MERIDIAN OIL

File-84A-357

August 26, 1988

Mr. David Catanach NMOCD P.O. Box 2088 Santa Fe, NM 87501

> Cedar Hill SWD #1 ORDER SWD - 337

Dear Mr. Catanach:

In maintaining compliance with Rule 701(B) order SWD - 337 enclosed are water analysis reports of fluid samples obtained from the Morrison and Entrada formations.

Three representative water samples were obtained from each zone independently by method of swabbing through tubing. No fluid was injected into the zones prior to swabbing and fresh water was present in the casing during perforating operations.

Two non-affiliated testing labs analyzed the same samples recovered from each of the two intervals.

Sincerely yours,

R. E. Fraley

REF/dj



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or 100					2
#CO ₂ 10					F
25 01 /10	10 15 20	5	70 2	15 1	20 1/4 25 20
& RECOMMENDATIONS:	REMARKS & RECO		0.6	37	Bicarbonate, HCO3
sauce.	Iron, Fe (total) Sulfide, as H ₂ S		0.00	7610	ANIONS Chloride, Cl Sulfate, SO ₄ Carbonate, CO ₁
la (calc.) 3,200	Total Dissolved Solids (calc.)				
K mho	n-nieters)	Conductivity	13.6	3/3	Sodium, Na (calc.) Calcium, Ca Magnesium, Mg Barium, Ba
9.25		pH Specific Gravity, 60/60 F.	me/l	mg/l	CATIONS
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Sampled By		Point) Sampling Point	ced, Supply, etc.	Type of Water (Produced, Supply, etc.)
Water, B/D	Formation W	Depth Fo		\mathcal{L} $\mathcal{S}_{\mathcal{L}}^{Well}$	Lease or Unit
State	or Paris		Legal Description	Leg	Field
Date Sampled	Sample No. Dat	Samp		MERIDIAN OIL COMPANY	Company MERIDIAN

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25 II. 25 20 C. 48	ANIONS Chloride, Cl Sulfate, SO, Carbonate, CO3 Bicarbonate, HCO3	DISSOLVED SOLIDS CATIONS Sodium, Na (calc.) Calcium, Ca Magnesium, Mg Barium, Ba	Lease or Unit Well At Type of Water (Produced, Supply, etc.)	Company MERIDIAN Field
25 10 5	7/80 200.0	mg/l me/l 4097 1789		N OIL COMPANY Legal Description
9 5 15	Iron, Fe (total) Sulfide, as H ₂ S REMARKS &	pH Specific Gravity, 60/60 F. Resistivity (ohm-meters)—// of Conductivity Total Dissolved	Depth Formation Sampling Point	Sample Not 2
20 25 CI /10 ===================================	& RECOMMENDATIONS:	Total Dissolved Solids (calc.) 22 ac	Water, B/D Sampled By M. Manage	Parish State

Scale : email



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	ater (Produced, Supply, etc.) Sampling Point Sampled By SOLIDS OTHER PROPERTIES PH Specific Gravity, 60/60 F. Produced Solids (calc.) Produced Solids (calc.)	ater (Produced, Supply, etc.) Sampling Point Sampled By SOLIDS Mg Mg Mg Mg Mg Mg Mg M	ater (Produced, Supply, etc.) Sampling Point OTHER PROPERTIES PH Specific Gravity, 60/60 F. Resistivity (ohm-meters) Gonductivity Total Dissolution HCO3 REMARKS	Lease or Unit	i	Depth	1 Ars Am	Water, B/D
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Well SWD # Depth Fyrmation	OTHER PROPERTIES mg/l me/l Specific Gravity, 60/60 F. (calc.) Hg Mg 31 A.D Conductivity Total Dissolved Solids (calc.) Sulfide, as H2S Me OTHER PROPERTIES Dissolved Solids (calc.) Resistivity Conductivity Total Dissolved Solids (calc.) Resistivity Sulfide, as H2S Me Mg Mg Mg Mg Mg Mg Mg Mg Mg	OTHER PROPERTIES mg/l me/l Specific Gravity, 60/60 F. Mg 37 Mg 178.4 Conductivity Total Dissolved Solids (calc.) Sulfide, as H ₂ S Mg 180.0 Sulfide, as H ₂ S	Oscillos Colling Conductivity	Type of Water (Produce		Sampling Point		Sampled By
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MERIDIAN OIL COMPANY	Ban	Iron, Fe (total) Sulfide, as H ₂ S	220.0	7810	INIONS hloride, Cl hlfate, SO,
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	te Sampled			OIL	

Scale : erm



20 15	Chloride, Cl Sulfate, SO, Carbonate, CO3 Bicarbonate, HCO3	CATIONS Sodium, Na (calc.) Calcium, Ca Magnesium, Mg Barium, Ba Machine Mg Machine Mg	Type of Water (Produced, Supply, etc.)	Company MERIDIAN OIL COM
5	33 2/3.0	mell pH Specific Ga Resistivity Conductiv	y, etc.) Sampling Point	COMPANY Legal Description
15 20 20	Iron, Fe (total) Sulfide, as H ₂ S REMARKS & RECO	OTHER PROPERTIES pH Specific Gravity, 60/60 F. Resistivity (ohm-meters) // F. Conductivity Total Dissolved Solids (calc.)	Fyrmation Wa	Sample No. Date County or Parish
25 CT /10 SOL 10	& RECOMMENDATIONS:	s (calc.)	Water, B/D Sampled By M. MRanco	Date Sampled h State

Scale : spm



SMITH ENERGY SERVICES a division of Allied Products WATER ANALYSIS

Jul. 11, 1988

Page 1

MERIDIAN OIL INC.

MARK MANSON

Date Sampled: 07-09-88

Well: CEDAR HILL SWD #1

Formation: BLUFF/SUMMERVILLE

Legals:

SEC. 29, T30N, R10W

County: SAN JUAN, N.M.

Report No.: 1

Specific Gravity:

1.010

pH:

Chloride:

6,800.0 mg/l

Calcium:

593 mg/l

Bicarbonate:

61 mg/l

Magnesium:

Sulfate:

 $29 \, mg/1$

400 mg/l Total Iron:

mg/l

Sulfide:

mg/l

Sodium:

2,997 mg/1

Total Hardness:

Resistivity:

1,600 mg/l

Total Diss Solids: 12,380 mg/l

Potassium:

1,500 mg/l

.78 Ohm Meters at 60 Degrees F

Sample Source: SAMPLED WHILE SWABBING.

Remarks:

SAMPLE APPEARS TO BE FORMATION WATER.



SMITH ENERGY SERVICES a division of Allied Products WATER ANALYSIS

Jul. 11, 1988

Page 1

MERIDIAN OIL INC.

MARK MANSON

Date Sampled: 07-09-88

Well: CEDAR HILL SWD #1

Formation: BLUFF/SUMMERVILLE

Legals:

SEC. 29, T30N, R10W

County:

SAN JUAN

Report No.: 2

Specific Gravity: 1.012 pH: Chloride: 7,100.0 mg/lCalcium: Bicarbonate: 61 mg/lMagnesium: Sulfate:

Sulfide:

Total Hardness:

Potassium:

Resistivity:

 $400 \, \text{mg/l}$ mg/l

Total Iron:

mg/l

529 mg/l

38 mg/1

3,250 mg/1Sodium: Total Diss Solids: 12,878 mg/l

1,480 mg/l1,500 mg/l

.68 Ohm Meters at 60 Degrees F

Sample Source: SAMPLED WHILE SWABBING, SAMPLE #2

Remarks: SAMPLE APPEARS TO BE FORMATION WATER.



SMITH ENERGY SERVICES a division of Allied Products WATER ANALYSIS

Jul. 11, 1988

Page 1

MERIDIAN OIL INC.

MARK MANSON

Date Sampled: 07-09-88

Well: CEDAR HILL SWD #1

Formation:

BLUFF/SUMMERVILLE

Legals:

SEC. 29, T30N, R10W

County:

SAN JUAN, N.M.

Report No.:

Specific Gravity: 1.010 pH:

Chloride: Bicarbonate: Sulfate:

Sulfide: mg/lTotal Hardness: 1,440 mg/l

Potassium:

Resistivity:

7,400.0 mg/lCalcium: 397 mg/1Magnesium: 400 mg/l

Total Iron: Sodium:

3,590 mg/1

Total Diss Solids:

13,815 mg/1

453 mg/l

75 mg/l

mg/l

1,500 mg/l.62 Ohm Meters at 60 Degrees F

Sample Source: SAMPLED WHILE SWABBING, SAMPLE #3

Remarks: SAMPLE APPEARS TO BE FORMATION WATER



Formation: ENTRADA

Jul. 7, 1988 Page 1

MERIDIAN OIL INC.

MARK MANSON Legals: SEC29,T32N,R10W Date Sampled: 07-07-88 County: SAN JUAN, N.M.

Well: CEDAR HILL SWD #1 Report No.: 1

Specific Gravity: 1.005 pH: $\overset{9.0}{52}$ mg/1 Chloride: 7,100.0 mg/LCalcium: Bicarbonate: 244 mg/l Magnesium: 10 mg/lSulfate: $900 \, \text{mg/l}$ Total Iron: mg/1Sulfide: Sodium: mg/13,869 mg/1Total Hardness: 170 mg/lTotal Diss Solids: 14,175 mg/l 2,000 mg/1Potassium:

Resistivity: .57 Ohm Meters at 60 Degrees F

Sample Source: 65 BBLS SWABBED

Remarks:



SMITH ENERGY SERVICES a division of Allied Products WATER ANALYSIS

Jul. 7, 1988 Page 1

MERIDIAN OIL INC.

MARK MANSON

Date Sampled: 07-07-88

Well: CEDAR HILL SWD #1

Formation: ENTRADA

Legals: SEC 29,T32N,R10W

County: SAN JUAN, N.M.

Report No.: 2

9.0 Specific Gravity: 1.005 pH: Chloride: 7,500.0 mg/1Calcium: 44 mg/lBicarbonate: 549 mg/lMagnesium: 15 mg/lSulfate: $900 \, \text{mg/l}$ Total Iron: mg/l Sulfide: mg/1Sodium: 4,244 mg/lTotal Hardness: $170 \, \text{mg}/1$ Total Diss Solids: 15,252 mg/1Potassium: 2,000 mg/1Resistivity: .57 Ohm Meters at 60 Degrees F

Sample Source: 68 BBLS SWABBED, AFTER 2 HOURS SHUT IN

Remarks:

POTASSIUM IS GREATER THAN 2000. 2000MG/L IS THE HIGH END

OF THE STRIP TEST.



SMITH ENERGY SERVICES a division of Allied Products WATER ANALYSIS

Jul. 7, 1988

Page 1

MERIDIAN OIL INC.

MARK MANSON

Date Sampled: 07-07-88

Well: CEDAR HILL SWD #1

Formation: ENTRADA

Legals:

SEC 29, T32N, R10W

County:

SAN JUAN, N.M.

Report No.: 3

Specific Gravity: 1.005 pH: 9.0 Chloride: 7,800.0 mg/lCalcium: 52 mg/lBicarbonate: $488 \, \text{mg/l}$ Magnesium: 17 mg/l $900 \, \text{mg/l}$ Sulfate: Total Iron: mg/lSulfide: mg/l Sodium: 4,400 mg/lTotal Hardness: $200 \, \text{mg}/1$ Total Diss Solids: 15,657 mg/lPotassium: 2,000 mg/1

Resistivity:

.55 Ohm Meters at 60 Degrees F

Sample Source: 68 BBLS SWABBED, AFTER 5 HOURS SHUT IN.

Remarks:

SAMPLE APPEARS TO BE ENTRADA FORMATION WATER.

POTASSIUM IS 2000+