ROCKY MOUNTAIN AREA LABORATORY
350 COLE CREEK ROAD,
EVANSVILLE, WY 82636

REPORT DATE: 8/12/2020

PARTIAL WATER ANALYSIS REPORT

CUSTOMER:	HILCORP ENERGY CO	**ACCOUNT REP:**	JASON HARE
DISTRICT:	FOUR CORNERS	**SAMPLE ID:**	202012015661
LEASE/AREA:	CALLOWAY	**SAMPLE DATE:**	7/29/2020
SAMPLE POINT NAME:	CALLOWAY # 2	**ANALYSIS DATE:**	8/11/2020
SITE TYPE:	WELL SITES	**ANALYST:**	KS
SAMPLE POINT DESCRIPTION:	WELL HEAD		

HILCORP ENERGY CO, CALLOWAY, CALLOWAY # 2

FIELD DATA

Initial Temperature (°F):	**250**
Final Temperature (°F):	**80**
Initial Pressure (psi):	**100**
Final Pressure (psi):	**15**

pH:

pH at time of sampling:	**10.6**

Scale Residual:	**ChemUsed**	**Resid. PPM**
	Total PO4	0.47

Alkalinity by Titration:	**mg/L**	**meq/L**
Bicarbonate (HCO_3^-):	**305.0**	**5.0**
Carbonate (CO_3^{2-}):	**ND**	
Hydroxide (OH^-):	**ND**	

aqueous CO_2 (ppm):	**ND**
aqueous H_2S (ppm):	**ND**
aqueous O2 (ppb):	**ND**
Calculated TDS (mg/L):	**12155**
Measured Density/Specific Gravity	**ND**
Conductivity (mmhos):	**ND**

ANALYSIS OF SAMPLE

ANIONS:	**mg/L**	**meq/L**
Chloride (Cl^-):	**3713.0**	**104.6**
Sulfate (SO_4^{2-}):	**3594.0**	**74.8**
Borate (H_3BO_3):	**1.9**	**0.0**
Fluoride (F^-):	**ND**	
Bromide (Br^-):	**ND**	
Nitrite (NO_2^-):	**ND**	
Nitrate (NO_3^-):	**ND**	
Phosphate (PO_4^{3-}):	**0.5**	**0.0**
Silica (SiO_2):	**5.7**	**0.1**

Organic Acids:	**mg/L**	**meq/L**
Formic Acid:	**ND**	
Acetic Acid:	**ND**	
Propionic Acid:	**ND**	
Butyric Acid:	**ND**	
Valeric Acid:	**ND**	

Anion/Cation Ratio:	**0.92**

CATIONS:	**mg/L**	**meq/L**
Sodium (Na^+):	**4164.3**	**181.8**
Potassium (K^+):	**14.6**	**0.4**
Magnesium (Mg^{2+}):	**0.3**	**0.0**
Calcium (Ca^{2+}):	**347.2**	**17.3**
Strontium (Sr^{2+}):	**12.0**	**0.3**
Barium (Ba^{2+}):	**0.0**	**0.0**
Iron (Fe^{2+}):	**2.0**	**0.1**
Manganese (Mn^{2+}):	**0.0**	**0.0**
Lead (Pb^{2+}):	**ND**	
Zinc (Zn^{2+}):	**0.1**	**0.0**
Aluminum (Al^{3+}):	**ND**	
Chromium (Cr^{3+}):	**ND**	
Cobalt (Co^{2+}):	**ND**	
Copper (Cu^{2+}):	**ND**	
Molybdenum (Mo^{2+}):	**ND**	
Nickel (Ni^{2+}):	**ND**	
Tin (Sn^{2+}):	**ND**	
Titanium (Ti^{2+}):	**ND**	
Vanadium (V^{2+}):	**ND**	
Zirconium (Zr^{2+}):	**ND**	
Total Hardness:	**883**	

ND = NOT DETERMINED

Comments: Ba<0.0625 ppm