

Chemical Consultants

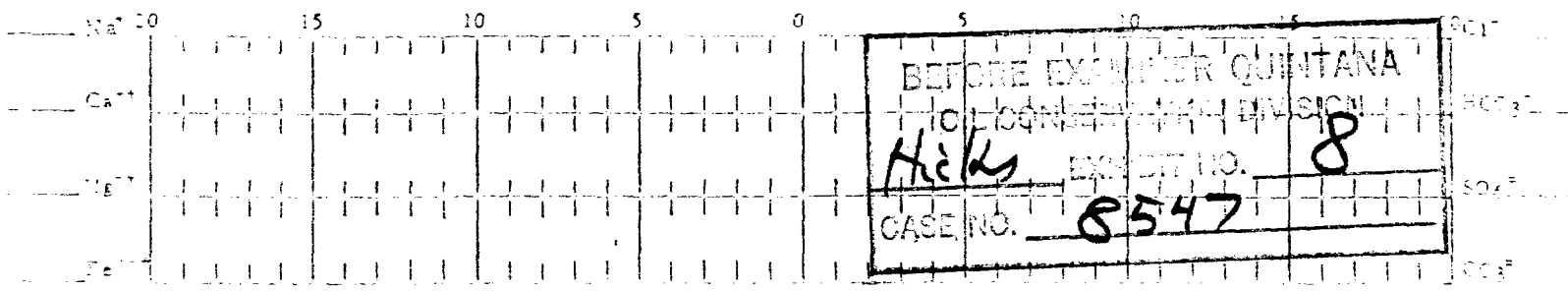
WATER ANALYSIS TEST REPORT

ANALYST: [illegible]
DATE: 12-2-82
FIELD NO.: 8547

COUNTY		SHEET NUMBER	
HICKS		DATE	
FIELD		STATE	
LEASE OF UNIT		WELL(S) NAME OF NO.	
SB Cha Cha		36	
WATER SOURCE (PLANTATION)		Well 36	

DEPTH, FT.	DATE, F	WATER TEMPERATURE	DEPTH, F	WATER, GAL DAY	COLLECTED DAY	DATE, MONTH YEAR
WELL NO.	APPROXIMATE	WELL DEPTH	WELL TYPE	WELL TYPE	WELL TYPE	WELL TYPE

NATURAL MINERAL WATER PATTERNS
(CLASSIFICATION ON BASIS OF UNITED STATES CODE)



DISSOLVED SOLIDS

CATIONS	mg/l*	ppm*
Total Hardness	135	276
Sodium, Na ⁺ (calc.)	43	86
Calcium, Ca ⁺⁺	53.3	106.6
Magnesium, Mg ⁺⁺	.12	1.5
Iron (Total), Fe ⁺⁺⁺	.15	2.7
ANIONS		
Chloride, Cl ⁻	33.8	1000
Sulfate, SO ₄ ²⁻	2.0	95
Carbonate, CO ₃ ²⁻	2.3	70
Bicarbonate, HCO ₃ ⁻	15.9	371
Hydroxyl, OH ⁻	0	0
Silicate, Si ⁴⁻		
Fluoride, F ⁻		
Phosphate, PO ₄ ³⁻		

DISSOLVED GASES

Methane, CH ₄	mg/l*
Carbon Dioxide, CO ₂	mg/l*
Oxygen, O ₂	mg/l*

INTERNAL CHARACTERISTICS

pH	8.12
EH (Redox Potential)	MV
Specific Gravity	
Temperature, °F	
Total Dissolved Solids (Calc.)	357.5 mg/l*
Stability Index	6 F
Corrosion Index	3 F
Max. Fe (ppm) (Calc.)	mg/l*
Max. Mn (ppm) (Calc.)	mg/l*
Max. Zn (ppm) (Calc.)	mg/l*
Corrosion Index	ppm (Vol %)

DISSOLVED SOLIDS (QUALITATIVE)

Non-Sulfate [] Non-Oxide [] Calcium Chloride [] Acid Insoluble [] * Other []

REMARKS AND RECOMMENDATIONS:

ILLEGIBLE

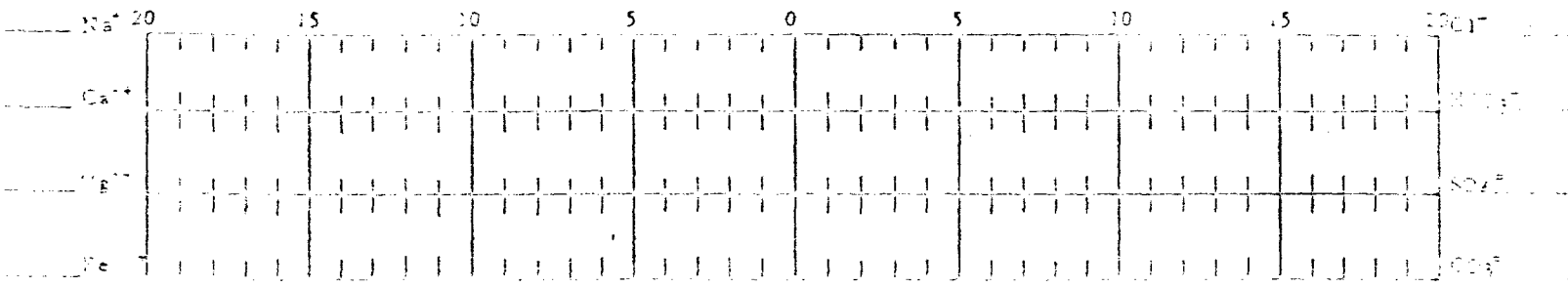
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WATER ANALYSIS TEST REPORT

P.O. Box 1421
San Juan, New Mexico 87901

COMPANY HICKS				DATE 12-13-82			
FIELD Cha Cha Gallup				COUNTY OF PUEBLO San Juan			
WELL(S) NAME & NO. S.E. Cha Cha 37				WATER SOURCE (DECONTAM) Well Head			
DEPTH, FT.		CST, F		TEMP, F		GAL, L PER DAY	
WATER TYPE		WATER TYPE		WATER TYPE		WATER TYPE	

WATER ANALYSIS METHOD
WATER ANALYSIS METHOD INDICATES HARD SCALE UNITS



DISSOLVED SOLIDS

ION	mg/l*	mg/l*
Total Dissolved Solids	9.0	4.0
Sulfate, SO ₄ ²⁻ (Calc.)	1.0	3.9
Calcium, Ca ⁺⁺	1.2	8.4
Magnesium, Mg ⁺⁺	4.8	58.3
Iron (Total), Fe ⁺⁺⁺	0.03	.5

ANIONS

Chloride, Cl ⁻	164.	5,800.
Sulfate, SO ₄ ²⁻	2.5	120.
Carbonate, CO ₃ ²⁻	0	0
Bicarbonate, HCO ₃ ⁻	12.4	75.6.
Hydroxyl, OH ⁻	0	0
Sulfide, S ²⁻		
Phosphate-Mono, PO ₄ ³⁻		
Phosphate-Di, PO ₄ ²⁻		

DISSOLVED GASES

Dissolved Oxygen, O ₂	mg/l*
Calcium Hydroxide, Ca(OH) ₂	mg/l*
Calcium, Ca	mg/l*

PHYSICAL PROPERTIES

pH	7.76
EH (Redox Potential)	mV
Specific Gravity	
Turbidity, JTU Units	
Total Dissolved Solids (Calc.)	10,279.3 mg/l*
Stability Index	F
Calcium Chloride, CaCl ₂	F
Calcium Hydroxide, Ca(OH) ₂	F
Max. Ca(OH) ₂ (Calc.)	mg/l*
Max. CaCO ₃ (Calc.)	mg/l*
Round of H ₂ O	ppm (Vol)/%

SUSPENDED SOLIDS (QUALITATIVE)

Iron Sulfide ☐ Iron Oxide ☐ Calcium Carbonate ☐ Acid Insoluble ☐

REMARKS AND RECOMMENDATIONS:

Water is hard and slightly acidic. Hardness is due to calcium and magnesium. Water is not suitable for drinking. Water is not suitable for irrigation. Water is not suitable for industrial use. Water is not suitable for domestic use. Water is not suitable for agricultural use. Water is not suitable for medical use. Water is not suitable for scientific use. Water is not suitable for research use. Water is not suitable for development use. Water is not suitable for conservation use. Water is not suitable for protection use. Water is not suitable for management use. Water is not suitable for planning use. Water is not suitable for policy use. Water is not suitable for strategy use. Water is not suitable for tactics use. Water is not suitable for operations use. Water is not suitable for logistics use. Water is not suitable for intelligence use. Water is not suitable for information use. Water is not suitable for communication use. Water is not suitable for coordination use. Water is not suitable for cooperation use. Water is not suitable for collaboration use. Water is not suitable for partnership use. Water is not suitable for alliance use. Water is not suitable for coalition use. Water is not suitable for confederation use. Water is not suitable for federation use. Water is not suitable for union use. Water is not suitable for association use. Water is not suitable for organization use. Water is not suitable for institution use. Water is not suitable for corporation use. Water is not suitable for company use. Water is not suitable for firm use. Water is not suitable for business use. Water is not suitable for enterprise use. Water is not suitable for industry use. Water is not suitable for sector use. Water is not suitable for market use. Water is not suitable for industry use. Water is not suitable for sector use. Water is not suitable for market use.

ANALYST	DATE	TIME	LOCATION

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At Types Of Field Chemical Analysis

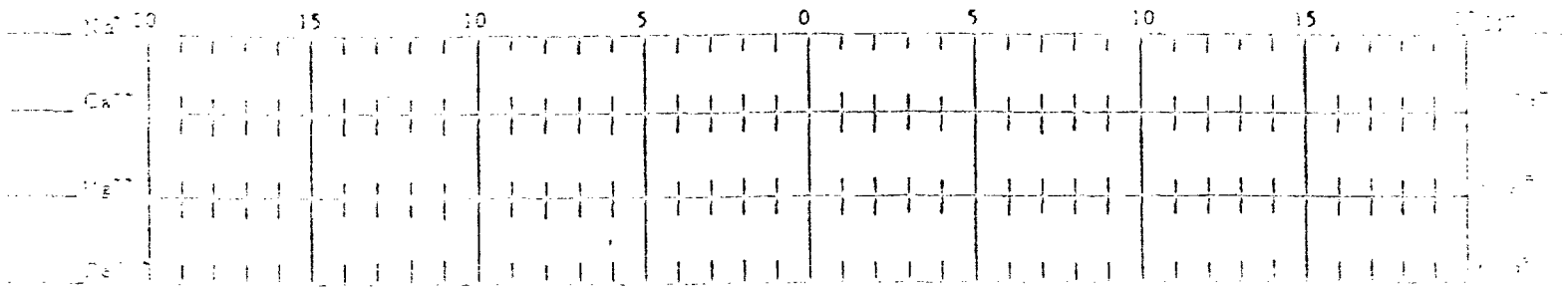
P.O. Box 421

Farmington, New Mexico 87401

WATER ANALYSIS TEST REPORT

COMPANY Hicks				DATE 12-13-82	
FIELD Cha Cha Gallup				COUNTY OR PARISH San Juan	
STATE OF NM S.F. Cha Cha		WELL(S) NAME OR NO. 39		WATER SOURCE (FORMATION) 	
DEPTH, FT.	DAY, F	WATER SOURCE	TEMP, F	WATER, SPL/DAY	GIL, SPL/DAY
WATER ANALYSIS		TYPE OF WATER ☒ REDUCED WATER ☐ INJECTION WATER ☐ OTHER			

WATER ANALYSIS PATTERN (NUMBER SPECIMEN ON SYMBOLS IN CASES WHERE SCALE IS 10)



UNIONIZED IONS

Calcium, Ca ⁺⁺	14.1*	14.1*
Magnesium, Mg ⁺⁺	9.2	9.2
Sulfate, SO ₄ ²⁻ (Calc.)	175.2	175.2
Sulfate, SO ₄ ²⁻	6.2	184.
Hydroxyl, OH ⁻	3.0	26.5
Iron (Total), Fe ⁺⁺⁺	.05	1.0
Chloride, Cl ⁻	169.0	6770.
Sulfate, SO ₄ ²⁻	1.1	55
Carbonate, CO ₃ ²⁻	3.6	103.
Bicarbonate, HCO ₃ ⁻	10.6	647.
Hydroxyl, OH ⁻	0	0
Sulfate, SO ₄ ²⁻		
Hydroxyl, OH ⁻		
Hydroxyl, OH ⁻		
Hydroxyl, OH ⁻		

DISSOLVED IONS

Hydroxyl, OH ⁻	
Carbonate, CO ₃ ²⁻	
Oxygen, O ₂	

PHYSICAL PROPERTIES

pH	8.3
Eh (Redox Potential)	
Specific Gravity	
Turbidity, JTU Units	
Total Dissolved Solids (Calc.)	10,996.3 mg/l
Stability Index	8 F
CaCO ₃ Solubility	8 F
CaCO ₃ Solubility	8 F
Max. CaCO ₃ Possible (Calc.)	
Max. CaCO ₃ Possible (Calc.)	
Residual Hydroxyls	

UNIONIZED SOLIDS (QUALITATIVE)

Iron Sulfide ☐ Iron Oxide ☐ Calcium Carbonate ☐ Acid Insoluble ☐

COMMENTS AND RECOMMENDATIONS:

Only one sample was analyzed. The results are based on the assumption that the sample is representative of the water body. The results are for information only.

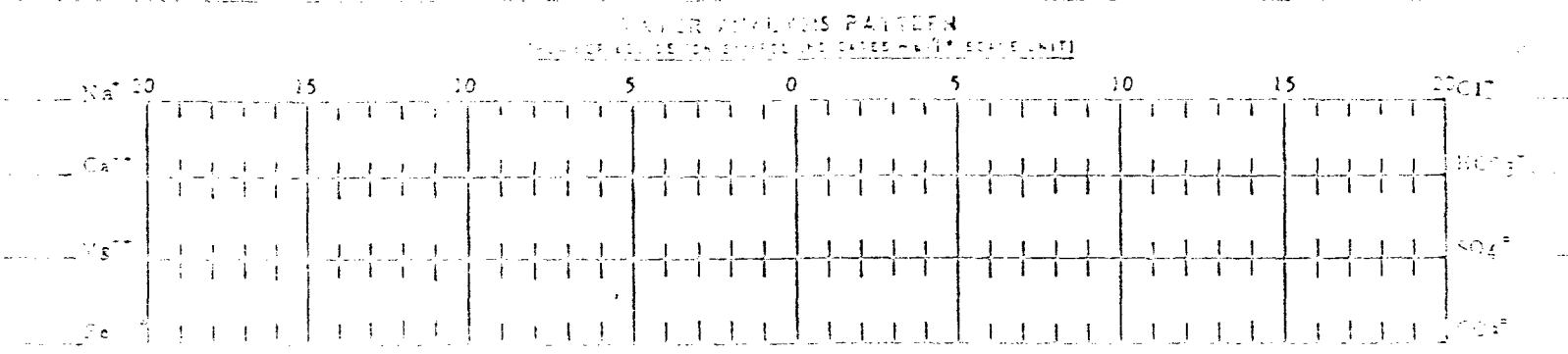
ANALYST James H. Thompson, N.M.	DATE 12-13-82	LOCATION San Juan Co., N.M.
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Chemical Consultants

WATER ANALYSIS TEST REPORT

Form No. 1, NEW MEXICO 87401

SHEET NUMBER			
COMPANY Ricks Oil & Gas			DATE 11-22-82
WELL(S) NAME OR NO. S.E. Cha Cha #40		COUNTY OR PARISH	
WATER SOURCE (DEFORMATION)		STATE	
DEPTH, FT.	DATE, F	WELL DEPTH	TEMP, F
WATER, INL DAY	OIL, INL DAY	GAS, INL DAY	
WATER ANALYSIS PATTERN			
[] PREPARED WATER [] INJECTION WATER [] OTHER			



ANIONIC ANALYSIS

ANIONS	mg/l*	mg/l*
Chloride, Cl ⁻	107.2	3.500
Sulfate, SO ₄ ⁼	73	35
Carbonate, CO ₃ ⁼		
Bicarbonate, HCO ₃ ⁼		
Hydroxyl, OH ⁼		
Sulfide, S ⁼		
Phosphate-Mo, PO ₄ ⁼		
Phosphate-Oro, PO ₄ ⁼		

DISSOLVED GASES

H ₂ Sulfide, H ₂ S	mg/l*
Oxygen Dis-Mo, O ₂	mg/l*
Oxygen, O ₂	mg/l*

PHYSICAL PROPERTIES

pH	8.0
OR (Drexel Det. Unit)	IV
Specific Gravity	
Turbidity, JTU Units	
Total Dissolved Solids (Calc.)	6,200 mg/l*
Stability Index	0 F
CaSO ₄ Solubility	0 F
Max. CaSO ₄ Possible (Calc.)	mg/l*
Max. BaSO ₄ Possible (Calc.)	mg/l*
Residual Hydrocarbons	ppm (Vol %)

OUTCROP SOLIDS (ANALYTICAL)

Non Soluble [] Non Oxide [] Calcium Carbonate [] Acid Insoluble []

REMARKS AND RECOMMENDATIONS:

* NOTE: mg/l and mg/l are commonly used interchangeably for ppm and ppm respectively. There are 1000 mg/l in 1 ppm. Thus should be used for ppm only.

ANALYST: [] DATE: [] REVIEWER: [] APPROVED: []

UNICHEM INTERNATIONAL

601 NORTH LEECH

P.O. BOX 1499

HOUSTON, NEW MEXICO 88240

PROPERTY & ENERGY RESERVES GROUP

DATE : 5-22-84

FIELD, LARSEN & WELLS : E.H. PIPKIN Well #23 PICTURE CLIFF FIELD

SAMPLING POINT: WELLHEAD

DATE SAMPLED : 5-15-84

SPECIFIC GRAVITY = 1.018

TOTAL DISSOLVED SOLIDS = 28012

PH = 7.47

ME/L

MG/L

CATIONS

CALCIUM	(CA)+2	3.5	76.1
MAGNESIUM	(MG)+2	11	133.
SODIUM	(NA)+CALC.	457.	10810.

ANIONS

BICARBONATE	(HCO3)-1	21	1331.
CARBONATE	(CO3)-2	0	0
THIOXIDE	(CH)-1	0	0
SULFATE	(SO4)-2	0	0
CHLORIDE	(CL)-1	451	16000

DISSOLVED GASES

CARBON DIOXIDE	(CO2)	NOT RUN
HYDROGEN SULFIDE	(H2S)	NOT RUN
OXYGEN	(O2)	NOT RUN

IRON (TOTAL)	(FE)		5.6
CHLORINE	(CL)+2	.15	10.3
NITROGEN	(NR)	NOT RUN	

TENSILE STRENGTH (MORAL) = .47

SCALING INDEX

TEMP

	30C	100
	86F	190F
CALCIUM INDEX	0.0	1.13
CALCIUM CARBONATE SCALING	HEAVY	HEAVY
CALCIUM SULFATE INDEX	10.	27.
CALCIUM SULFATE SCALING	HEAVY	HEAVY

Detected Cliffs

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801 NORTH LEECH

P.O. BOX 1499

MOORE, NEW MEXICO 88240

COMPANY : ENERGY RESERVES GROUP
DATE : 12-15-83
FIELD LABS/ANALYST : G. C. H. 1818
SAMPLING POINT: WELLHEAD
DATE SAMPLED : 12-7-83

SPECIFIC GRAVITY = 1.135
TOTAL DISSOLVED SOLIDS = 51258
PH = 6.08

		MG/L	MG/L
CATIONS			
CALCIUM	(CA) ²⁺	50	1403.
MAGNESIUM	(MG) ²⁺	120	1918.
SODIUM	(NA) ⁺ , C/LC.	714.	16433
ANIONS			
BICARBONATE	(HCO ₃) ⁻¹	12.4	756.
CARBONATE	(CO ₃) ⁻²	0	0
HYDROXIDE	(OH) ⁻¹	0	0
SULFATE	(SO ₄) ⁻²	0	0
CHLORIDES	(CL) ⁻¹	902	31190
DISSOLVED GASES			
CARBON DIOXIDE	(CO ₂)	NOT RUN	
HYDROGEN SULFIDE	(H ₂ S)	NOT RUN	
NITROGEN	(N ₂)	NOT RUN	
IRON (TOTAL)	(FE)		109.
ZINC	(ZN) ²⁺	.82	76
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) = 1.032

	TEMP	
	30C	48.8C
	86F	120F
	1293	1694
CARBONATE INDEX		
CALCIUM CARBONATE SCALING	Likely	Likely
SODIUM SULFATE INDEX	-54.	-54.
CALCIUM SULFATE SCALING	Unlikely	Unlikely
MAGNESIUM SULFATE INDEX	-2.1	-3.3
SODIUM SULFATE SCALING	Unlikely	Unlikely

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201 NORTH LEECH

P.O. BOX 1499

MORRIS, NEW MEXICO 88249

COMPANY - ENERGY RESOURCES GROUP
 ANALYST - J. J. WILSON
 FIELD NUMBER - 0015
 ANALYSIS POINT - WHEELWRIGHT
 DATE SAMPLED - 12-7-88

SPECIFIC GRAVITY = 1.04
 TOTAL DISSOLVED SOLIDS = 19903
 pH = 6.61

		ME/L	MG/L
CATIONS			
SODIUM	(NA)+2	80	1600
POTASSIUM	(K)+2	90	1800
CALCIUM	(CA)+2	684	13680
ANIONS			
BICARBONATE	(HCO3)-1	4.8	96
CHLORIDE	(CL)-1	0	0
SULFATE	(SO4)-2	0	0
NITRATE	(NO3)-1	0	0
PHOSPHATE	(PO4)-3	0	0
AMMONIUM	(NH4)+2	1000	20000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		32.0
ARSENIC	(AS)+2	1.7	171
MANGANESE	(MN)	NOT RUN	

ONIC STRENGTH (MOLAL) = 1.159

SCALING INDEX	TEMP
	31C 48.8C
	81F 120F
	140 0.0
ARSENATE INDEX	UNLIFELY
ALUMINUM CARBONATE SCALING	UNLIFELY
ALUMINUM SULFATE INDEX	57 -57
ALUMINUM SULFATE SCALING	UNLIFELY
ARSENIC SULFATE INDEX	-1.1 -1.7
ARSENIC SULFATE SCALING	UNLIFELY

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401 NORTH LEECH

P.O. BOX 1699

HOESS, NEW MEXICO 88240

COMPANY : ENERGY RESERVES GROUP
DATE : 12-12-83
WELL/LEASE/DEWELL : G.C.U. 0013
SAMPLING POINT : WELLHEAD
DATE SAMPLED : 12-7-83

SPECIFIC GRAVITY = 1.085
TOTAL DISSOLVED SOLIDS = 53185
N = 6.93

		ME/L	MO/L
CATIONS			
ALUMINUM	(CA)+2	44.6	895.
MAGNESIUM	(MG)+2	48.3	967.
SODIUM	(NA)+1, CALC.	620.	12400.
ANIONS			
BICARBONATE	(HCO3)-1	11.8	719.
ACETATE	(CO3)-2	0	0
FLUORIDE	(CH)-1	0	0
CHLORIDE	(SO4)-2	0	0
NITRATES	(CL)-1	902	31000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		57.4
MANGANESE	(EA)+2	115	108.
	(MN)	NOT RUN	

ONIC STRENGTH (MOLAL) = 999

SCALING INDEX	TEMP	
	80C	48.80
	88F	110F
	107F	147F
MAGNESIUM INDEX		
MAGNESIUM CARBONATE SCALING	LIKELY	LIKELY
MAGNESIUM SULFATE INDEX		
MAGNESIUM SULFATE SCALING	UNLIKELY	UNLIKELY
MANGANESE SULFATE INDEX		
MANGANESE SULFATE SCALING	UNLIKELY	UNLIKELY

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601 NORTH LEECH

P.O. BOX 1699

HEERES, NEW MEXICO 88240

COMPANY ENERGY RESERVES GROUP
 DATE 11-12-80
 FIELD PASSIONEL C. C. U. #311
 PUMPING POINT VELLHEAD
 DATE SAMPLED 12-7-80

SPECIFIC GRAVITY = 1.085
 TOTAL DISSOLVED SOLIDS = 33433
 PH = 7.67

		MG/L	MG/L
CATIONS			
CALCIUM	(CA)+2	387	781
MAGNESIUM	(MG)+2	56	807
SODIUM	(NA)+1	827	15016
ANIONS			
BICARBONATE	(HCO3)-1	13.8	829
CARBONATE	(CO3)-2	0	0
HYDROXYDE	(OH)-1	0	0
SULFATE	(SO4)-2	0	0
CHLORIDE	(CL)-1	702	32000
DISSOLVED GASES			
CAFFEON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
CYANIDE	(CN)	NOT RUN	
IRON(TOTAL)	(FE)		13
BARIUM	(BA)+2	1.5	108
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) = 1.995

SCALING INDEX	TEMP	
	35C	38.5C
	36F	100F
	611	1.01
CARBONATE INDEX	LIKELY	LIKELY
CALCIUM CARBONATE SCALING		
CALCIUM SULFATE INDEX	-46.	-47.
CALCIUM SULFATE SCALING	UNLIKELY	UNLIKELY
MAGNESIUM SULFATE INDEX	-1.1	-1.7
MAGNESIUM SULFATE SCALING	UNLIKELY	UNLIKELY

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601 NORTH BEECH

P.O. BOX 1499

MOBES, NEW MEXICO 88243

COMPANY : ENERGY RESOURCES GROUP
DATE : 12-17-83
FIELD : LEASEWELL : C O U. 4308
SAMPLING POINT : ASPHERATOR
DATE SAMPLED : 12-7-83

SPECIFIC GRAVITY = 1.032
TOTAL DISSOLVED SOLIDS = 38101
PH = 7.10

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	38	761
MAGNESIUM	(MG)+2	37	749
SODIUM	(NA)+1C	751	15020
ANIONS			
BICARBONATE	(HCO3)-1	8.2	500
CARBONATE	(CO3)-2	0	0
HYDROSULPH	(SH)-1	0	0
SULFATE	(SO4)-2	0	0
CHLORIDE	(CL)-1	818	25000
DISSOLVED GASES			
DILUTED DI-OXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON (TOTAL)	(FE)		3.6
BARIUM	(BA)+2	1.7	122
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MG/L) = 1895

	SCALING INDEX	TEMP	
		50C	45.5C
CALCULATE INDEX		82F	105F
		1.194	1.094
CALCIUM CARBONATE SCALING		LIKELY	LIKELY
MAGNESIUM SULFATE INDEX		1.63	1.64
		UNLIKELY	UNLIKELY
SODIUM SULFATE INDEX		1.91	1.86
		UNLIKELY	UNLIKELY

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201 NORTH LEECH

P.O. BOX 1099

MOERS, NEW MEXICO 88260

COMPANY: ENERGY RESERVES GROUP
DATE: 10-10-83
FIELD: DE WAVE/EL G C M 4284
SAMPLING POINT: 00110012
DATE SAMPLED: 10-7-83

SPECIFIC GRAVITY = 1.043
TOTAL DISSOLVED SOLIDS = 73270
TM = 3.18

		MG/L	MG/L
CATIONS			
CALCIUM	(CA)+2	36.4	786.
MAGNESIUM	(MG)+2	45.3	581.
SEDIUM	(NA)+1	1029.	73670
ANIONS			
BICARBONATE	(HCO3)-1	11.6	707.
CARBONATE	(CO3)-2	0	0
HYPOCHLORITE	(OCl)-1	0	0
SULFATE	(SO4)-2	0	0
CHLORIDE	(Cl)-1	1100	38000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON (TOTAL)	(FE)		10.3
BARIUM	(BA)+2	1.3	106
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MCIAP) = 1.191

SCALING INDEX		TEMP	
		30C	45.8C
		50C	120F
		30F	175F
CARBONATE INDEX		LIKELY	LIKELY
CALCIUM CARBONATE SCALING			
CALCIUM SULFATE INDEX		-72.	-75.
CALCIUM SULFATE SCALING		UNLIKELY	UNLIKELY
BARIUM SULFATE INDEX		-4.3	-2.0
BARIUM SULFATE SCALING		UNLIKELY	UNLIKELY

UNICHEM INTERNATIONAL

301 NORTH LEECH

P.O. BOX 1099

ROSEB, NEW MEXICO 88210

COMPANY - ENERGY RESOURCES GROUP
DATE - 12-12-83
FIELD - LEASEWELL - C. O. U. #300
WELL - POINT - SEPARATOR
DATE SAMPLED - 12-7-83

SPECIFIC GRAVITY = 1.032
TOTAL DISSOLVED SOLIDS = 38109
PH = 7.11

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	33.3	336
MAGNESIUM	(MG)+2	51.6	528
SODIUM	(NA)+CALC.	742.	17000
ANIONS			
BICARBONATE	(HCO3)-1	9.3	397
CARBONATE	(CO3)-2	0	0
SULFONATE	(SO4)-2	0	0
SULFATE	(SO4)-2	0	0
CHLORIDE	(CL)-1	318	13000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		13.1
BARIUM	(BA)+2	2.0	100.
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) = .907

SCALING INDEX	TEMP
	300 13.10
	350 12.15
	373 10.71
CARBONATE INDEX	LIKELY
CALCIUM CARBONATE SCALING	LIKELY
CALCIUM SULFATE INDEX	UNLIKELY
CALCIUM SULFATE SCALING	UNLIKELY
BARIUM SULFATE INDEX	UNLIKELY
BARIUM SULFATE SCALING	UNLIKELY

UNITED INTERNATIONAL

401 NORTH LEECH

P.O. BOX 1459

MOORE, NEW MEXICO 88200

COMPANY : ENERGY RESERVES
DATE : 11-12-83
FIELD NO. : 10000
WELL NO. : 10000
WELL TYPE : OIL
DATE SAMPLED : 12-7-83

SPECIFIC GRAVITY = 1.005
TOTAL DISSOLVED SOLIDS = 25000
PH = 7.00

		MG/L	MG/L
CATIONS			
CALCIUM	(CA)+2	41.3	818
MAGNESIUM	(MG)+2	36.6	141
SODIUM	(NA)+1	237.1	19151
ANIONS			
BICARBONATE	(HCO3)-1	13.4	517.1
CARBONATE	(CO3)-2	0	0
HYDROGEN SULFIDE	(HS)-1	0	0
SULFATE	(SO4)-2	0	0
CHLORIDE	(CL)-1	702	31000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		9.1
BARIUM	(BA)+2	1.7	120
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) = 1.99

	TEMP	
	°C	°F
CALCINATE INDEX	100	212
CALCIUM CARBONATE SCALING	100	212
CALCIUM SULFATE INDEX	100	212
CALCIUM SULFATE SCALING	100	212
BARIUM SULFATE INDEX	100	212
BARIUM SULFATE SCALING	100	212

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40988, NEW MEXICO 88240

COMPANY ENERGY RESEARCHERS GROUP
DATE 12-12-88
ANALYST/TESTER/ANALYST G. C. H. 0207
SAMPLING POINT: WELLHEAD
DATE SAMPLED 12-7-88

SPECIFIC GRAVITY = 1.058
TOTAL DISSOLVED SOLIDS = 56704
PH = 7.1

		MG/L	MG/L
CATIONS			
CALCIUM	(CA) ²⁺	39.3	758.
MAGNESIUM	(MG) ²⁺	28.6	470.
SODIUM	(NA) CLALC.	895.	20095.
ANIONS			
BICARBONATE	(HCO3) ⁻¹	9.8	597.
CARBONATE	(CO3) ⁻²	0	0
HYDROXIDE	(OH) ⁻¹	0	0
SULFATE	(SO4) ⁻²	0	0
CHLORIDE	(CL) ⁻¹	564	30000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		43.6
BARIUM	(BA) ²⁺	1.4	90.8
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) = 1.005

SCALING INDEX	TEMP	
	50C	48.80
	52F	120F
	103	1503
CARBONATE INDEX	LIVELY	LIVELY
CALCIUM CARBONATE SCALING		
CALCIUM SULFATE INDEX	-48.	-68.
CALCIUM SULFATE SCALING	UNLIKELY	UNLIKELY
BARIUM SULFATE INDEX	-1.3	-2.5
BARIUM SULFATE SCALING	UNLIKELY	UNLIKELY

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HOBBS, NEW MEXICO 88240

COMPANY : ENERGY RESERVES GROUP
DATE : 7-5-84
FIELD : LAASEWELL : OH RANDAL GALIUP
CUMPLING POINT: SEPERATOR
DATE SAMPLED : 6-29-84

SPECIFIC GRAVITY = 1.007
TOTAL DISSOLVED SOLIDS = 11292
PH = 6.08

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	.96	19.3
MAGNESIUM	(MG)+2	.72	8.7
SODIUM	(NA).CALC.	171.	3939.
ANIONS			
BICARBONATE	(HCO3)-1	34	2074.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	26.0	1250
CHLORIDES	(CL)-1	113	6000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		764
BARIUM	(BA)+2	.01	1
MANGANESE	(MN)	NOT RUN	

SONIC STRENGTH (MODAL) = .189

SCALING INDEX	TEMP
	30C 48.8C
	86F 128F
CARBONATE INDEX	-1.4 -1.0
CALCIUM CARBONATE SCALING	UNLIKELY UNLIKELY
CALCIUM SULFATE INDEX	-28. -28.
CALCIUM SULFATE SCALING	UNLIKELY UNLIKELY

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HOBBS, NEW MEXICO 88240

COMPANY : ENERGY RESOURCES
DATE : 5-6-82
FIELD/LEASE/WELL : N.E. HOGEACK WELL#33
SAMPLING POINT:
DATE SAMPLED : 4-28-82

SPECIFIC GRAVITY = 1.04
TOTAL DISSOLVED SOLIDS = 59566
TDS = 6.7

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	70	1402.
MAGNESIUM	(MG)+2	20	243.
SODIUM	(NA), CALC.	936.	21538.
ANIONS			
BICARBONATE	(HCO3)-1	10	610.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	1.6	80
CHLORIDES	(CL)-1	1015.	35991.
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	1	17.0
HYDROGEN	(H2)	NOT RUN	
IRON(TOTAL)	(FE)		3.2
CHROMIUM	(CR)+2	1.0	73.2
MANGANESE	(MN)	NOT RUN	

SCALING INDEX	TEMP
	30C
	86F
	1.952
CARBONATE INDEX	LIKELY
CALCIUM CARBONATE SCALING	
SULFATE INDEX	-34.
CALCIUM SULFATE SCALING	UNLIKELY

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HOBBS, NEW MEXICO 88240

COMPANY : ENERGY RESOURCES

DATE : 5-6-82

FIELD, LEASESWELL : N.E. HOGBACK TANK BATTERY #2

SAMPLING POINT: HEATER TREATER

DATE SAMPLED : 4-25-82

SPECIFIC GRAVITY = 1.027

TOTAL DISSOLVED SOLIDS = 60747

PH = 7.42

		MG/L	MG/L
CATIONS			
CALCIUM	(CA)+2	17.3	347.
MAGNESIUM	(MG)+2	17.6	239.
SODIUM	(NA), CALC.	657.	15110.
ANIONS			
CARBONATE	(HCO3)-1	16.8	1025.
BICARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	.65	31.5
CHLORIDES	(CL)-1	676.	23994.
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
HYDROGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		3.6
CHROMIUM	(CR)+3	.36	25.1
MANGANESE	(MN)	NOT RUN	

SCALING INDEX	TEMP
	30C
	86F
CARBONATE INDEX	1.15
CALCIUM CARBONATE SCALING	LIKELY
SULFATE INDEX	-100
CALCIUM SULFATE SCALING	UNLIKELY

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HOBBS, NEW MEXICO 88240

COMPANY : ENERGY RESOURCES
DATE : 5-6-82
FIELD, LEASE, WELL : N.E. HOGBACK WELL #8
SAMPLING POINT:
DATE SAMPLED : 4-28-82

DENSITY GRAVITY = 1.029
TOTAL DISSOLVED SOLIDS = 43892
PH = 7.12

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	23.3	467.
MAGNESIUM	(MG)+2	12.6	153.
SODIUM	(NA).CALC.	712.	16371.
ANIONS			
BICARBONATE	(HCO3)-1	14.4	878.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	54	26
CHLORIDES	(CL)-1	733.	25994.
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	0	0
NITROGEN SULFIDE	(H2S)	4.5	74.6
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		1.6
BARIUM	(BA)+2	0.07	5.3
MANGANESE	(MN)	NOT RUN	

SCALING INDEX	TEMP
	80C
	80F
CARBONATE INDEX	1.968
CALCIUM CARBONATE SCALING	LIKELY
SULFATE INDEX	-121
CALCIUM SULFATE SCALING	UNLIKELY

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MOBES. NEW MEXICO 88240

COMPANY : CHACE OIL CO.
DATE : 9-5-84
FIELD, LEASE & WELL : JICARILLA 71-30
SAMPLING POINT: SEPERATOR
DATE SAMPLED : 8-27-84

SPECIFIC GRAVITY = 1.01
TOTAL DISSOLVED SOLIDS = 17892
PH = 7.67

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	5	100.
MAGNESIUM	(MG)+2	5	60.7
SODIUM	(NA), CALC.	290.	6674.
ANIONS			
BICARBONATE	(HCO3)-1	13.4	817.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	4.9	237.
CHLORIDES	(CL)-1	282	10000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		1.7
BARIUM	(BA)+2	.03	1.8
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) = .313

SCALING INDEX	TEMP	
	30C	45.2C
	86F	120F
CARBONATE INDEX	.252	.653
CALCIUM CARBONATE SCALING	LIKELY	LIKELY
CALCIUM SULFATE INDEX	-46.	-46.
CALCIUM SULFATE SCALING	UNLIKELY	UNLIKELY

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601 NORTH LEECH

P.O. BOX 1499

HOBBS, NEW MEXICO 88240

COMPANY : CHACE OIL CO.
 DATE : 9-5-84
 FIELD, LEASE, WELL : JICARILLA 71-27
 SAMPLING POINT: SEPERATOR
 DATE SAMPLED : 8-27-84

SPECIFIC GRAVITY = 1.003
 TOTAL DISSOLVED SOLIDS = 6747
 PH = 7.96

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	1.5	30.0
MAGNESIUM	(MG)+2	1.8	22.2
SODIUM	(NA), CALC.	110.	2533.
ANIONS			
BICARBONATE	(HCO3)-1	.6	36.6
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	10.9	525
CHLORIDES	(CL)-1	102	3600
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		1.4
BARIUM	(BA)+2	0	.2
MANGANESE	(MN)	NOT RUN	
IONIC STRENGTH (MOLAL) = .122			
SCALING INDEX			
		TEMP	
		30C	48.6C
		86F	120F
		-1.88	-1.47
CARBONATE INDEX		UNLIKELY	UNLIKELY
CALCIUM CARBONATE SCALING			
CALCIUM SULFATE INDEX		-26.	-26.
CALCIUM SULFATE SCALING		UNLIKELY	UNLIKELY

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HOBBS, NEW MEXICO 88240

COMPANY : LEASE OIL COMPANY
DATE : 4-19-84
WELL : LEASEWELL : WELL 171-14
SAMPLING POINT: SEPARATORS
DATE SAMPLED : 4-11-84

SPECIFIC GRAVITY = 1.009
TOTAL DISSOLVED SOLIDS = 17684
PH = 7.69

		MG/L	KG/L
CATIONS			
CALCIUM	(CA)+2	5.3	106.
MAGNESIUM	(MG)+2	1.3	16.2
SODIUM	(NA), CALC.	289.	6857.
ANIONS			
BICARBONATE	(HCO3)-1	10.6	666.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	3.6	175
CHLORIDES	(CL)-1	182	10000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		11
BARIUM	(BA)+2	.03	2
MANGANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) = .306

SCALING INDEX	TEMP
	30C 48.18C
	88F 120F
CARBONATE INDEX	.206 .687
CALCIUM CARBONATE SCALING	LIKELY LIKELY
CALCIUM SULFATE INDEX	-.06. -.06.
CALCIUM SULFATE SCALING	UNLIKELY UNLIKELY

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603 NORTH LEECH

P.O. BOX 1699

MOORE, NEW MEXICO 88240

COMPANY : CHASE OIL COMPANY
DATE : 4-19-84
FIELD : LEASEWELL : WELL #71-21
SAMPLING POINT : SEPARATORS
DATE SAMPLED : 4-11-84

SPECIFIC GRAVITY = 1.009
TOTAL DISSOLVED SOLIDS = 15495
FM = 8.3

		MG/L	MG/L
CATIONS			
CALCIUM	(CA)+2	2.6	53.4
MAGNESIUM	(MG)+2	2.6	32.3
SODIUM	(NA), CALC.	257.	5910.
ANIONS			
BICARBONATE	(HCO3)-1	7	427.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	1.4	68
CHLORIDES	(CL)-1	254	9000
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		6.4
BARIUM	(BA)+2	.03	2.4
MANCANESE	(MN)	NOT RUN	

IONIC STRENGTH (MOLAL) = .269

SCALING INDEX	TEMP	
	30C	48.5C
	86F	100F
CARBONATE INDEX	.382	.724
CALCIUM CARBONATE SCALING	LIXELY	LIXELY
CALCIUM SULFATE INDEX	-.45.	-.46.
CALCIUM SULFATE SCALING	UNLIKELY	UNLIKELY

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601 NORTH LEECH

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MOBES, NEW MEXICO 88240

COMPANY : ENERGY RESERVES GROUP
 DATE : 7-5-84
 FIELD/LEASE/DEWELL : OH RANDAL DAKOTA
 SAMPLING POINT: REPERATOR
 DATE SAMPLED : 6-29-84

SPECIFIC GRAVITY = 1
 TOTAL DISSOLVED SOLIDS = 48
 pH = 6.29

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+E	.4	8.0
MAGNESIUM	(MG)+2	.2	2.4
SODIUM	(NA).CALC.	.07	45
ANIONS			
BICARBONATE	(HCO3)-1	.6	36.6
ACETATE	(CO3)-2	0	0
CHLORIDE	(CH)-1	0	0
SULFATE	(SO4)-2	.02	1
FLUORIDES	(CL)-1	0	0
DISSOLVED GASES			
ARSEN DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		27.1
ARIUM	(EA)+2	0	.2
MANGANESE	(MN)	NOT RUN	

ONIC STRENGTH (MOLAL) =1E-03

	SCALING INDEX	TEMP
		30C 48.6C
		86F 120F
ARSONATE INDEX	2.66	3.06
CALCIUM CARBONATE SCALING	LIKELY	LIKELY
CALCIUM SULFATE INDEX	-19.	-19.
CALCIUM SULFATE SCALING	UNLIKELY	UNLIKELY

10/15

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HOBBS, NEW MEXICO 88240

COMPANY : ODESSA NATURAL
DATE : 10-14-83
FIELD: LEASEWELL CHACON JICARILLA D 43
SAMPLING POINT: WELLHEAD
DATE SAMPLED : 10-7-83

SPECIFIC GRAVITY = 1.01
TOTAL DISSOLVED SOLIDS = 16158
PH = 5.98

		MG/L	MG/L
CATIONS			
CALCIUM	(CA)+2	10	200.
MAGNESIUM	(MG)+2	39	474.
SODIUM	(NA), CALC.	231.	5325.
ANIONS			
BICARBONATE	(HCO3)-1	6.4	390.
CARBONATE	(CO3)-2	0	0
HYDROXIDE	(OH)-1	0	0
SULFATE	(SO4)-2	3.5	170
CHLORIDES	(CL)-1	270.	9597.
DISSOLVED GASES			
CARBON DIOXIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
OXYGEN	(O2)	NOT RUN	
IRON(TOTAL)	(FE)		3712.
BARIUM	(BA)+2		0.08
MANGANESE	(MN)	NOT RUN	

SCALING INDEX	TEMP
	30C
	86F
CARBONATE INDEX	-1.95
CALCIUM CARBONATE SCALING	UNLIKELY
SULFATE INDEX	-14.
CALCIUM SULFATE SCALING	UNLIKELY

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DOBES, NEW MEXICO 88240

MANN : ENERGY RESERVES GROUP

TS : 5-22-84

WELL : E.H. FIFKIN WELL #6 DAKOTA FIELD

WELLING POINT: WELLHEAD

DATE SAMPLED : 5-15-84

SPECIFIC GRAVITY = 1

TOTAL DISSOLVED SOLIDS = 734

= 7.61

		ME/L	MG/L
CATIONS			
CALCIUM	(CA)+2	.6	12.0
MAGNESIUM	(MG)+2	.5	6.0
SODIUM	(NA) CALC.	9.6	222.
ANIONS			
CARBONATE	(HCO3)-1	3.2	195.
ACETATE	(CO3)-2	0	0
CHLORIDE	(OH)-1	0	0
SULFATE	(SO4)-2	.58	28
FLUORIDES	(CL)-1	7	260
DISSOLVED GASES			
WATER DICHLORIDE	(CO2)	NOT RUN	
HYDROGEN SULFIDE	(H2S)	NOT RUN	
HYDROGEN	(O2)	NOT RUN	
IRON (TOTAL)	(FE)		23.3
COPPER	(BA)+2	.16	11
MANGANESE	(MN)	NOT RUN	

PICO STRENGTH (MOLAL) = .012

SCALING INDEX	TEMP	
	30C 86F	90C 194F
PRECIPITATE INDEX	1.28	3.17
CALCIUM CARBONATE SCALING	LIKELY	LIKELY
CALCIUM SULFATE INDEX	-19.	-19.
CALCIUM SULFATE SCALING	UNLIKELY	UNLIKELY