L
Sulfate	**2123**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.81**
Barite BaSO4 PTB	**0.0**
Barite BaSO4 SI	**0.11**
Calcite CaCO3 SI	**-0.07**
Celestite SrSO4 SI	**-0.09**
Gypsum CaSO4 SI	**-0.48**
Hemihydrate CaSO4 SI	**-0.44**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279908**
Sample ID: **AF03972**
Login Batch: **151109090205**
Collection Date: **11/04/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Logan, KS**
System: **Production System**
Equipment: **Well H Dreiling 1-28**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**97**	mg/L
Dissolved H2S	**12**	mg/L
pH	**7.0**	
Pressure	**10**	psi
Temperature	**70**	° F

Analyses	Result	Unit
Bicarbonate	**342**	mg/L
Conductivity	**178679**	µS - cm3
Ionic Strength	**1.97**	
Resistivity	**0.056**	ohms - m
Specific Gravity	**1.078**	
Total Dissolved Solids	**114355.2**	mg/L

Cations	Result	Unit
Iron	**0.427**	mg/L
Manganese	**0.075**	mg/L
Barium	**0.875**	mg/L
Strontium	**53.64**	mg/L
Calcium	**227.9**	mg/L
Magnesium	**81.17**	mg/L
Sodium	**44412.16**	mg/L

Anions	Result	Unit
Chloride	**68463**	mg/L
Sulfate	**774**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-2.00**
Barite BaSO4 PTB	**0.3**
Barite BaSO4 SI	**0.33**
Calcite CaCO3 SI	**-1.34**
Celestite SrSO4 SI	**-0.55**
Gypsum CaSO4 SI	**-1.79**
Hemihydrate CaSO4 SI	**-1.81**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279914**
Sample ID: **AF03982**
Login Batch: **151109090205**
Collection Date: **10/29/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Hockersmith 1-34**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**194**	mg/L
Dissolved H2S	**34**	mg/L
pH	**8.0**	
Pressure	**20**	psi
Temperature	**74**	° F

Analyses	Result	Unit
Bicarbonate	**420**	mg/L
Conductivity	**135691**	µS - cm3
Ionic Strength	**1.52**	
Resistivity	**0.074**	ohms - m
Specific Gravity	**1.061**	
Total Dissolved Solids	**86842.13**	mg/L

Cations	Result	Unit
Iron	**0.092**	mg/L
Manganese	**0.019**	mg/L
Barium	**1.25**	mg/L
Strontium	**67.76**	mg/L
Calcium	**511.4**	mg/L
Magnesium	**201.1**	mg/L
Sodium	**33013.51**	mg/L

Anions	Result	Unit
Chloride	**51217**	mg/L
Sulfate	**1410**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-1.38**
Barite BaSO4 PTB	**0.6**
Barite BaSO4 SI	**0.79**
Calcite CaCO3 PTB	**37.7**
Calcite CaCO3 SI	**0.19**
Celestite SrSO4 SI	**-0.15**
Gypsum CaSO4 SI	**-1.14**
Hemihydrate CaSO4 SI	**-1.14**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279916**
Sample ID: **AF03984**
Login Batch: **151109090205**
Collection Date: **10/29/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well James 1-4**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**238**	mg/L
Dissolved H2S	**6.8**	mg/L
pH	**7.0**	
Pressure	**10**	psi
Temperature	**71**	° F

Analyses	Result	Unit
Bicarbonate	**205**	mg/L
Conductivity	**141550**	µS - cm3
Ionic Strength	**1.62**	
Resistivity	**0.071**	ohms - m
Specific Gravity	**1.067**	
Total Dissolved Solids	**90601.79**	mg/L

Cations	Result	Unit
Iron	**9.417**	mg/L
Manganese	**0.132**	mg/L
Barium	**0.061**	mg/L
Strontium	**40.1**	mg/L
Calcium	**1055**	mg/L
Magnesium	**306**	mg/L
Sodium	**33559.08**	mg/L

Anions	Result	Unit
Chloride	**51814**	mg/L
Sulfate	**3613**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.69**
Barite BaSO4 SI	**-0.13**
Calcite CaCO3 SI	**-0.85**
Celestite SrSO4 SI	**0.00**
Gypsum CaSO4 SI	**-0.44**
Hemihydrate CaSO4 SI	**-0.45**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279929**
Sample ID: **AF03997**
Login Batch: **151109090205**
Collection Date: **11/03/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Logan County, KS**
System: **Production System**
Equipment: **Well KGB 1-21**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**1760**	mg/L
Dissolved H2S	**8.5**	mg/L
pH	**4.5**	
Pressure	**10**	psi
Temperature	**75.5**	° F

Analyses	Result	Unit
Bicarbonate	**100**	mg/L
Conductivity	**93039**	µS - cm3
Ionic Strength	**1.09**	
Resistivity	**0.107**	ohms - m
Specific Gravity	**1.043**	
Total Dissolved Solids	**59556.72**	mg/L

Cations	Result	Unit
Iron	**11.58**	mg/L
Manganese	**0.162**	mg/L
Barium	**0.125**	mg/L
Strontium	**28.25**	mg/L
Calcium	**1010**	mg/L
Magnesium	**341.5**	mg/L
Sodium	**21258.10**	mg/L

Anions	Result	Unit
Chloride	**32086**	mg/L
Sulfate	**4721**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.55**
Barite BaSO4 PTB	**0.0**
Barite BaSO4 SI	**0.40**
Calcite CaCO3 SI	**-3.51**
Celestite SrSO4 PTB	**1.8**
Celestite SrSO4 SI	**0.04**
Gypsum CaSO4 SI	**-0.28**
Hemihydrate CaSO4 SI	**-0.25**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279933**
Sample ID: **AF04001**
Login Batch: **151109090205**
Collection Date: **11/03/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Logan County, KS**
System: **Production System**
Equipment: **Well Marge 1-31**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**493**	mg/L
Dissolved H2S	**95.2**	mg/L
pH	**8.5**	
Pressure	**20**	psi
Temperature	**74**	° F

Analyses	Result	Unit
Bicarbonate	**898**	mg/L
Conductivity	**95080**	µS - cm3
Ionic Strength	**1.21**	
Resistivity	**0.105**	ohms - m
Specific Gravity	**1.045**	
Total Dissolved Solids	**60852.38**	mg/L

Cations	Result	Unit
Iron	**1.197**	mg/L
Manganese	**0.017**	mg/L
Barium	**2.027**	mg/L
Strontium	**132.9**	mg/L
Calcium	**3890**	mg/L
Magnesium	**996.1**	mg/L
Sodium	**17761.14**	mg/L

Anions	Result	Unit
Chloride	**35765**	mg/L
Sulfate	**1406**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.54**
Barite BaSO4 PTB	**1.1**
Barite BaSO4 SI	**1.02**
Calcite CaCO3 PTB	**458.9**
Calcite CaCO3 SI	**1.98**
Celestite SrSO4 PTB	**22.5**
Celestite SrSO4 SI	**0.13**
Gypsum CaSO4 SI	**-0.28**
Hemihydrate CaSO4 SI	**-0.26**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279930**
Sample ID: **AF03998**
Login Batch: **151109090205**
Collection Date: **11/03/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Logan County, KS**
System: **Production System**
Equipment: **Well Marius 1-15**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**202**	mg/L
Dissolved H2S	**91.8**	mg/L
pH	**8.5**	
Pressure	**150**	psi
Temperature	**73**	° F

Analyses	Result	Unit
Bicarbonate	**625**	mg/L
Conductivity	**78424**	µS - cm3
Ionic Strength	**0.92**	
Resistivity	**0.128**	ohms - m
Specific Gravity	**1.035**	
Total Dissolved Solids	**50192.58**	mg/L

Cations	Result	Unit
Iron	**0.523**	mg/L
Manganese	**0.533**	mg/L
Barium	**0.017**	mg/L
Strontium	**17.04**	mg/L
Calcium	**678.5**	mg/L
Magnesium	**180.5**	mg/L
Sodium	**18002.47**	mg/L

Anions	Result	Unit
Chloride	**24849**	mg/L
Sulfate	**5839**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.64**
Barite BaSO4 SI	**-0.30**
Calcite CaCO3 PTB	**237.0**
Calcite CaCO3 SI	**1.16**
Celestite SrSO4 SI	**-0.05**
Gypsum CaSO4 SI	**-0.34**
Hemihydrate CaSO4 SI	**-0.30**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **283572**
Sample ID: **AF13794**
Login Batch: **151123094658-HAYS**
Collection Date: **11/16/2015**
Receive Date: **11/23/2015**
Report Date: **11/24/2015**

Region: **Not Available**
Location: **Scott County, KS**
System: **Production System**
Equipment: **Well Muench 1-16**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**149**	mg/L
Dissolved H2S	**44**	mg/L
pH	**7.5**	
Pressure	**25**	psi
Temperature	**68**	° F

Analyses	Result	Unit
Bicarbonate	**244**	mg/L
Conductivity	**81357**	µS - cm3
Ionic Strength	**0.97**	
Resistivity	**0.123**	ohms - m
Specific Gravity	**1.035**	
Total Dissolved Solids	**52069.04**	mg/L

Cations	Result	Unit
Iron	**0.458**	mg/L
Manganese	**0.251**	mg/L
Barium	**0**	mg/L
Strontium	**35.04**	mg/L
Calcium	**1150**	mg/L
Magnesium	**361.3**	mg/L
Sodium	**18125.99**	mg/L

Anions	Result	Unit
Chloride	**27563**	mg/L
Sulfate	**4589**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.55**
Calcite CaCO3 SI	**-0.09**
Celestite SrSO4 PTB	**7.0**
Celestite SrSO4 SI	**0.15**
Gypsum CaSO4 SI	**-0.22**
Hemihydrate CaSO4 SI	**-0.17**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **280482**
Sample ID: **AF09771**
Login Batch: **151117131249**
Collection Date: **11/10/2015**
Receive Date: **11/17/2015**
Report Date: **11/19/2015**

Region: **Not Available**
Location: **Scott County, KS**
System: **Production System**
Equipment: **Well Pammenter 1-26**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**299**	mg/L
Dissolved H2S	**243.1**	mg/L
pH	**8**	
Pressure	**20**	psi
Temperature	**54**	° F

Analyses	Result	Unit
Bicarbonate	**625**	mg/L
Conductivity	**82429**	µS - cm3
Ionic Strength	**0.97**	
Resistivity	**0.121**	ohms - m
Specific Gravity	**1.031**	
Total Dissolved Solids	**52754.91**	mg/L

Cations	Result	Unit
Iron	**0.312**	mg/L
Manganese	**0.062**	mg/L
Barium	**0.018**	mg/L
Strontium	**35.46**	mg/L
Calcium	**866.9**	mg/L
Magnesium	**318.2**	mg/L
Sodium	**18712.96**	mg/L

Anions	Result	Unit
Chloride	**27654**	mg/L
Sulfate	**4542**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.76**
Barite BaSO4 SI	**-0.29**
Calcite CaCO3 PTB	**145.8**
Calcite CaCO3 SI	**0.55**
Celestite SrSO4 PTB	**7.2**
Celestite SrSO4 SI	**0.15**
Gypsum CaSO4 SI	**-0.34**
Hemihydrate CaSO4 SI	**-0.27**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279931**
Sample ID: **AF03999**
Login Batch: **151109090205**
Collection Date: **11/03/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Logan County, KS**
System: **Production System**
Equipment: **Well Prairie Dog 1-05**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**202**	mg/L
Dissolved H2S	**42.5**	mg/L
pH	**8.5**	
Pressure	**60**	psi
Temperature	**77**	° F

Analyses	Result	Unit
Bicarbonate	**283**	mg/L
Conductivity	**104106**	µS - cm3
Ionic Strength	**1.22**	
Resistivity	**0.096**	ohms - m
Specific Gravity	**1.044**	
Total Dissolved Solids	**66629.07**	mg/L

Cations	Result	Unit
Iron	**1.211**	mg/L
Manganese	**0.017**	mg/L
Barium	**0.163**	mg/L
Strontium	**51.62**	mg/L
Calcium	**1480**	mg/L
Magnesium	**420.8**	mg/L
Sodium	**23525.26**	mg/L

Anions	Result	Unit
Chloride	**37695**	mg/L
Sulfate	**3172**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.56**
Barite BaSO4 PTB	**0.0**
Barite BaSO4 SI	**0.29**
Calcite CaCO3 PTB	**113.7**
Calcite CaCO3 SI	**1.08**
Celestite SrSO4 PTB	**7.4**
Celestite SrSO4 SI	**0.10**
Gypsum CaSO4 SI	**-0.31**
Hemihydrate CaSO4 SI	**-0.30**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279919**
Sample ID: **AF03987**
Login Batch: **151109090205**
Collection Date: **10/29/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Racette 1**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**246**	mg/L
Dissolved H2S	**57.8**	mg/L
pH	**8.0**	
Pressure	**30**	psi
Temperature	**64**	° F

Analyses	Result	Unit
Bicarbonate	**429**	mg/L
Conductivity	**69479**	µS - cm3
Ionic Strength	**0.83**	
Resistivity	**0.144**	ohms - m
Specific Gravity	**1.029**	
Total Dissolved Solids	**44466.87**	mg/L

Cations	Result	Unit
Iron	**0.29**	mg/L
Manganese	**0.072**	mg/L
Barium	**0.427**	mg/L
Strontium	**52.35**	mg/L
Calcium	**1337**	mg/L
Magnesium	**403.6**	mg/L
Sodium	**15136.13**	mg/L

Anions	Result	Unit
Chloride	**25554**	mg/L
Sulfate	**1554**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.95**
Barite BaSO4 PTB	**0.2**
Barite BaSO4 SI	**0.64**
Calcite CaCO3 PTB	**134.7**
Calcite CaCO3 SI	**0.74**
Celestite SrSO4 SI	**-0.09**
Gypsum CaSO4 SI	**-0.58**
Hemihydrate CaSO4 SI	**-0.51**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279918**
Sample ID: **AF03986**
Login Batch: **151109090205**
Collection Date: **10/29/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Racette 2**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**185**	mg/L
Dissolved H2S	**3.4**	mg/L
pH	**7.5**	
Pressure	**30**	psi
Temperature	**70**	° F

Analyses	Result	Unit
Bicarbonate	**224**	mg/L
Conductivity	**128918**	µS - cm3
Ionic Strength	**1.44**	
Resistivity	**0.078**	ohms - m
Specific Gravity	**1.059**	
Total Dissolved Solids	**82508.97**	mg/L

Cations	Result	Unit
Iron	**1.492**	mg/L
Manganese	**0.034**	mg/L
Barium	**8.067**	mg/L
Strontium	**105.5**	mg/L
Calcium	**465.4**	mg/L
Magnesium	**195.8**	mg/L
Sodium	**31451.68**	mg/L

Anions	Result	Unit
Chloride	**49462**	mg/L
Sulfate	**595**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-1.81**
Barite BaSO4 PTB	**4.5**
Barite BaSO4 SI	**1.27**
Calcite CaCO3 SI	**-0.65**
Celestite SrSO4 SI	**-0.32**
Gypsum CaSO4 SI	**-1.54**
Hemihydrate CaSO4 SI	**-1.53**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279921**
Sample ID: **AF03989**
Login Batch: **151109090205**
Collection Date: **11/02/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Scheetz 1**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**70**	mg/L
Dissolved H2S	**3.4**	mg/L
pH	**9.0**	
Pressure	**30**	psi
Temperature	**63**	° F

Analyses	Result	Unit
Bicarbonate	**327**	mg/L
Conductivity	**111092**	µS - cm3
Ionic Strength	**1.28**	
Resistivity	**0.090**	ohms - m
Specific Gravity	**1.050**	
Total Dissolved Solids	**71099.09**	mg/L

Cations	Result	Unit
Iron	**0.253**	mg/L
Manganese	**0.035**	mg/L
Barium	**0.354**	mg/L
Strontium	**61.89**	mg/L
Calcium	**1162**	mg/L
Magnesium	**439**	mg/L
Sodium	**25815.56**	mg/L

Anions	Result	Unit
Chloride	**42345**	mg/L
Sulfate	**948**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-1.26**
Barite BaSO4 PTB	**0.1**
Barite BaSO4 SI	**0.18**
Calcite CaCO3 PTB	**146.4**
Calcite CaCO3 SI	**1.38**
Celestite SrSO4 SI	**-0.34**
Gypsum CaSO4 SI	**-0.93**
Hemihydrate CaSO4 SI	**-0.91**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279920**
Sample ID: **AF03988**
Login Batch: **151109090205**
Collection Date: **10/29/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Scheetz 2**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**246**	mg/L
Dissolved H2S	**86.7**	mg/L
pH	**8.0**	
Pressure	**60**	psi
Temperature	**62**	° F

Analyses	Result	Unit
Bicarbonate	**386**	mg/L
Conductivity	**106252**	µS - cm3
Ionic Strength	**1.23**	
Resistivity	**0.094**	ohms - m
Specific Gravity	**1.051**	
Total Dissolved Solids	**68002.06**	mg/L

Cations	Result	Unit
Iron	**0.762**	mg/L
Manganese	**0.13**	mg/L
Barium	**0.16**	mg/L
Strontium	**56.82**	mg/L
Calcium	**1350**	mg/L
Magnesium	**430.4**	mg/L
Sodium	**24346.79**	mg/L

Anions	Result	Unit
Chloride	**39968**	mg/L
Sulfate	**1463**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-1.01**
Barite BaSO4 PTB	**0.0**
Barite BaSO4 SI	**0.04**
Calcite CaCO3 PTB	**95.3**
Calcite CaCO3 SI	**0.52**
Celestite SrSO4 SI	**-0.19**
Gypsum CaSO4 SI	**-0.67**
Hemihydrate CaSO4 SI	**-0.65**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **280484**
Sample ID: **AF09773**
Login Batch: **151117131249**
Collection Date: **11/10/2015**
Receive Date: **11/17/2015**
Report Date: **11/19/2015**

Region: **Not Available**
Location: **Scott County, KS**
System: **Production System**
Equipment: **Well Simpson 1-26**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**246**	mg/L
Dissolved H2S	**170**	mg/L
pH	**9**	
Pressure	**10**	psi
Temperature	**64**	° F

Analyses	Result	Unit
Bicarbonate	**1113**	mg/L
Conductivity	**79391**	µS - cm3
Ionic Strength	**0.91**	
Resistivity	**0.126**	ohms - m
Specific Gravity	**1.028**	
Total Dissolved Solids	**50810.59**	mg/L

Cations	Result	Unit
Iron	**0.152**	mg/L
Manganese	**0.002**	mg/L
Barium	**0.239**	mg/L
Strontium	**35.86**	mg/L
Calcium	**542.8**	mg/L
Magnesium	**293.5**	mg/L
Sodium	**18490.04**	mg/L

Anions	Result	Unit
Chloride	**28043**	mg/L
Sulfate	**2292**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-1.16**
Barite BaSO4 PTB	**0.1**
Barite BaSO4 SI	**0.53**
Calcite CaCO3 PTB	**407.9**
Calcite CaCO3 SI	**1.73**
Celestite SrSO4 SI	**-0.10**
Gypsum CaSO4 SI	**-0.80**
Hemihydrate CaSO4 SI	**-0.74**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279925**
Sample ID: **AF03993**
Login Batch: **151109090205**
Collection Date: **11/02/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well St Joseph 1-10**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**167**	mg/L
Dissolved H2S	**18.7**	mg/L
pH	**7.5**	
Pressure	**45**	psi
Temperature	**92**	° F

Analyses	Result	Unit
Bicarbonate	**200**	mg/L
Conductivity	**139489**	µS - cm3
Ionic Strength	**1.60**	
Resistivity	**0.072**	ohms - m
Specific Gravity	**1.063**	
Total Dissolved Solids	**89273.21**	mg/L

Cations	Result	Unit
Iron	**0.2**	mg/L
Manganese	**0.041**	mg/L
Barium	**0.065**	mg/L
Strontium	**31.77**	mg/L
Calcium	**1020**	mg/L
Magnesium	**340.1**	mg/L
Sodium	**32886.03**	mg/L

Anions	Result	Unit
Chloride	**49702**	mg/L
Sulfate	**5093**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.44**
Barite BaSO4 SI	**-0.08**
Calcite CaCO3 SI	**-0.16**
Celestite SrSO4 PTB	**2.4**
Celestite SrSO4 SI	**0.05**
Gypsum CaSO4 SI	**-0.33**
Hemihydrate CaSO4 SI	**-0.34**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279926**
Sample ID: **AF03995**
Login Batch: **151109090205**
Collection Date: **11/02/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well St Joseph 2**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**132**	mg/L
Dissolved H2S	**17**	mg/L
pH	**7.0**	
Pressure	**10**	psi
Temperature	**79**	° F

Analyses	Result	Unit
Bicarbonate	**244**	mg/L
Conductivity	**113414**	µS - cm3
Ionic Strength	**1.30**	
Resistivity	**0.088**	ohms - m
Specific Gravity	**1.049**	
Total Dissolved Solids	**72585.46**	mg/L

Cations	Result	Unit
Iron	**0.47**	mg/L
Manganese	**0.08**	mg/L
Barium	**0.29**	mg/L
Strontium	**70.92**	mg/L
Calcium	**1003**	mg/L
Magnesium	**319.4**	mg/L
Sodium	**26683.30**	mg/L

Anions	Result	Unit
Chloride	**42525**	mg/L
Sulfate	**1739**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.96**
Barite BaSO4 PTB	**0.1**
Barite BaSO4 SI	**0.26**
Calcite CaCO3 SI	**-0.65**
Celestite SrSO4 SI	**-0.01**
Gypsum CaSO4 SI	**-0.74**
Hemihydrate CaSO4 SI	**-0.73**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279927**
Sample ID: **AF03996**
Login Batch: **151109090205**
Collection Date: **11/02/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well St Joseph 3-10**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**132**	mg/L
Dissolved H2S	**43**	mg/L
pH	**7.5**	
Pressure	**10**	psi
Temperature	**76**	° F

Analyses	Result	Unit
Bicarbonate	**351**	mg/L
Conductivity	**127840**	µS - cm3
Ionic Strength	**1.43**	
Resistivity	**0.078**	ohms - m
Specific Gravity	**1.058**	
Total Dissolved Solids	**81817.82**	mg/L

Cations	Result	Unit
Iron	**0.128**	mg/L
Manganese	**0.052**	mg/L
Barium	**0.771**	mg/L
Strontium	**66.51**	mg/L
Calcium	**461.9**	mg/L
Magnesium	**239.9**	mg/L
Sodium	**31096.56**	mg/L

Anions	Result	Unit
Chloride	**48695**	mg/L
Sulfate	**906**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-1.59**
Barite BaSO4 PTB	**0.3**
Barite BaSO4 SI	**0.40**
Calcite CaCO3 SI	**-0.39**
Celestite SrSO4 SI	**-0.34**
Gypsum CaSO4 SI	**-1.36**
Hemihydrate CaSO4 SI	**-1.36**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279924**
Sample ID: **AF03992**
Login Batch: **151109090205**
Collection Date: **11/02/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Zerr 1**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**150**	mg/L
Dissolved H2S	**18.7**	mg/L
pH	**7.5**	
Pressure	**10**	psi
Temperature	**71**	° F

Analyses	Result	Unit
Bicarbonate	**234**	mg/L
Conductivity	**105674**	µS - cm3
Ionic Strength	**1.23**	
Resistivity	**0.095**	ohms - m
Specific Gravity	**1.051**	
Total Dissolved Solids	**67631.47**	mg/L

Cations	Result	Unit
Iron	**0.211**	mg/L
Manganese	**0.073**	mg/L
Barium	**0.232**	mg/L
Strontium	**77.16**	mg/L
Calcium	**1599**	mg/L
Magnesium	**462.5**	mg/L
Sodium	**23904.29**	mg/L

Anions	Result	Unit
Chloride	**40020**	mg/L
Sulfate	**1334**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.93**
Barite BaSO4 PTB	**0.0**
Barite BaSO4 SI	**0.11**
Calcite CaCO3 SI	**-0.03**
Celestite SrSO4 SI	**-0.09**
Gypsum CaSO4 SI	**-0.64**
Hemihydrate CaSO4 SI	**-0.62**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279923**
Sample ID: **AF03991**
Login Batch: **151109090205**
Collection Date: **11/02/2015**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Zerr 2**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**194**	mg/L
Dissolved H2S	**13.6**	mg/L
pH	**8.0**	
Pressure	**70**	psi
Temperature	**73**	° F

Analyses	Result	Unit
Bicarbonate	**312**	mg/L
Conductivity	**133099**	µS - cm3
Ionic Strength	**1.48**	
Resistivity	**0.075**	ohms - m
Specific Gravity	**1.062**	
Total Dissolved Solids	**85184.01**	mg/L

Cations	Result	Unit
Iron	**0.69**	mg/L
Manganese	**0.068**	mg/L
Barium	**1.257**	mg/L
Strontium	**42.92**	mg/L
Calcium	**479.4**	mg/L
Magnesium	**178.9**	mg/L
Sodium	**32524.77**	mg/L

Anions	Result	Unit
Chloride	**50813**	mg/L
Sulfate	**831**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-1.64**
Barite BaSO4 PTB	**0.5**
Barite BaSO4 SI	**0.57**
Calcite CaCO3 PTB	**5.6**
Calcite CaCO3 SI	**0.03**
Celestite SrSO4 SI	**-0.58**
Gypsum CaSO4 SI	**-1.39**
Hemihydrate CaSO4 SI	**-1.39**

Saturation Index Calculation (Tomson-Oddo Model)

Comments:

NALCO Champion
An Ecolab Company

Water Analysis Report

Attention:**Jevon.Benisch@CHAMP-TECH.com**

Customer: **Culbreath Oil & Gas Inc**

Location Code: **279922**
Sample ID: **AF03990**
Login Batch: **151109090205**
Collection Date: **11/02/2915**
Receive Date: **11/09/2015**
Report Date: **11/10/2015**

Region: **Not Available**
Location: **Oakley, KS**
System: **Production System**
Equipment: **Well Zerr 4**
Lab ID: **ABU-0055**
Sample Point: **Wellhead**

Analyses	Result	Unit
Dissolved CO2	**220**	mg/L
Dissolved H2S	**37.4**	mg/L
pH	**7.5**	
Pressure	**75**	psi
Temperature	**78**	° F

Analyses	Result	Unit
Bicarbonate	**224**	mg/L
Conductivity	**122048**	µS - cm3
Ionic Strength	**1.43**	
Resistivity	**0.082**	ohms - m
Specific Gravity	**1.057**	
Total Dissolved Solids	**78111.41**	mg/L

Cations	Result	Unit
Iron	**0.527**	mg/L
Manganese	**0.105**	mg/L
Barium	**0.187**	mg/L
Strontium	**72.5**	mg/L
Calcium	**1988**	mg/L
Magnesium	**517.9**	mg/L
Sodium	**27497.19**	mg/L

Anions	Result	Unit
Chloride	**46257**	mg/L
Sulfate	**1554**	mg/L

Scale Type	Result
Anhydrite CaSO4 SI	**-0.74**
Barite BaSO4 SI	**-0.03**
Calcite CaCO3 PTB	**10.1**
Calcite CaCO3 SI	**0.07**
Celestite SrSO4 SI	**-0.09**
Gypsum CaSO4 SI	**-0.53**
Hemihydrate CaSO4 SI	**-0.52**

Saturation Index Calculation (Tomson-Oddo Model)

Comments: