



Oilfield Labs of America
 3302 Pilot Ave.
 Midland, Texas 79706
 432-789-1860

Report Date: 2/6/2019

Complete Water Analysis

Customer:	True Clear Water Solutions	Account Rep:	John Ayres
Operator:	Crown Quest	Sample ID:	01190131411
Lease:	Raw	Sample Date:	1/31/2019
Sample Point:	200	Received Date:	1/31/2019
Region:	Permian	Log Out Date:	2/6/2019

True Clear Water Solutions, Crown Quest, Raw,200

Field Data		Analysis of Sample											
		Anions:		mg/L		meq/L		Cations:		mg/L		meq/L	
Initial Temperature (°F):	190	Chloride (Cl ⁻):	73300	2067.7	Sodium (Na ⁺):	33430	1454.8						
Final Temperature (°F):	80	Sulfate (SO ₄ ²⁻):	30.0	0.6	Potassium (K ⁺):	400	10.2						
Initial Pressure (psi):	1250	Bicarbonate (HCO ₃ ⁻):	449	7.4	Magnesium (Mg ²⁺):	502	41.3						
Final Pressure (psi):	15	Carbonate (CO ₃ ²⁻):	ND		Calcium (Ca ²⁺):	2891	144.3						
Dissolved Gases		Hydroxide (OH ⁻):	ND		Strontium (Sr ²⁺):	620	14.1						
Dissolved CO ₂ (ppm):	243	Phosphate (PO ₄ ³⁻):	15.6	0.5	Barium (Ba ²⁺):	3.7	0.1						
Dissolved H ₂ S (ppm):	1.5	Borate (H ₃ BO ₃):	232	3.7	Iron (Fe, Total):	1083	38.8						
Sample Parameters		Silica (SiO ₂):	39.7	0.7	Manganese (Mn ²⁺):	1.8	0.1						
pH:	7.0				Lead (Pb ²⁺):	0.1	0.0						
Calculated TDS (mg/L):	113159				Zinc (Zn ²⁺):	2.7	0.1						
Calculated Density (g/cm ³):	1.0702				Lithium (Li ⁺):	18.2	2.6						
Total Hardness (mg/L CaCO ₃):	9999				Aluminum (Al ³⁺):	2.8	0.3						
Total Alkalinity (mg/L CaCO ₃):	368												
		Anion EPM Total:	2081		Cation EPM Total:	1707							
N/A - Not Analyzed		% RPD of Cations/Anions:		19.7%		ND = Not Detected							

Conditions		Barite (BaSO ₄)		Calcite (CaCO ₃)		Gypsum (CaSO ₄ ·2H ₂ O)		Anhydrite (CaSO ₄)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	-0.38	0.000	1.34	68.930	-2.01	0.000	-2.32	0.000
92°F	152 psi	-0.48	0.000	1.37	70.659	-2.02	0.000	-2.24	0.000
104°F	289 psi	-0.58	0.000	1.40	72.498	-2.02	0.000	-2.16	0.000
117°F	427 psi	-0.66	0.000	1.42	74.422	-2.02	0.000	-2.09	0.000
129°F	564 psi	-0.74	0.000	1.46	76.445	-2.02	0.000	-2.01	0.000
141°F	701 psi	-0.81	0.000	1.49	78.568	-2.01	0.000	-1.95	0.000
153°F	838 psi	-0.87	0.000	1.53	80.787	-2.01	0.000	-1.88	0.000
166°F	976 psi	-0.92	0.000	1.56	83.088	-2.01	0.000	-1.81	0.000
178°F	1113 psi	-0.96	0.000	1.61	85.455	-2.02	0.000	-1.75	0.000
190°F	1250 psi	-1.00	0.000	1.65	87.869	-2.02	0.000	-1.69	0.000

Conditions		Celestite (SrSO ₄)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate (FeCO ₃)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	-0.92	0.000	-1.41	0.000	3.73	1.397	2.58	126.991
92°F	152 psi	-0.95	0.000	-1.42	0.000	3.64	1.396	2.64	128.591
104°F	289 psi	-0.97	0.000	-1.43	0.000	3.57	1.396	2.70	130.055
117°F	427 psi	-0.98	0.000	-1.44	0.000	3.50	1.396	2.75	131.361
129°F	564 psi	-0.99	0.000	-1.45	0.000	3.44	1.396	2.80	132.529
141°F	701 psi	-1.00	0.000	-1.45	0.000	3.39	1.396	2.85	133.579
153°F	838 psi	-1.01	0.000	-1.46	0.000	3.36	1.396	2.89	134.524
166°F	976 psi	-1.01	0.000	-1.46	0.000	3.33	1.396	2.93	135.378
178°F	1113 psi	-1.01	0.000	-1.46	0.000	3.30	1.396	2.96	136.150
190°F	1250 psi	-1.01	0.000	-1.47	0.000	3.29	1.396	2.99	136.848

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered
 Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.
 Note 3: Saturation Index predictions on this sheet use pH and alkalinity; %CO₂ is not included in the calculations.

Comments: _____

