

# MERIDIAN OIL

OIL CONSERVATION DIVISION  
RECEIVED

'92 MAY 27 AM 9 04

May 22, 1992

Mr. William J. LeMay  
N. M. Oil Conservation Division  
P. O. Box 2088  
Santa Fe, N.M. 87501-2088

Re: Angel Peak #1 DK/Gal  
1150' FSL; 1090' FWL  
Section 2, T27N R11W  
San Juan County, N. M.

Dear Mr. LeMay:

Meridian Oil Inc. is applying for an administrative downhole commingling order for the referenced well in the Kutz Gallup and Basin Dakota fields. The ownership of the zones to be commingled is common. The offset operators and owners are Arco Oil and Gas Company, BHP Petroleum, Texaco Inc., Amoco Inc., Conoco Inc., and Meridian Oil. The Bureau of Land Management and these offset operators and owners will receive notification of this proposed downhole commingling.

This well has produced since 1960 from the Dakota interval. The Dakota experienced a normal production decline and is currently capable of producing 200 MCF/D & 1.0 BOPD. Its cumulative production is 6,228 MMCF & 56,758 BO as of January 1, 1992.

We propose to commingle the Dakota with the Gallup in this well. The Gallup is a very marginal producing interval and generally requires a pumping unit to lift the oil. The nearest offset, Pipkin #26 (E 12 27 11) initiated production at 8 BOPD and 75 MCF/D in 1989 and is currently capable of only 3 BOPD and 45 MCF/D. Commingling should enable the well to produce Gallup hydrocarbons without pumping equipment since the Dakota gas should be sufficient to lift the oil production. The small amount of oil and gas produced from the Gallup could not justify a drilling expenditure. Granting this application will be in the best interest of conservation, the prevention of waste, and the protection of correlative rights.

We plan to commingle this well by pulling the Dakota tubing, perforating and stimulating the Gallup, and

running a string of production tubing to the lower producing interval.

The reservoir characteristics of each of the subject zones are such that underground waste would not be caused by the proposed downhole commingling. The fluids from each zone are compatible and no precipitates will be formed to cause damage to either reservoir. See the attached fluid analyses from Hillside #1, a nearby Kutz Gallup-Basin Dakota well that was commingled on 12-17-91 (DHC-784) with no detrimental effects. The daily production will not exceed the limit of Rule 303c, Section 1a, Part 1.

The shut-in pressure for the Gallup is estimated to be 550 psi, and the Dakota shut-in pressure is 612 psi.

To allocate the commingled production to each of the zones, Meridian will consult with the District Supervisor of the Aztec District Office of the Division to determine an allocation formula for each of the productive zones. This will be done using flow tests from the Dakota and Gallup during recompletion operations.

Included with this letter is a plat showing ownership of offsetting leases, a copy of the letter to the offset operators and BLM, wellbore diagrams both before and after commingling, production curve for the Dakota, pertinent data sheet, and a detailed report of fluid compatibility.

Yours truly,



P. M. Pippin  
Sr. Production Engineer

PMP:pmp  
attachments

cc: Frank Chavez - OCD

**Pertinent Data Sheet - ANGEL PEAK #1 DK**

**Location:** 1150' FSL 1090' FWL, SEC. 2 T27N R11W, SAN JUAN COUNTY, N.M.

**Field:** Basin Dakota

**Elevation:** 6051' **TD:** 6548'  
10' KB **PBTD:** 6492'

**DP#:** 50373a

**GWI:** 100.00%

**NRI:** 87.50%

**Completed:** 9-12-60

**Initial Potential:**

AOF=18,155 MCF/D Q=8422 MCF/D

SIP:1929 PSI

**Casing Record:**

<u>Hole Size</u>	<u>Csg. Size</u>	<u>Wt. &amp; Grade</u>	<u>Depth Set</u>	<u>Cement</u>	<u>Top/Cmt</u>
15-1/4"	10-3/4"	32.75# SW	294'	330 sx	CIR CMT/SURF.
6-1/4"	5-1/2"	15.5# J-55	6538'	290 sx	2981' @ 50% EFF.
		Stg tool @	2099'	84 sx *	1750' TS
		* Stg tool resq		100 sx	

**Tubing Record:** 2-3/8" 4.7# J-55 6444' 207 Jts  
S.N. @ 6410'

**Formation Tops:**

Ojo Alamo	800'	Menefee	3525'
Kirtland	880'	Point Lookout	4323'
Fruitland	1679'	Gallup	5440'
Pictured Cliffs	1885'	Greenhorn	6251'
Cliffhouse	3544'	Graneros	6307'
Lewis	1964'	Dakota	6409'
Cliffhouse	3409'		

**Logging Record:** Induction Log, GR Forxo Log.

**Stimulation:** Sq DV tool w/100 sx cmt. Perf DK @ 6340'-44', 6354'-58', 6362'-66', 6370'-76', 6410'-16', 6420'-26', 6430'-38', 6445'-49', 6454'-49', 6454'-6462', & fraced w/60,000# sand in water. Found csg leak @ 48', pulled top 2 jts 5-1/2" csg, & replaced.

**Workover History:** None

**Production History:** 1st Delivery= 12-1-60. Dakota Cumulative= 6228 MMCF & 56,758 BO. Capacity = 200 MCF/D & 1 BOPD. Csg pressure = 442 psi. Tbg pressure = 399 psi. Bradenhead = open & dead.

**Pipeline:** EPNG

PMP



PROJECT : XX  
 STATE : NO STATE FOUND  
 COUNTY : SAN JUAN  
 LOCATION : 2M 27N 1  
 PAGE NUMBER: 0000001-A

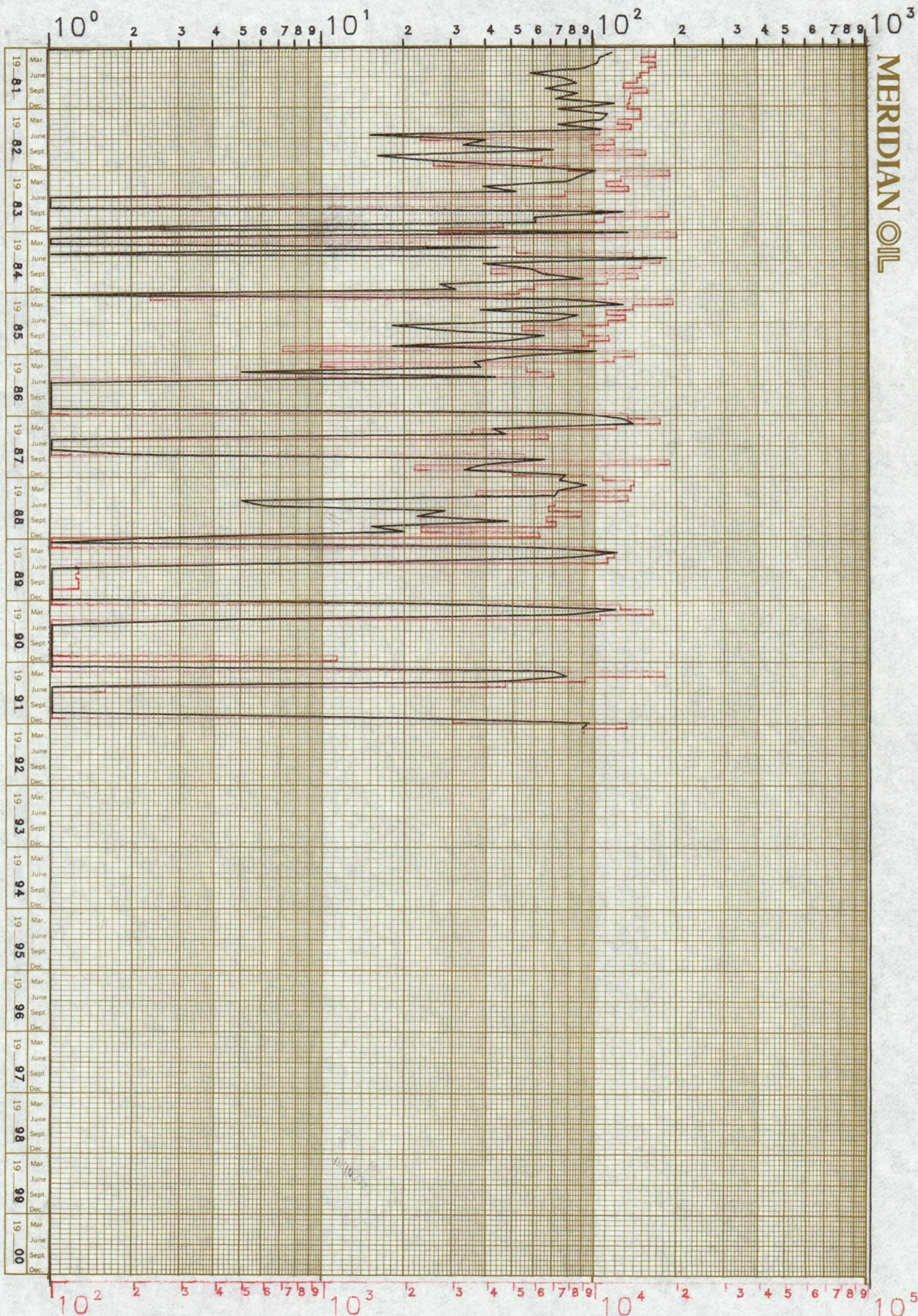
DWIGHTS NUMBER : 30427N11W02M00DK  
 LEASE/WELL NAME : BASIN (DAKOTA)  
 RESERVOIR :  
 FIELD : ANGEL PEAK  
 OPERATOR : MERIDIAN OIL INC

000001

MERIDIAN OIL

GROSS OIL (BBL/M)

(LINEAR)



(HISTOGRAM)

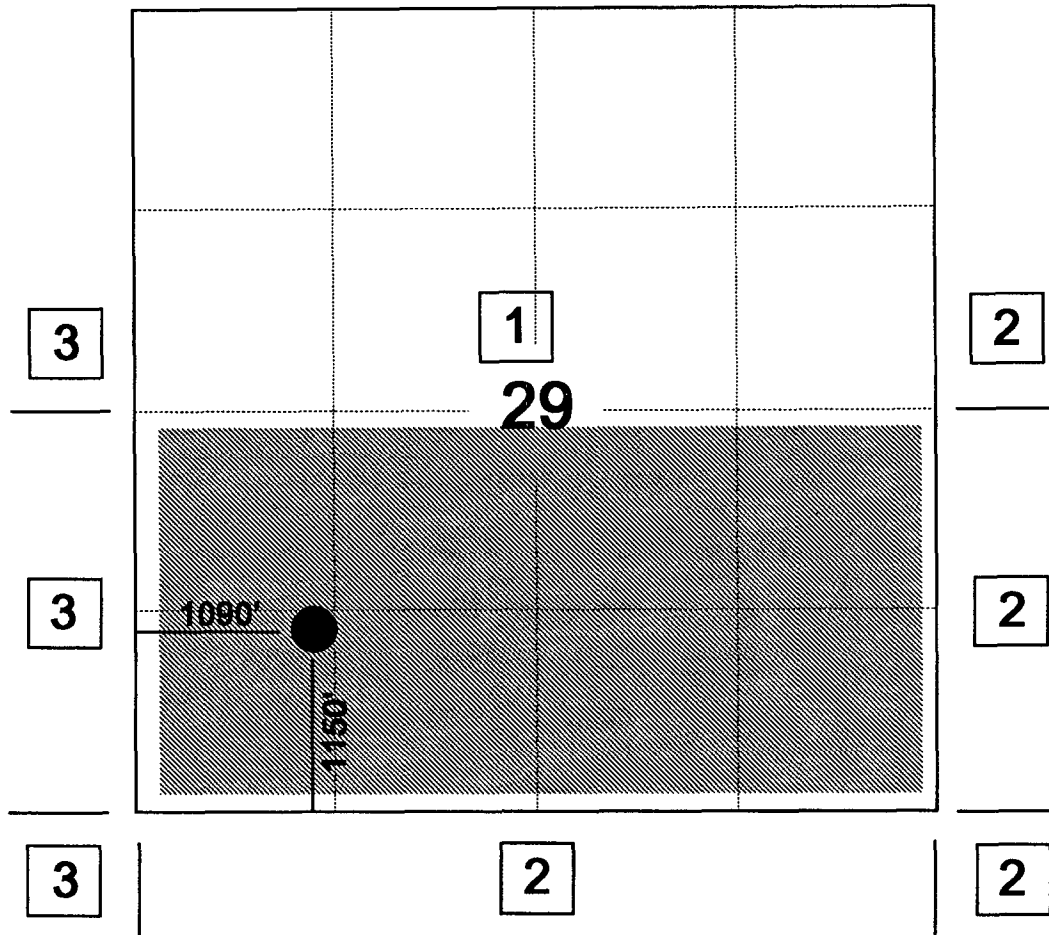
GROSS GAS (MCF/M)

OIL BY MONTH

GAS BY MONTH



**MERIDIAN OIL INC**  
**OFFSET OPERATOR \ OWNER PLAT**  
**Angel Peak #1**  
**Gallup \ Dakota Commingle**  
**Township 27 North, Range 11 West**



1) Texaco Exploration and Production, Inc., PO Box 85771, Dallas, TX 75285

Amoco Production Co., PO Box 800, Denver, CO 80202

Conoco, Inc., PO Box 951063, Houston, TX 75395-1063

2) BHP Petroleum, PO Box 845877, Dallas, TX 75284-5877

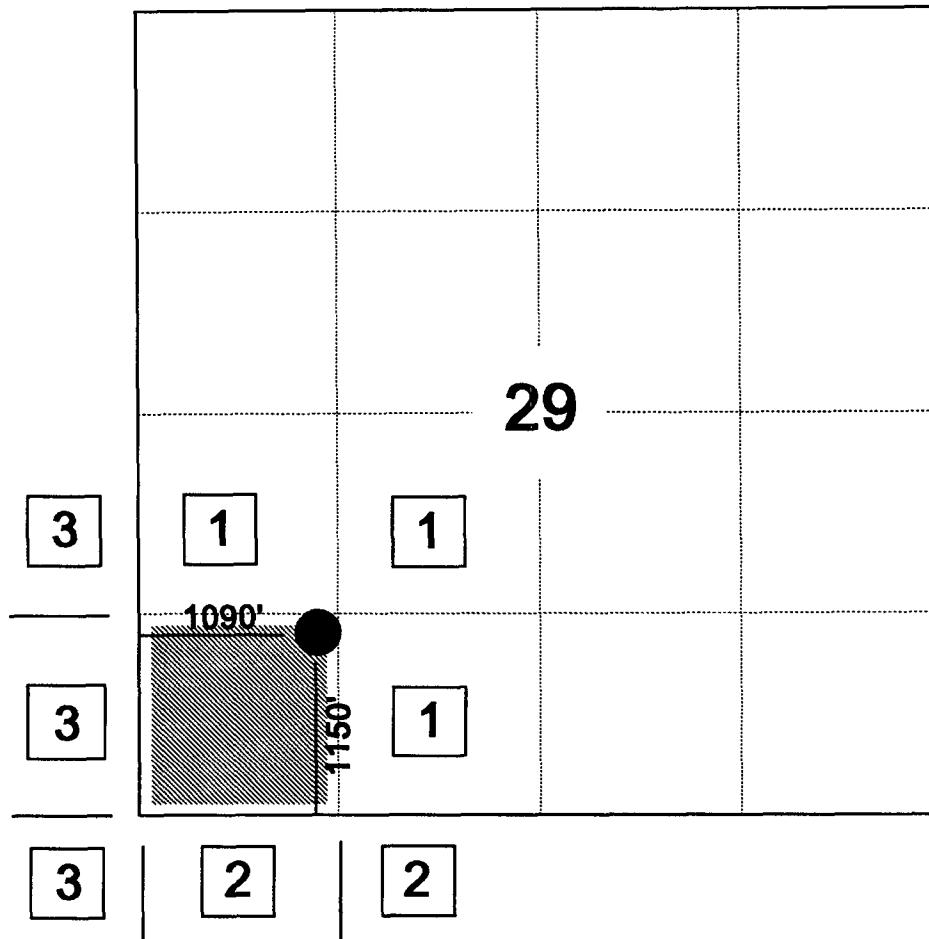
3) ARCO, PO Box 688, Dallas, TX 75221

Amoco Production Company

Conoco, Inc.

**Dakota Formation**

**MERIDIAN OIL INC**  
**OFFSET OPERATOR \ OWNER PLAT**  
**Angel Peak #1**  
**Gallup \ Dakota Commingle**  
 Township 27 North, Range 11 West



1) Meridian Oil Inc

2) BHP Petroleum, PO Box 845877, Dallas, TX 75284-5877

3) ARCO, PO Box 688, Dallas, TX 75221

Amoco Production Co., PO Box 800, Denver, CO 80202

Conoco, Inc., PO Box 951063, Houston, TX 75395-1063

**Gallup Formation**



MERIDIAN OIL  
HILLSIDE #1 - GALLUP  
HILLSIDE #1 - DAKOTA  
LEASE FLUIDS

LABORATORY INVESTIGATION  
OF  
HILLSIDE DAKOTA AND GALLUP FLUIDS COMPATIBILITY  
OCTOBER 25, 1990

PREPARED FOR:

MERIDIAN OIL, INC  
MIKE PIPPIN  
PETROLEUM ENGINEER

PREPARED BY:

BRIAN P. AULT  
PETROLEUM ENGINEER  
WESTERN COMPANY OF  
NORTH AMERICA

SERVICE POINT  
FARMINGTON, NEW MEXICO  
505-327-6222

MERLABINV

MERIDIAN OIL  
HILLSIDE #1 - GALLUP  
HILLSIDE #1 - DAKOTA  
LEASE FLUIDS

#### SUMMARY OF RESULTS

1. No precipitation of materials was observed from either admixture of fluids.
2. Emulsion testing was performed. There should be no serious concern over the formation of a stabilized emulsion at well bore temperatures.
3. The cloud point of oil mixtures dropped or remained the same upon mixing of fluids.
4. According to calculations not enough cool down from gas expansion will occur to alter paraffin deposition significantly.

MERLABINV



MERIDIAN OIL  
HILLSIDE #1 - GALLUP  
HILLSIDE #1 - DAKOTA  
LEASE FLUIDS

On Thursday, October 25, 1990, a request for laboratory work was placed by Mike Pippin, Petroleum Engineer of Meridian Oil, Inc.

PURPOSE

Two oil samples were received of Mr. Pippin with the request we investigate the concern of potentially detrimental effects due to commingling of Gallup and Dakota fluids in the Hillside #1 wellbore.

INVESTIGATION

1. Background information - current wellbore.

- a. Figure 1
- b. Figure 2
- c. BHST Gradient: 1.375° f/100 ft.
- d. Current production problems are primarily due to paraffin deposition from surface down to more/less 1000' depth.
- e. Commingling Order Mixture Requirements:

The commingling requests present the mixing of Hillside #1 Dakota fluids with Hillside #1 Gallup fluids.

The tests performed simulated the mixture of fluids that may result from this commingling action. Each oil component was analyzed for API gravity, paraffin, pour point and cloud point. Each water component was analyzed for dissolved solids, pH, specific gravity and resistivity. The mixture of oils addressed the potential increase in precipitation of materials and the potential increase in paraffin content by a synergistic effect of mixing oils of different constitution. Emulsion tests simulated the mixing environment of the wellbore where the water component of a fluid could be tied up in a resulting emulsion without the ability to break out and allow separation of the oil and water constituents. The emulsion test results

MERIDIAN OIL  
HILLSIDE #1 - GALLUP  
HILLSIDE #1 - DAKOTA  
LEASE FLUIDS

present the number of ml (% of mixture) of water breakout at listed time intervals. The volume of test sample (mixture) used in the emulsion tests is 100 ml.

2. Concerns to address in analysis:

- a. The precipitation of materials produced by the admixture of oils of potentially different constitution.
- b. The creation of emulsions due to the admixture of different fluids.
- c. Increased paraffin deposition by additive properties of oils.
- d. Increased paraffin deposition due to the reduction of temperature accompanying gas expansion.

3. Steps taken in analysis

- a. API Analysis of oils including: API Gravity  
Pour Point  
Cloud Point  
Paraffin Content
- b. Discussion with Mr. Pippen regarding the well bore production environment, e.g., mode of hydrocarbon production, pump type and operation, water components of production fluids, current paraffin problems, etc.
- c. Mixing of oils in appropriate cases with additional cloud point testing to determine resulting fluid characteristics.
- d. API Water Analysis
- e. Emulsion tendency testing via mixing of fluids in appropriate cases.

MERIDIAN OIL  
HILLSIDE #1 - GALLUP  
HILLSIDE #1 - DAKOTA  
LEASE FLUIDS

DATA

SAMPLE #1 - HILLSIDE #1

ZONE	GALLUP
API GRAVITY @ 60° F	34.59°
CLOUD POINT	>40D F*
POUR POINT	40D F
PARAFFIN CONTENT	3.95%

SAMPLE #2 - HILLSIDE #1

ZONE	DAKOTA
API GRAVITY @ 60° F	58.02°
CLOUD POINT	28° F
POUR POINT	<23° F
PARAFFIN CONTENT	0%

SAMPLE #3 50:50 MIX OF HILLSIDE #1 FLUIDS

ZONE	50:50 MIX GAL/DK
API GRAVITY @ 60° F	39.94°
CLOUD POINT	>17°**
POUR POINT	<17° F
PARAFFIN CONTENT	1.94%

\*UNABLE TO ACCURATELY DETERMINE DUE TO THE DARK COLOR OF THE SAMPLE.

\*\*UNABLE TO ACCURATELY DETERMINE DUE TO THE RESULTING DARK MIX

MERIDIAN OIL  
HILLSIDE #1 - GALLUP  
HILLSIDE #1 - DAKOTA  
LEASE FLUIDS

### CALCULATIONS

Cool down effects due to gas expansion:

Reference: Perry's Handbook of Chemical Engineering

RE: Adiabatic Expansion of Ethane, Methane

$$T_s + T_r \left( \frac{P_s}{P_r} \right)^{\frac{K-1}{K}}, \text{ where}$$

$T_s$  = Surface Temperature

$T_r$  = Reservoir Temperature

$P_s$  = Surface Pressure

$P_r$  = Reservoir Pressure

$K = \frac{\text{Specific heat at constant pressure}}{\text{Specific heat at constant volume}}$

Assumed values for maximum cool down due to gas expansion:

$T_s$  = Unknown

$T_r = 160^\circ \text{ F}$

$P_s = 500 \text{ psi}$

$P_r = 2000 \text{ psi}$

$K = 1.2$

$T_s = 160 \left( \frac{500}{2000} \right)^{0.1667}$

$T_s = 127^\circ \text{ F}$

NOTE:

A total cooldown of  $33^\circ \text{ F}$  would be expected



ANALYSIS NO. 54-11-90

API FORM 45-1

FIELD RECEIPT NO. \_\_\_\_\_

## API WATER ANALYSIS REPORT FORM

Company <u>Meridian Oil</u>		Sample No.	Date Sampled <u>10-24-90</u>
Field <u>BASIN DAK / Kutz GAUUP</u>	Legal Description <u>Sec 9, T27N, R11W</u>	County or Parish <u>San Juan</u>	State <u>NM</u>
Lease or Unit	Well <u>Hillside 1</u>	Depth <u>5550 GAL</u> <u>6560 DAK</u>	Formation <u>Dakota</u>
Type of Water (Produced, Supply, etc.) <u>Produced</u>		Sampling Point	Water. B/D
			Sampled By <u>M. Piaper</u>

## DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	<u>606</u>	<u>26.33</u>
Calcium, Ca	<u>16</u>	<u>.80</u>
Magnesium, Mg	<u>3</u>	<u>.22</u>
Barium, Ba	<u>—</u>	<u>—</u>
Potassium, K <sup>+</sup>	<u>11</u>	<u>.28</u>

## ANIONS

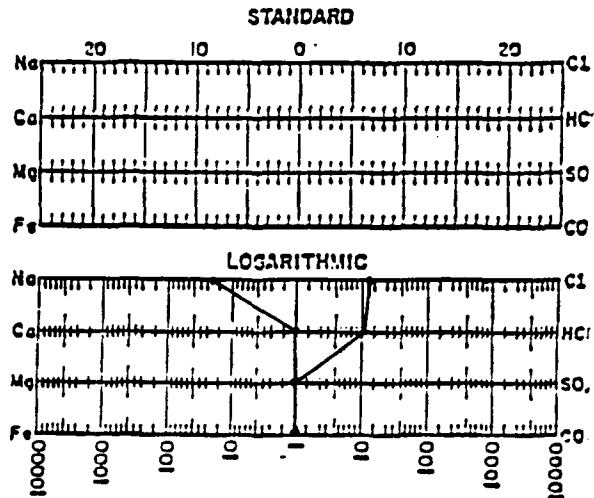
Chloride, Cl	<u>554</u>	<u>15.63</u>
Sulfate, SO <sub>4</sub>	<u>27</u>	<u>.56</u>
Carbonate, CO <sub>3</sub>	<u>0</u>	<u>0</u>
Bicarbonate, HCO <sub>3</sub>	<u>698</u>	<u>11.44</u>
<u>OH</u>	<u>0</u>	<u>0</u>

Total Dissolved Solids (calc.) 1915
 Iron, Fe (total) #, ## 0,0 ppm  
 Sulfide, as H<sub>2</sub>S neg

## OTHER PROPERTIES

pH	<u>7.33</u>
Specific Gravity, 60/60 F.	<u>1.001</u>
Resistivity (ohm-meters) <u>76 F.</u>	<u>3.9</u>
Total hardness	<u>51</u>

## WATER PATTERNS — me/l



REMARKS &amp; RECOMMENDATIONS:

ANALYST: Lee
 THE WESTERN COMPANY OF  
 NORTH AMERICA, FARMINGTON, N  
 (505) 327-6222
Please refer any questions to: **BRIAN AULT** . District Engineer

ANALYSIS NO. 54-12-90

API FORM 45-1

FIELD RECEIPT NO. \_\_\_\_\_

## API WATER ANALYSIS REPORT FORM

Company <u>Meridian Oil</u>		Sample No.	Date Sampled <u>10-24-90</u>	
Field <u>Basin, Dakota / Kutz Gallup</u>	Legal Description <u>Sec. 9, T27N, R11W</u>		County or Parish <u>San Juan</u>	State <u>NM</u>
Lease or Unit	Well <u>Hillside 1</u>	Depth <u>5558</u>	Formation <u>Gallup</u>	Water. B/D
Type of Water (Produced, Supply, etc.) <u>Produced</u>		Sampling Point		Sampled By <u>M. Pippin</u>

## DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	<u>1398</u>	<u>60.78</u>
Calcium, Ca	<u>33</u>	<u>1.64</u>
Magnesium, Mg	<u>12</u>	<u>.96</u>
Barium, Ba	<u>—</u>	<u>—</u>
Potassium, K <sup>+</sup>	<u>151</u>	<u>3.86</u>

ANIONS	mg/l	me/l
Chloride, Cl	<u>2058</u>	<u>58.04</u>
Sulfate, SO <sub>4</sub>	<u>0</u>	<u>0</u>
Carbonate, CO <sub>3</sub>	<u>0</u>	<u>0</u>
Bicarbonate, HCO <sub>3</sub>	<u>561</u>	<u>9.20</u>
OH	<u>0</u>	<u>0</u>

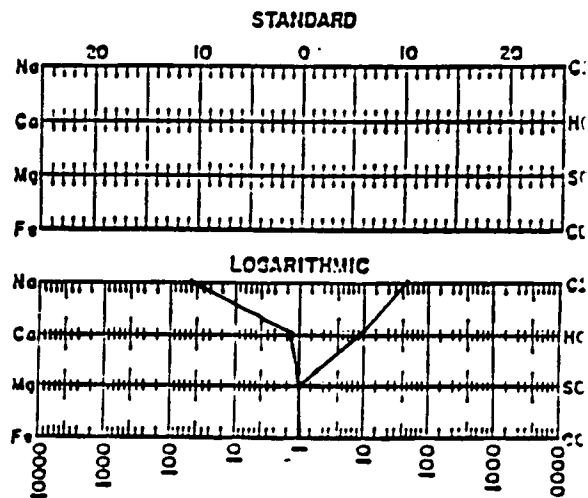
Total Dissolved Solids (calc.) 4,213
 Iron, Fe (total) #, # 0,0 ppm  
 Sulfide, as H<sub>2</sub>S neg

REMARKS &amp; RECOMMENDATIONS:

## OTHER PROPERTIES

pH	<u>7.10</u>
Specific Gravity, 60/60 F.	<u>1.005</u>
Resistivity (ohm-meters) <u>76 F.</u>	<u>1.49</u>
Total hardness	<u>130</u>

## WATER PATTERNS — me/l

ANALYST: Lee
 THE WESTERN COMPANY OF  
 NORTH AMERICA, FARMINGTON, N.M.  
 (505) 327-6222
Please refer any questions to: **BRIAN AULT** . District Engineer

Analysis No. 54-03-90  
Date 10-26-90

The Western Company

Oil Analysis

Operator <u>Meridian Oil</u>	Date Sampled <u>10-24-90</u>
Well <u>Hillside 1</u>	Date Received <u>10-25-90</u>
Field <u>Kutz Gallup</u>	Submitted By <u>Mike Pippin</u>
Formation <u>Gallup</u>	Worked By <u>L Lee</u>
Depth <u>5550'</u>	Sample Description <u>300 ml sample</u>
County <u>San Juan</u>	<u>w/ 17% free H<sub>2</sub>O +</u>
State <u>NM</u>	<u>83% brown oil.</u>

API Gravity 34.59° at 60°F

\*Paraffin Content 3.95 % by weight.

\*Asphaltene Content — % by weight

Pour Point 40 °F

Cloud Point >40 °F

Comments:

Unable to determine cloud point due to dark color of sample.

Analyst L Lee

\*Report calculations and data on back.

Paraffin Content

wt. beaker + sample \_\_\_\_\_  
 - wt. beaker \_\_\_\_\_  
 (wt. sample) 2.0268g

wt. Suchner funnel, watch glass, and filter papers 148.07g

After filtering:

wt. beaker + paraffin residue 98.16  
 - wt. beaker (from above) 98.16g  
 (wt. paraffin in beaker) 0

wt. funnel, glass, papers + paraffin residue 148.15  
 - wt. funnel, watch glass filter papers from above 148.07g  
 (wt. paraffin in these) .08

Total wt. paraffin:

wt. paraffin in beaker 0  
 + wt. paraffin in others .08  
 Total paraffin .08 grams

Paraffin content (%) =

$$\frac{.08}{2.0268} \times 100 = \frac{\text{Total paraffin}}{\text{Sample wt.}} = \underline{3.95} \%$$

Asphaltene Content

wt. tube + sample \_\_\_\_\_  
 - wt. tube \_\_\_\_\_  
 (wt. sample) \_\_\_\_\_

wt. tube & residue \_\_\_\_\_  
 - wt. tube \_\_\_\_\_  
 (wt. residue) \_\_\_\_\_

Asphaltene content (%)

$$\frac{\text{wt. residue}}{\text{wt. sample}} \times 100 = \underline{\hspace{2cm}}$$



Analysis No. 54-02-90  
Date 10-26-90

The Western Company

Oil Analysis

Operator <u>Meridian Oil</u>	Date Sampled <u>10-24-90</u>
Well <u>Hillside 1</u>	Date Received <u>10-25-90</u>
Field <u>Basin DAKOTA</u>	Submitted By <u>Mike Pippin</u>
Formation <u>Dakota</u>	Worked By <u>hee</u>
Depth <u>6550'</u>	Sample Description <u>425 ml sample</u>
County <u>San Juan</u>	<u>w / 21% free H<sub>2</sub>O + 96% clear yellowish brown oil.</u>
State <u>NM</u>	

API Gravity 58.02° at 60°F

\*Paraffin Content 0 % by weight

\*Asphaltene Content — % by weight

Pour Point 423 °F

Cloud Point 28 °F

Comments:

Analyst hee

\*Report calculations and data on back.

Paraffin Content

wt. beaker + sample \_\_\_\_\_  
 - wt. beaker \_\_\_\_\_  
 (wt. sample) 2.013 g

wt. Buchner funnel, watch glass, and filter papers 187.02 g

After filtering:

wt. beaker + paraffin residue 95.68 g  
 - wt. beaker (from above) 95.68 g  
 (wt. paraffin in beaker) 0

wt. funnel, glass, papers + paraffin residue 187.02 g  
 - wt. funnel, watch glass filter papers from above 187.02 g  
 (wt. paraffin in these) 0

Total wt. paraffin:

wt. paraffin in beaker 0  
 + wt. paraffin in others 0  
 Total paraffin 0 grams

Paraffin content (%) =

$\frac{\text{Total paraffin}}{\text{Sample wt.}} \times 100 = \underline{0} \%$

Asphaltene Content

wt. tube + sample \_\_\_\_\_  
 - wt. tube \_\_\_\_\_  
 (wt. sample) \_\_\_\_\_

wt. tube & residue \_\_\_\_\_  
 - wt. tube \_\_\_\_\_  
 (wt. residue) \_\_\_\_\_

Asphaltene content (%)

$\frac{\text{wt. residue}}{\text{wt. sample}} \times 100 = \underline{\hspace{2cm}}$

Analysis No. 54-04-90  
Date 10-29-90

The Western Company

Oil Analysis

Operator <u>Meridian Oil</u>	Date Sampled <u>10-24-90</u>
Well <u>Hillside 1</u>	Date Received <u>10-25-90</u>
Field <u>Kutz Gallup/Basin DAK.</u>	Submitted By <u>Mike Pippin</u>
Formation <u>Gallup / Dakota</u>	Worked By <u>Lhee</u>
Depth <u>5550' - 6550'</u>	Sample Description <u>50/50 mix</u>
County <u>San Juan</u>	<u>of Hillside 1 Gallup oil</u>
State <u>NM</u>	<u>+ Hillside 1 Dakota oil.</u>

API Gravity 39.94 ° at 60°F

\*Paraffin Content 1.94 % by weight.

\*Asphaltene Content — % by weight

Pour Point <17 °F

Cloud Point >17 °F

Comments:

Unable to determine cloud point due to dark color of sample.

Analyst Lhee

\*Report calculations and data on back.

Paraffin Content

wt. beaker + sample \_\_\_\_\_  
 - wt. beaker 98.16  
 (wt. sample) 2.0600 g

wt. Buchner funnel, watch glass, and filter papers 187.02

After filtering:

wt. beaker + paraffin residue 98.16  
 - wt. beaker (from above) 98.16  
 (wt. paraffin in beaker) 0

wt. funnel, glass, papers + paraffin residue 187.06  
 - wt. funnel, watch glass filter papers from above 187.02  
 (wt. paraffin in these) .04

Total wt. paraffin:

wt. paraffin in beaker 0  
 + wt. paraffin in others .04  
 Total paraffin .04 grams

Paraffin content (%) =

$$\frac{.04}{2.0600} \times 100 = \frac{1.94}{\text{Sample wt.}} \%$$

Asphaltene Content

wt. tube + sample \_\_\_\_\_  
 - wt. tube \_\_\_\_\_  
 (wt. sample) \_\_\_\_\_

wt. tube & residue \_\_\_\_\_  
 - wt. tube \_\_\_\_\_  
 (wt. residue) \_\_\_\_\_

Asphaltene content (%)

$$\frac{\text{wt. residue}}{\text{wt. sample}} \times 100 = \underline{\hspace{2cm}}$$



ANALYSIS #  
DATE: 10-29-90

water  
Fig. 1  
OIL-EMULSION TESTS DATA SHEET

OPERATOR: Meridian Oil  
WELL: Hillside 1  
FIELD: Basin Dakota/Kutz Gallup  
FORMATION: Gallup/Dakota  
DEPTH: 5550 - 6550'  
COUNTY: San Juan

SUBMITTED BY: Mike Pippin  
SOURCE OF SAMPLE: Produced  
DATE SAMPLED: 10-24-90  
DATE RECEIVED: 10-25-90  
API GRAVITY OF OIL: 39.9

TYPE & CONC. OF FLUID: 50/50 mix of Gallup/Dakota fluids  
~~TYPE & CONC. OF EMULSION:~~ Hillside 1 oil or water  
~~TYPE & CONC. OF SOLIDS:~~  
TEST TEMPERATURE: 78°F  
~~OIL/TREATMENT FLUID RATIO:~~  
ANALYSIS BY: L Lee

water  
PERCENTAGE OF ORIGINAL AGED SEPARATED AT VARIOUS TIME INTERVALS AFTER EMULSIFYING

Test Number	1															
Additives & Concentration, Gal/1000 Gal	25ml H <sub>2</sub> O 25ml D H <sub>2</sub> O 25ml oil 25ml D oil															
Elapsed Time	Time	Vol	Time	Vol	Time	Vol	Time	Vol	Time	Vol	Time	Vol	Time	Vol	Time	Vol
1 min	1	50	2		3		4		5		6		7		8	
2	2		3		4		5		6		7		8		9	
3	3		4		5		6		7		8		9		10	
4	4		5		6		7		8		9		10		11	
5	5		6		7		8		9		10		11		12	
6	6		7		8		9		10		11		12		13	
7	7		8		9		10		11		12		13		14	
8	8		9		10		11		12		13		14		15	
9	9		10		11		12		13		14		15		16	
10	10		11		12		13		14		15		16		17	
20	20		21		22		23		24		25		26		27	
30	30		31		32		33		34		35		36		37	
Total Vol (ml)	50															
Vol. Emulsion / Sludge	0															
Solids*	—															
Interface**	—															
Vol. Sediment	—															

REMARKS:

\* Preferential wetting of solids: OB=oil-wet bottom; OO=oil-wet oil phase; WB=water-wet bottom; WO=water-wet oil phase  
OI=oil-wet interface; WI=water-wet interface

\*\* Interface: F=Fluid; S=Solid; V=Viscous

25 ml Hillside 1 Gallup oil + 25 ml Hillside 1 Dakota oil + 25 ml Hillside 1 Gallup water + 25 ml Hillside 1 Dakota water.

\* 50 ml of the 50 ml water separated in 1 minute @ 78°F.  
Approximately 2 ml of the 50 ml oil adhered to the side of glass in the water phase.

# MERIDIAN OIL

May 22, 1992

BHP Petroleum  
P.O. Box 845877  
Houston, Texas 75284-5877

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for their Angel Peak #1 GAL/DK well located 1150' FSL 1090' FWL, Section 02 T27N R11W, N.M.P.M., San Juan County, New Mexico, in the Kutz Gallup and Basin Dakota.

The purpose of this letter is to notify you of such action.

Yours truly,

P. M. Pippin  
Sr. Production Engineer

PMP:pmp

# MERIDIAN OIL

May 22, 1992

Conoco Inc.  
P.O. Box 951063  
Houston, Texas 75395-1063

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for their Angel Peak #1 GAL/DK well located 1150' FSL 1090' FWL, Section 02 T27N R11W, N.M.P.M., San Juan County, New Mexico, in the Kutz Gallup and Basin Dakota.

The purpose of this letter is to notify you of such action.

Yours truly,

P. M. Pippin  
Sr. Production Engineer

PMP:pmp

# MERIDIAN OIL

May 22, 1992

Amoco Production Company  
P.O. Box 800  
Denver, Co 80202

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for their Angel Peak #1 GAL/DK well located 1150' FSL 1090' FWL, Section 02 T27N R11W, N.M.P.M., San Juan County, New Mexico, in the Kutz Gallup and Basin Dakota.

The purpose of this letter is to notify you of such action.

Yours truly,

P. M. Pippin  
Sr. Production Engineer

PMP:pmp



# MERIDIAN OIL

May 22, 1992

Texaco Inc.  
P.O. Box 85771  
Dallas, Texas 75285

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for their Angel Peak #1 GAL/DK well located 1150' FSL 1090' FWL, Section 02 T27N R11W, N.M.P.M., San Juan County, New Mexico, in the Kutz Gallup and Basin Dakota.

The purpose of this letter is to notify you of such action.

Yours truly,

P. M. Pippin  
Sr. Production Engineer

PMP:pmp

# MERIDIAN OIL

May 22, 1992

Arco Oil and Gas Company  
P.O. Box 688  
Dallas, Texas 75221

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for their Angel Peak #1 GAL/DK well located 1150' FSL 1090' FWL, Section 02 T27N R11W, N.M.P.M., San Juan County, New Mexico, in the Kutz Gallup and Basin Dakota.

The purpose of this letter is to notify you of such action.

Yours truly,

P. M. Pippin  
Sr. Production Engineer

PMP:pmp

# MERIDIAN OIL

May 22, 1992

Bureau of Land Management  
1235 La Plata Hwy.  
Farmington, N. M. 87401

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for their Angel Peak #1 GAL/DK well located 1150' FSL 1090' FWL, Section 02 T27N R11W, N.M.P.M., San Juan County, New Mexico, in the Kutz Gallup and Basin Dakota.

The purpose of this letter is to notify you of such action.

Yours truly,

P. M. Pippin  
Sr. Production Engineer

PMP:pmp



STATE OF NEW MEXICO  
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION  
AZTEC DISTRICT OFFICE

1000 RIO BRAZOS ROAD  
AZTEC, NEW MEXICO 87410  
(505) 334-6178

Date: May 27, 1992

Oil Conservation Division  
P.O. Box 2088  
Santa Fe, NM 87504-2088

RE: Proposed MC \_\_\_\_\_  
Proposed NSL \_\_\_\_\_  
Proposed WFX \_\_\_\_\_  
Proposed NSP \_\_\_\_\_

Proposed DHC X \_\_\_\_\_  
Proposed SWD \_\_\_\_\_  
Proposed PMX \_\_\_\_\_  
Proposed DD \_\_\_\_\_

Gentlemen:

I have examined the application received on May 27, 1992  
for the Meridian Angel Peak #1  
OPERATOR LEASE & WELL NO.

M-2-27N-11W and my recommendations are as follows:  
UL-S-T-R

Approve

Yours truly,

31.8

92 JUN 1 AM 10 55  
RECEIVED  
OIL CONSERVATION DIVISION