API: 30-045-10593

OCD Received
7/16/2020

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

REPORT DATE: 7/14/2020

PARTIAL WATER ANALYSIS REPORT

CUSTOMER:	HILCORP ENERGY CO	**ACCOUNT REP:**	JASON HARE
DISTRICT:	FOUR CORNERS	**SAMPLE ID:**	202012012564
LEASE/AREA:	CALLOWAY	**SAMPLE DATE:**	6/10/2020
SAMPLE POINT NAME:	CALLOWAY SRC #1	**ANALYSIS DATE:**	7/2/2020
SITE TYPE:	WELL SITES	**ANALYST:**	KS
SAMPLE POINT DESCRIPTION:	WELL HEAD		

HILCORP ENERGY CO, CALLOWAY, CALLOWAY SRC #1

FIELD DATA

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

pH:

pH at time of sampling:	**11.3**

Scale Residual:	**ChemUsed**	**Resid. PPM**
	Total PO4	0.00

Alkalinity by Titration:	**mg/L**	**meq/L**
Bicarbonate (HCO_3^-):	**179.0**	**2.9**
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):	**12831**
Measured Density/Specific Gravity	**ND**
Conductivity (mmhos):	**ND**

ANALYSIS OF SAMPLE

ANIONS:	**mg/L**	**meq/L**
Chloride (Cl^-):	**3123.0**	**88.0**
Sulfate (SO_4^{2-}):	**4816.0**	**100.3**
Borate (H_3BO_3):	**6.8**	**0.1**
Fluoride (F^-):	**ND**	
Bromide (Br^-):	**ND**	
Nitrite (NO_2^-):	**ND**	
Nitrate (NO_3^-):	**ND**	
Phosphate (PO_4^{3-}):	**0.0**	**0.0**
Silica (SiO_2):	**12.5**	**0.2**

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^+):	**4258.8**	**186.0**
Potassium (K^+):	**10.8**	**0.3**
Magnesium (Mg^{2+}):	**0.2**	**0.0**
Calcium (Ca^{2+}):	**424.8**	**21.2**
Strontium (Sr^{2+}):	**11.4**	**0.3**
Barium (Ba^{2+}):	**0.0**	**0.0**
Iron (Fe^{2+}):	**0.3**	**0.0**
Manganese (Mn^{2+}):	**0.0**	**0.0**
Lead (Pb^{2+}):	**ND**	
Zinc (Zn^{2+}):	**0.0**	**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:	**1076**

ND = NOT DETERMINED

Comments: Ba<0.0625 P<0.025 ppm