



Home Office 707 N. Laech, P.O. Box 1400 / Hobbs, MN 55240 / Ph. 506/393-7751, Fax 506/393-6754

May 6, 1991

Mr. Allen Wilson
Marathon Oil Company
P. O. Box 552
Midland, TX 79702

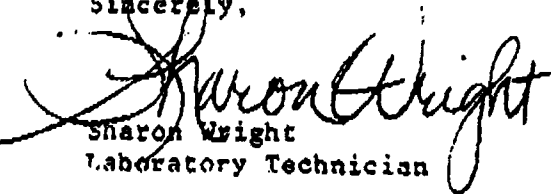
Dear Mr. Wilson:

Enclosed please find requested compatability report as requested from the following locations:

- 70% - City of Carlsbad Fresh Water
- 20% - Johnson B Federal A/C 1 #2
- 2% - Johnson B Federal A/c #1
- 2% - Johnson B Federal
- 2% - Shugart B
- 2% - Statco Federal 10 Fed #2
- 2% - Statco 10 Federal #1 & 3

If you have any questions or require further information, please contact us.

Sincerely,


Sharon Wright
Laboratory Technician

SW/ar

cc: John Offutt
Rick Gaddis
Joe May

Unichem International

707 North Leech

P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON
 Date : 05-06-1991
 Location: COMPATIBILITIES (on)

Specific Gravity:	Sample 1
Total Dissolved Solids:	1.039
pH:	54468
IONIC STRENGTH:	8.16
	1.014

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	98.7	1970
Magnesium	(Mg ⁺²)	32.9	400
Sodium	(Na ⁺¹)	808	18600
Iron (total)	(Fe ⁺²)	0.209	5.85
Barium	(Ba ⁺²)	0.007	0.466
Manganese	(Mn ⁺²)	0.001	0.024

<u>ANIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Bicarbonate	(HCO ₃ ⁻¹)	2.06	126
Carbonate	(CO ₃ ⁻²)	0.560	16.8
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	14.1	679
Chloride	(Cl ⁻¹)	922	32700

DISSOLVED GASES
 Carbon Dioxide (CO₂)
 Hydrogen Sulfide (H₂S)
 Oxygen (O₂)

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium</u>	<u>Calcium</u>
		<u>Carbonate</u>	<u>Sulfate</u>
86°F	30°C	0.89	-39
104°F	40°C	1.5	-39
122°F	50°C	1.8	-39
140°F	60°C	2.2	-39
168°F	76°C	2.7	-36
176°F	80°C	2.9	-36

Comments:

CITY OF CARLSBAD @ 70%; JOHNSON B FEDERAL A/C 1 #2 @ 20%
 2% EACH OF - JOHNSON B FEDERAL AC #1, JOHNSON B FEDERAL, SHUGART B,
 STETCO FED 10 FED #2, STETCO 10 FED #1 & 3

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P.O. Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY

Date : 03-11-1991

Location: COMPATABILITY -

(on 3-8-1991)

	Sample 1
Specific Gravity:	1.025
Total Dissolved Solids:	35565
pH:	8.06
IONIC STRENGTH:	0.696

<u>CATIONS:</u>		me/liter	mg/liter
Calcium	(Ca ⁺²)	94.6	1890
Magnesium	(Mg ⁺²)	49.0	595
Sodium	(Na ⁺¹)	476	11000
Iron (total)	(Fe ⁺²)	0.500	14.0
Barium	(Ba ⁺²)	0.007	0.515

<u>ANIONS:</u>		me/liter	mg/liter
Bicarbonate	(HCO ₃ ⁻¹)	2.06	126
Carbonate	(CO ₃ ⁻²)	0.600	18.0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	7.69	369
Chloride	(Cl ⁻¹)	610	21600

<u>DISSOLVED GASES</u>	
Carbon Dioxide	(CO ₂)
Hydrogen Sulfide	(H ₂ S)
Oxygen	(O ₂)

SCALING INDEX (positive value indicates scale)

Temperature
86°F 30°C

Calcium	Calcium
Carbonate	Sulfate
0.90	~34

Comments:

JOHNSON B FEDERAL A/C #1 = 5% SHUGART B = 5% JOHNSON B FEDERAL = 5%
STETCO 10 FEDERAL #2 = 5% STETCO 10 FEDERAL #1 & 3 = 5%
CITY OF CARLSBAD FRESH WATER = 75%

HALLIBURTON DIVISION LABORATORY

HALLIBURTON SERVICES

ARTESIA DISTRICT

LABORATORY REPORT

No. W101-91

TO Hudson & Hudson

Date March 17, 1991

P. O. Box 9

Maljamar, NM 88264

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Submitted by Dwaine Howard

Date Rec. March 16, 1991

Well No. Shugart B #4

Depth 4030-42

Formation Grayburg

Field Shugart, Queen - SA-00

County Eddy

Source Swab

Resistivity 0.079 @ 70°

Specific Gravity .. 1.0815 @ 70°

pH 7.0

Calcium 6,565

Magnesium 2,759

Chlorides 70,000

Sulfates Over 1,600

Bicarbonates 153

Soluble Iron 250

KCL 0

Remarks:

This water sample was taken after the load water was recovered. It is a representation analysis.

Scott Taylor

Respectfully submitted

Analyst: Scott Taylor - EIT

HALLIBURTON SERVICES

NOTICE.

This report is for information only and the contents are not to be used for any other purpose.

ST-3 78101

UNICEM INTL HOBBS NM P04

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707 North Leach

P.O. Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY

Date : 03-07-1991

Location: JOHNSON "B" FEDERAL 4,5,6,8 (on 6-23-1989)

	Sample 1
Specific Gravity:	1.150
Total Dissolved Solids:	209859
pH:	7.37
IONIC STRENGTH:	3.845

<u>CATIONS:</u>		mg/liter	mg/liter
Calcium	(Ca ⁺²)	356	7120
Magnesium	(Mg ⁺²)	56.0	680
Sodium	(Na ⁺¹)	3200	73500
Iron (total)	(Fe ⁺²)	0.745	20.8
Barium	(Ba ⁺²)	0.086	5.90
<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	2.39	146
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	51.0	2450
Chloride	(Cl ⁻¹)	3550	126000

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		Calcium	Calcium
86°F	30°C	Carbonate	Sulfate
		1.4	16

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P.O.Box 1499

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Company : MARATHON OIL COMPANY

Date : 03-11-1991

Location: JOHNSON B FEDERAL A/C #1 (on 3-8-1991)

Specific Gravity:	Sample 1
Total Dissolved Solids:	1.130
pH:	182031
IONIC STRENGTH:	6.00
	3.598

CATIONS:		me/liter	mg/liter
Calcium	(Ca ⁺²)	544	10900
Magnesium	(Mg ⁺²)	256	3110
Sodium	(Na ⁺¹)	2380	54800
Iron (total)	(Fe ⁺²)	1.61	45.0
Barium	(Ba ⁺²)	0.016	1.10

ANIONS:			
Bicarbonate	(HCO ₃ ⁻¹)	0.800	48.8
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	24.5	1180
Chloride	(Cl ⁻¹)	3160	112000

SCALING INDEX (positive value indicates scale)

Temperature		Calcium	Calcium
86°F	30°C	Carbonate	Sulfate
		-0.37	2.2

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Company : MARATHON OIL COMPANY

Date : 03-07-1991

Location: JOHNSON B FEDERAL - A/C (HT) - (on 2/9/90)

Specific Gravity:	Sample 1
Total Dissolved Solids:	1.143
pH:	200515
Resistivity:	6.95
IONIC STRENGTH:	0.047 ohms @ 71°F
	4.013

<u>CATIONS:</u>		mg/liter	mg/liter
Calcium	(Ca ²⁺)	600	12000
Magnesium	(Mg ²⁺)	360	4370
Sodium	(Na ⁺)	2560	58900
Iron (total)	(Fe ²⁺)	2.61	73.0
Barium	(Ba ²⁺)	0.013	0.900

<u>ANIONS:</u>		mg/liter	mg/liter
Bicarbonate	(HCO ₃ ⁻)	3.80	332
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻)	0	0
Sulfate	(SO ₄ ⁻²)	20.8	1000
Chloride	(Cl ⁻)	2500	124000

SCALING INDEX (positive value indicates scale)

Temperature
86°F 30°C

Calcium	Calcium
Carbonate	Sulfate
1.5	1.6

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Company : MARATHON OIL COMPANY

Date : 03-11-1991

Location: STETCO 10 FEDERAL #1 & 3 (on 3-8-1991)

Specific Gravity:	Sample 1
Total Dissolved Solids:	1.061
pH:	85977
IONIC STRENGTH:	6.60
	1.791

<u>CATIONS:</u>		me/liter	mg/liter
Calcium	(Ca ⁺²)	304	6080
Magnesium	(Mg ⁺²)	216	2620
Sodium	(Na ⁺¹)	1000	23000
Iron (total)	(Fe ⁺²)	2.86	80.0
Barium	(Ba ⁺²)	0.007	0.500
<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	3.20	195
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	22.4	1080
Chloride	(Cl ⁻¹)	1490	53000

SCALING INDEX (positive value indicates scale)

	Temperature	Calcium	Calcium
86°F	30°C	Carbonate	Sulfate
		-0.03	-11

JUL-15-1992 12:36 FROM MID-CONT REG. ENGR. DEPT. TO MOC HOBBS P.03

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Company : MARATHON OIL COMPANY

Date : 03-11-1991

Location: STETCO FEDERAL 10 FED #2 (on 3-8-1991)

Specific Gravity:	Sample 1
Total Dissolved Solids:	1.059
pH:	82908
IONIC STRENGTH:	6.40
	1.637

CATIONS:		me/liter	mg/liter
Calcium	(Ca ⁺²)	220	4400
Magnesium	(Mg ⁺²)	128	1560
Sodium	(Na ⁺¹)	1100	25200
Iron (total)	(Fe ⁺²)	2.65	74.0
Barium	(Ba ⁺²)	0.009	0.600

ANIONS:		me/liter	mg/liter
Bicarbonate	(HCO ₃ ⁻¹)	2.40	146
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	32.8	1580
Chloride	(Cl ⁻¹)	1410	50000

SCALING INDEX (positive value indicates scale)

Temperature
86°F 30°C

Calcium	Calcium
Carbonate	Sulfate
-0.50	-11

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Company : MARATHON OIL COMPANY
Date : 03-11-1991
Location: SHUGART B (on 3-8-1991)

Specific Gravity:	Sample 1
Total Dissolved Solids:	1.105
pH:	146576
IONIC STRENGTH:	6.30
	2.921

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	456	9120
Magnesium	(Mg ⁺²)	224	2720
Sodium	(Na ⁺)	1890	43400
Iron (total)	(Fe ⁺²)	2.47	69.0
Barium	(Ba ⁺²)	0.001	0.100

<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	1.000	61.0
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	27.1	1300
Chloride	(Cl ⁻¹)	2540	90000

SCALING INDEX (positive value indicates scale)

Temperature
86°F 30°C

Calcium	Calcium
Carbonate	Sulfate
-0.32	0.12

CITY OF CARLSBAD
- WATER ANALYSIS REPORT -
CARLSBAD CITY LABORATORY
WASTEWATER TREATMENT PLANT
Carlsbad, New Mexico 88220

SAMPLE SENT BY City of Carlsbad ANALYSIS NO. _____
FROM Double Eagle Well Field SAMPLE RECEIVED Jan. 26, 1987
ADDRESS _____ SAMPLE REPORTED Jan. 27, 1987
WATER SOURCE Composite

PHYSICAL CHARACTERISTICS AS RECEIVED

Color _____ Odor _____ Turbidity 0

CHEMICAL CHARACTERISTICS

	PARTS per MILLION	PPM as CaCO ₃	As CaCO ₃ GRAINS per Gallon
Alkalinity-M:		148	
Alkalinity-P:		0	
Calcium-Ca:	62	156	9.1
Magnesium-MG:	14	56	3.3
Sodium-Na:			
Sulphates-So ₄ :	46		
Chlorides-Cl:	62		
Sp. Cond.:	375		
Iron-Fe:			
Free Chlorine:			
Fluoride:	0.84		
PH: As received:	8.2		
Aquapoise (PHe) at 70°F:			
TOTAL HARDNESS: (As CaCO ₃): . . .		212	12.4
TOTAL DISSOLVED SOLIDS (As CaCO ₃):			

Jose A. Renteria

Unichem International

707 North Leech

P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON OIL COMPANY

Date : 03-11-1991

Location: CITY OF CARLSBAD ~ FRESH WATER (on 3-8-1991)

Specific Gravity:	Sample 1
Total Dissolved Solids:	1.000
pH:	504
IONIC STRENGTH:	8.60
	0.012

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	2.08	41.6
Magnesium	(Mg ⁺²)	3.42	41.6
Sodium	(Na ⁺¹)	2.75	63.2
Iron (total)	(Fe ⁺²)	0.014	0.400
Barium	(Ba ⁺²)	0.007	0.500
<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	2.20	134
Carbonate	(CO ₃ ⁻²)	0.800	24.0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	1.02	49.0
Chloride	(Cl ⁻¹)	4.23	150

SCALING INDEX (positive value indicates scale)

Temperature
86°F 30°C

Calcium	Calcium
Carbonate	Sulfate
0.98	-18

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P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON

Date : 04-16-1992

Location: YOUNG DEEP WATER - OUTLET (on 04-14-1992)

	<u>Sample 1</u>
Specific Gravity:	1.102
Total Dissolved Solids:	142807
pH:	6.50
IONIC STRENGTH:	2.661

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	264	5280
Magnesium	(Mg ⁺²)	88.0	1070
Sodium	(Na ⁺¹)	2110	48600
Iron (total)	(Fe ⁺²)	0.043	1.20
Barium	(Ba ⁺²)	0.006	0.400
Manganese	(Mn ⁺²)	0.009	0.250

<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	3.20	195
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	35.4	1700
Chloride	(Cl ⁻¹)	2430	86000

<u>DISSOLVED GASES</u>		
Carbon Dioxide	(CO ₂)	40.0
Hydrogen Sulfide	(H ₂ S)	17.0

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium</u> <u>Carbonate</u>	<u>Calcium</u> <u>Sulfate</u>
86°F	30°C	0.05	-8.5
100°F	38°C	0.63	-8.3
120°F	49°C	0.94	-8.3
140°F	60°C	1.3	-8.3
168°F	76°C	1.9	-9.5
176°F	80°C	2.0	-9.5

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P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON

Date : 04-16-1992

Location: TOMANO - IPD (on 04-14-1992)

	<u>Sample 1</u>
Specific Gravity:	1.036
Total Dissolved Solids:	49897
pH:	6.30
IONIC STRENGTH:	0.954

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	92.0	1840
Magnesium	(Mg ⁺²)	68.0	826
Sodium	(Na ⁺¹)	706	16200
Iron (total)	(Fe ⁺²)	0.161	4.50
Manganese	(Mn ⁺²)	0.003	0.070

<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	5.00	305
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	14.6	700
Chloride	(Cl ⁻¹)	846	30000

DISSOLVED GASES

Carbon Dioxide	(CO ₂)	60.0
Hydrogen Sulfide	(H ₂ S)	17.0

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium Carbonate</u>	<u>Calcium Sulfate</u>
86°F	30°C	-0.70	-39
100°F	38°C	-0.11	-39
120°F	49°C	0.20	-39
140°F	60°C	0.56	-39
168°F	76°C	1.1	-36
176°F	80°C	1.3	-36

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P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON

Date : 04-16-1992

Location: TOMANO & YOUNG DEEP WATER - COMPATIBILITY (on 04-14-1992)

	<u>Sample 1</u>
Specific Gravity:	1.085
Total Dissolved Solids:	119580
pH:	6.45
IONIC STRENGTH:	2.234

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	221	4420
Magnesium	(Mg ⁺²)	83.0	1010
Sodium	(Na ⁺¹)	1760	40500
Iron (total)	(Fe ⁺²)	0.073	2.03
Barium	(Ba ⁺²)	0.004	0.300
Manganese	(Mn ⁺²)	0.007	0.205

<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	3.65	223
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	30.2	1450
Chloride	(Cl ⁻¹)	2030	72000

<u>DISSOLVED GASES</u>		
Carbon Dioxide	(CO ₂)	45.0
Hydrogen Sulfide	(H ₂ S)	17.0
Oxygen	(O ₂)	0

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium</u>	<u>Calcium</u>
		<u>Carbonate</u>	<u>Sulfate</u>
86°F	30°C	-0.17	-18
100°F	38°C	0.42	-18
120°F	49°C	0.73	-18
140°F	60°C	1.1	-18
168°F	76°C	1.7	-16
176°F	80°C	1.8	-16

Comments:

COMPATIBILITY = TOMANO IPD = 25% & YOUNG DEEP WATER OUTLET = 75%

Unichem International

707 North Leech

P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON

Date : 04-16-1992

Location: TOMANO & YOUNG DEEP WATER - COMPATIBILITY (on 04-14-1992)

	<u>Sample 1</u>
Specific Gravity:	1.052
Total Dissolved Solids:	73124
pH:	6.35
IONIC STRENGTH:	1.381

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	135	2700
Magnesium	(Mg ⁺²)	73.0	887
Sodium	(Na ⁺¹)	1060	24300
Iron (total)	(Fe ⁺²)	0.132	3.68
Barium	(Ba ⁺²)	0.001	0.100
Manganese	(Mn ⁺²)	0.004	0.115

<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	4.55	278
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	19.8	950
Chloride	(Cl ⁻¹)	1240	44000

<u>DISSOLVED GASES</u>		
Carbon Dioxide	(CO ₂)	55.0
Hydrogen Sulfide	(H ₂ S)	17.0
Oxygen	(O ₂)	0

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium</u> <u>Carbonate</u>	<u>Calcium</u> <u>Sulfate</u>
86°F	30°C	-0.47	-34
100°F	38°C	0.12	-34
120°F	49°C	0.43	-34
140°F	60°C	0.79	-34
168°F	76°C	1.4	-31
176°F	80°C	1.5	-31

Comments:

COMPATIBILITY = TOMANO IPD = 75% & DEEP WATER OUTLET = 25

Unichem International

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P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON

Date : 04-16-1992

Location: TOMANO & YOUNG DEEP WATER - COMPATIBILITY (on 04-14-1992)

	<u>Sample 1</u>
Specific Gravity:	1.069
Total Dissolved Solids:	96352
pH:	6.40
IONIC STRENGTH:	1.808

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	178	3560
Magnesium	(Mg ⁺²)	78.0	948
Sodium	(Na ⁺¹)	1410	32400
Iron (total)	(Fe ⁺²)	0.102	2.85
Barium	(Ba ⁺²)	0.003	0.200
Manganese	(Mn ⁺²)	0.006	0.160

<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	4.10	250
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	25.0	1200
Chloride	(Cl ⁻¹)	1640	58000

<u>DISSOLVED GASES</u>		
Carbon Dioxide	(CO ₂)	50.0
Hydrogen Sulfide	(H ₂ S)	17.0
Oxygen	(O ₂)	0

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium Carbonate</u>	<u>Calcium Sulfate</u>
86°F	30°C	-0.35	-27
100°F	38°C	0.23	-27
120°F	49°C	0.55	-27
140°F	60°C	0.91	-27
168°F	76°C	1.5	-23
176°F	80°C	1.6	-23

Comments:

COMPATIBILITY = TOMANO IPD & YOUNG DEEP WATER OUTLET = 50/50 MIX

Unichem International

707 North Leech

P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON

Date : 04-16-1992

Location: TOMANO - HEATER TREATER (on 04-14-1992)

	<u>Sample 1</u>
Specific Gravity:	1.099
Total Dissolved Solids:	138325
pH:	6.40
IONIC STRENGTH:	2.615

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	300	6000
Magnesium	(Mg ⁺²)	108	1310
Sodium	(Na ⁺¹)	1990	45700
Iron (total)	(Fe ⁺²)	0.308	8.60
Barium	(Ba ⁺²)	0.003	0.200
Manganese	(Mn ⁺²)	0.012	0.320

<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	2.20	134
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	24.5	1180
Chloride	(Cl ⁻¹)	2370	84000

DISSOLVED GASES

Carbon Dioxide	(CO ₂)	40.0
Hydrogen Sulfide	(H ₂ S)	68.0

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium</u> <u>Carbonate</u>	<u>Calcium</u> <u>Sulfate</u>
86°F	30°C	-0.18	-13
100°F	38°C	0.41	-13
120°F	49°C	0.72	-13
140°F	60°C	1.1	-13
168°F	76°C	1.6	-15
176°F	80°C	1.8	-15

Unichem International

707 North Leech

P.O.Box 1499

Hobbs, New Mexico 88240

Company : MARATHON

Date : 04-16-1992

Location: YOUNG DEEP WATER - INLET (on 04-14-1992)

	<u>Sample 1</u>
Specific Gravity:	1.100
Total Dissolved Solids:	139520
pH:	6.50
IONIC STRENGTH:	2.594

<u>CATIONS:</u>		<u>me/liter</u>	<u>mg/liter</u>
Calcium	(Ca ⁺²)	268	5360
Magnesium	(Mg ⁺²)	68.0	826
Sodium	(Na ⁺¹)	2070	47600
Iron (total)	(Fe ⁺²)	0.061	1.70
Barium	(Ba ⁺²)	0.006	0.400
Strontium	(Sr ⁺²)	0.006	0.250

<u>ANIONS:</u>			
Bicarbonate	(HCO ₃ ⁻¹)	2.20	134
Carbonate	(CO ₃ ⁻²)	0	0
Hydroxide	(OH ⁻¹)	0	0
Sulfate	(SO ₄ ⁻²)	33.8	1630
Chloride	(Cl ⁻¹)	2370	84000

DISSOLVED GASES

Carbon Dioxide	(CO ₂)	50.0
Hydrogen Sulfide	(H ₂ S)	0

SCALING INDEX (positive value indicates scale)

<u>Temperature</u>		<u>Calcium</u> <u>Carbonate</u>	<u>Calcium</u> <u>Sulfate</u>
86°F	30°C	-0.14	-8.8
100°F	38°C	0.45	-8.8
120°F	49°C	0.76	-8.8
140°F	60°C	1.1	-8.8
168°F	76°C	1.7	-10
176°F	80°C	1.9	-10