

Analytical Laboratory Report for:

Conoco

UNICHEM

A Division of BJ Services Company

UNICHEM Representative: Tony Snow

Production Water Analysis

Listed below please find water analysis report from: Jicarilla, #30-1 SWD

Lab Test No:	2001114927	Sample Date:	04/18/2001
Specific Gravity:	1.009		
TDS:	11646		
pH:	7.07		

Cations:	mg/L	as:
Calcium	79	(Ca ⁺⁺)
Magnesium	14	
(Mg ⁺⁺)		
Sodium	4050	
(Na ⁺)		
Iron	7.73	(Fe ⁺⁺)
Barium	0.06	(Ba ⁺⁺)
Strontium	9.83	(Sr ⁺⁺)
Manganese	0.22	(Mn ⁺⁺)

Anions:

mg/L

as:

Bicarbonate	885
(HCO ₃ ⁻)	
Sulfate	800
(SO ₄ ⁼)	
Chloride	5800
(Cl ⁻)	

Gases:

Carbon Dioxide	119
(CO ₂)	
Hydrogen Sulfide	1 (H ₂ S)

Comments:

DownHole SAT(tm)
DEPOSITION POTENTIAL INDICATORS

Conoco
Jicarilla

#30-1 SWD

Report Date: 05-13-2001 Sampled: 04-18-2001
Sample #: 4927 at 0030

SATURATION LEVEL		MOMENTARY EXCESS (Lbs/1000 Barrels)	
Calcite (CaCO3)	0.965	Calcite (CaCO3)	-0.0276
Aragonite (CaCO3)	0.818	Aragonite (CaCO3)	-0.171
Witherite (BaCO3)	< 0.001	Witherite (BaCO3)	-11.34
Strontianite (SrCO3)	0.333	Strontianite (SrCO3)	-1.57
Magnesite (MgCO3)	0.171	Magnesite (MgCO3)	-2.58
Anhydrite (CaSO4)	0.0567	Anhydrite (CaSO4)	-473.89
Gypsum (CaSO4*2H2O)	0.0688	Gypsum (CaSO4*2H2O)	-463.94
Barite (BaSO4)	1.01	Barite (BaSO4)	< 0.001
Celestite (SrSO4)	0.162	Celestite (SrSO4)	-34.21
Fluorite (CaF2)	0.00	Fluorite (CaF2)	-22.42
Calcium phosphate	0.00	Calcium phosphate	>-0.001
Hydroxyapatite	0.00	Hydroxyapatite	-294.34
Silica (SiO2)	0.00	Silica (SiO2)	-56.26
Brucite (Mg(OH)2)	< 0.001	Brucite (Mg(OH)2)	-2.65
Magnesium silicate	0.00	Magnesium silicate	-104.83
Iron hydroxide (Fe(OH)3)	< 0.001	Iron hydroxide (Fe(OH)3)	< 0.001
Strengite (FePO4*2H2O)	0.00	Strengite (FePO4*2H2O)	>-0.001
Siderite (FeCO3)	212.90	Siderite (FeCO3)	0.899
Halite (NaCl)	< 0.001	Halite (NaCl)	-175959
Thenardite (Na2SO4)	< 0.001	Thenardite (Na2SO4)	-51109
Iron sulfide (FeS)	19.08	Iron sulfide (FeS)	0.955

SIMPLE INDICES		BOUND IONS	TOTAL	FREE
Langelier	0.120	Calcium	79.00	62.36
Ryznar	6.83	Barium	0.0600	0.0600
Puckorius	4.73	Carbonate	4.53	1.34
Larson-Skold Index	12.56	Phosphate	0.00	0.00
Stiff Davis Index	0.0226	Sulfate	800.00	696.82
Odde-Tomson	-0.133			

UNICHEM - Midland Analytical Laboratory
P.O. Box 61427, Midland, Texas 79711

DownHole SAT(tm)
WATER CHEMISTRY

Conoco #30-1 SWD
Jicarilla

Report Date: 05-13-2001 Sampled: 04-18-2001
Sample #: 4927 at 0000

CATIONS

Calcium (as Ca)	79.00
Magnesium (as Mg)	14.00
Barium (as Ba)	0.0600
Strontium (as Sr)	9.83
Sodium (as Na)	4050
Potassium (as K)	0.00
Lithium (as Li)	0.00
Ammonia (as NH3)	0.00
Aluminum (as Al)	0.00
Iron (as Fe)	7.73
Boron (as B)	0.00
Manganese (as Mn)	0.220
Zinc (as Zn)	0.00
Lead (as Pb)	0.00

ANIONS

Chloride (as Cl)	5800
Sulfate (as SO4)	800.00
Bromine (as Br)	0.00
Dissolved CO2 (as CO2)	119.00
Bicarbonate (as HCO3)	885.00
Carbonate (as CO3)	0.00
Silica (as SiO2)	0.00
H2S (as H2S)	1.48
Phosphate (as PO4)	0.00
Nitrate (as NO3)	0.00
Fluoride (as F)	0.00

PARAMETERS

pH	7.07
Temperature (°F)	100.00
Density(mg/L)	1.01
Pressure(atm)	14.70
Calculated T.D.S.	12046
Molar Conductivity	17182

COMMENTS

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