



STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

1000 THE HIAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6170

OIL CONSERVATION DIVISION
BOX 2088
SANTA FE, NEW MEXICO 87501

DATE 8-24-88

RE: Proposed HC _____
Proposed DIIC X _____
Proposed NSL _____
Proposed SWD _____
Proposed WFX _____
Proposed PMX _____

Gentlemen:

I have examined the application dated 8-23-88
for the Union Texas Petroleum Corp. Congress Lachman #4E C-18-28N-10W
Operator Lease and Well No. Unit, S-T-R

and my recommendations are as follows:

Approve

Yours truly,

Ernie Busch

Approved

9-19-88

DHC-703



Union Texas Petroleum

375 U.S. Highway 64
Farmington, New Mexico 87401
Telephone (505) 325-3587

August 18, 1988

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

re: Congress Lachman #4E (SF-047039-C)
940' FNL & 1820' FWL
Section 18, T28N-R10W
San Juan County, New Mexico

RECEIVED

AUG 23 1988

OIL CON. DIV
DIST. 2

Dear Mr. LeMay:

Union Texas Petroleum is applying for a downhole commingling order for the referenced well in the Basin Dakota/Armenta Gallup fields. Ownership of the two zones to be commingled is common. The Bureau of Land Management and the offset operators indicated in the attached plats will receive notification of this proposed downhole commingling.

The subject well was drilled and completed during February, 1983 in both the Dakota and Gallup formations. The Gallup formation was fracture stimulated with 309,500# sand in 105,543 gallons 75 quality foam in three stages. The Dakota formation was fracture stimulated with 86,000# sand in 143,000 gallons nitrified slick water. CAOF of the Dakota zone (3-22-83) was 323 MCFD. Initial production from the Gallup formation (4-16-83) was 31 BOPD and 324 MCFD. First year's production averaged 39 MCFD and 0.1 BOPD from the Dakota and 156 MCFD and 1.2 BOPD from the Gallup. The Gallup formation is currently produced with a plunger lift system, and the Dakota is flowing from below a packer. Two tubing strings are utilized. Most recent production from the Dakota averages 15 MCFD and a trace of oil, and the Gallup averages 30 MCFD and a trace of oil and water. Total liquid production from both zones is negligible.

This is a poor well and continued production will depend on few or no additional expenses and additional recoverable reserves from a planned workover to open and test the Chacra formation in this wellbore. It is planned to stimulate and test the Chacra formation. If economic, the commingled Gallup-Dakota stream will be produced up a tubing string from below a packer, and the Chacra stream up another tubing string. The proposed commingling will result in recovery of additional hydrocarbons from both the Gallup and Dakota formations, thereby preventing waste, and will not violate correlative rights. Commingling of the two zones will result in a more efficient operation by helping to lift the very small amount of produced liquids from each zone without the aid of the plunger lift currently used on the Gallup.

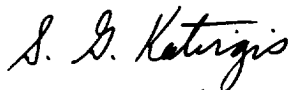
NMOCD
August 18, 1988
Page Two

The attached fluid analysis is from the Gallup and Dakota zones of the Angel Peak B #24E, an offset well approximately half mile to the southwest. The Gallup and Dakota zones were similarly commingled in this wellbore during October, 1986, as per Administrative Order No. DHC-602. The trace amount of liquids produced in the subject well will be similar to the Angel Peak B #24. The analysis indicates the total value of crude will not be reduced by the commingling. The reservoir characteristics of each of the zones are such that underground waste would not be caused by the proposed downhole commingling. The calculated static bottom hole pressure, based on surface pressure and fluid measurements, is 310 psi in the Gallup and 430 psi in the Dakota, well within the limits of Rule 303-C, Section 1(b), Part (6). The small amount of fluids from each zone are compatible and no precipitates will be formed as a result of commingling to damage either reservoir. Current flow tests indicate the daily liquid production will not exceed the limit of Rule 303-C, Section 1(a), Parts (1) and (3).

The Division Aztec District Office will be notified any time the commingled well is shut in for seven consecutive days. To allocate the commingled production to each zone, Union Texas Petroleum will consult with the supervisor of the Aztec District Office and determine an allocation for each of the producing zones.

Included with this letter are two plats showing ownership of offsetting leases, a production curve of each zone, Form C-116 (GOR test), a Fluid Analysis Report, and a wellbore diagram showing the proposed downhole configuration after commingling.

Yours truly,



S. G. Katirgis
Production Engineer

cc: NMOCD - Aztec
M. R. Herrington
W. K. Cooper

NEW MEXICO OIL CONSERVATION COMMISSION
GAS-OIL RATIO TESTS

Operator Union Texas Petroleum		Pool Armenta Gallup/Basin Dakota		County San Juan										
375 US Hwy 64, Farmington, New Mexico 87401				TYPE OF TEST - (X)										
LEASE NAME	WELL NO.	LOCATION			DATE OF TEST	CHOKE SIZE	TBG. PRESS.	DAILY ALLOWABLE	ENGIN. TEST HOURS	PROD. DURING TEST				GAS - OIL RATIO CU.FT./BBLS.
		U	S	T						R	WATER BBLs.	GRAV. OIL	OIL BBLs.	
Congress Lachman (Gallup)	4E	C	18	28N	10W	2/9/88	92		24	0		0	48	N/A
Congress Lachman (Dakota)	4E	C	18	28N	10W	2/9/88	211		24	0		0	18	N/A

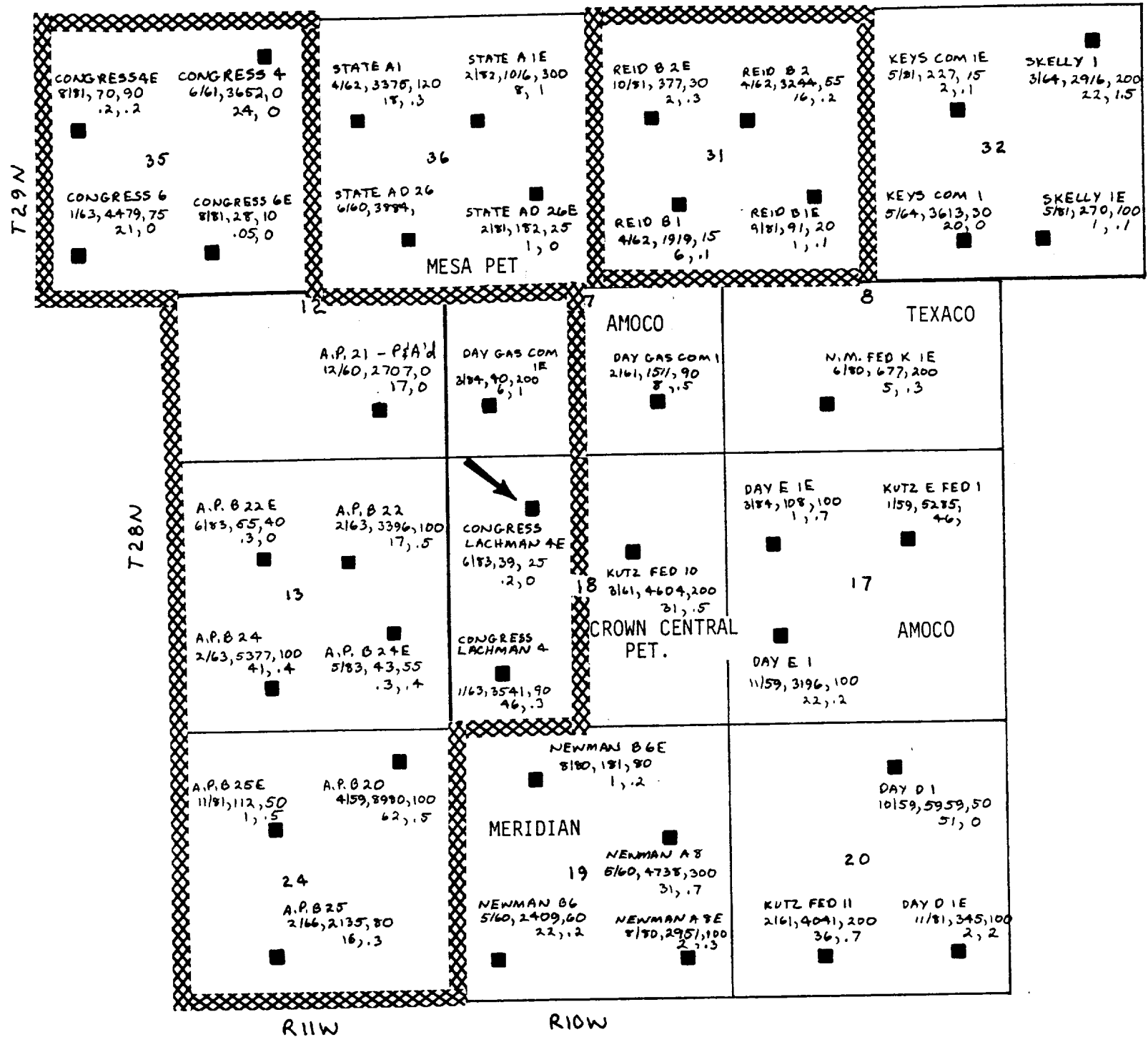
RECEIVED
AUG 23 1988
OIL CON. DIV.
DIST. 3

I hereby certify that the above information is true and complete to the best of my knowledge and belief.

No well will be assigned an allowable greater than the amount of oil produced on the official test.
During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in which well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in order that well can be assigned increased allowables when authorized by the Commission.
Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. Specific gravity base will be 0.60.
Report casing pressure in lieu of tubing pressure for any well producing through casing.
Well original and one copy of this report to the district office of the New Mexico Oil Conservation Commission in accordance with Rule 101 and appropriate pool rules.



L. G. Ketting
Production Engineer

LAND PLAT - DAKOTA FORMATION

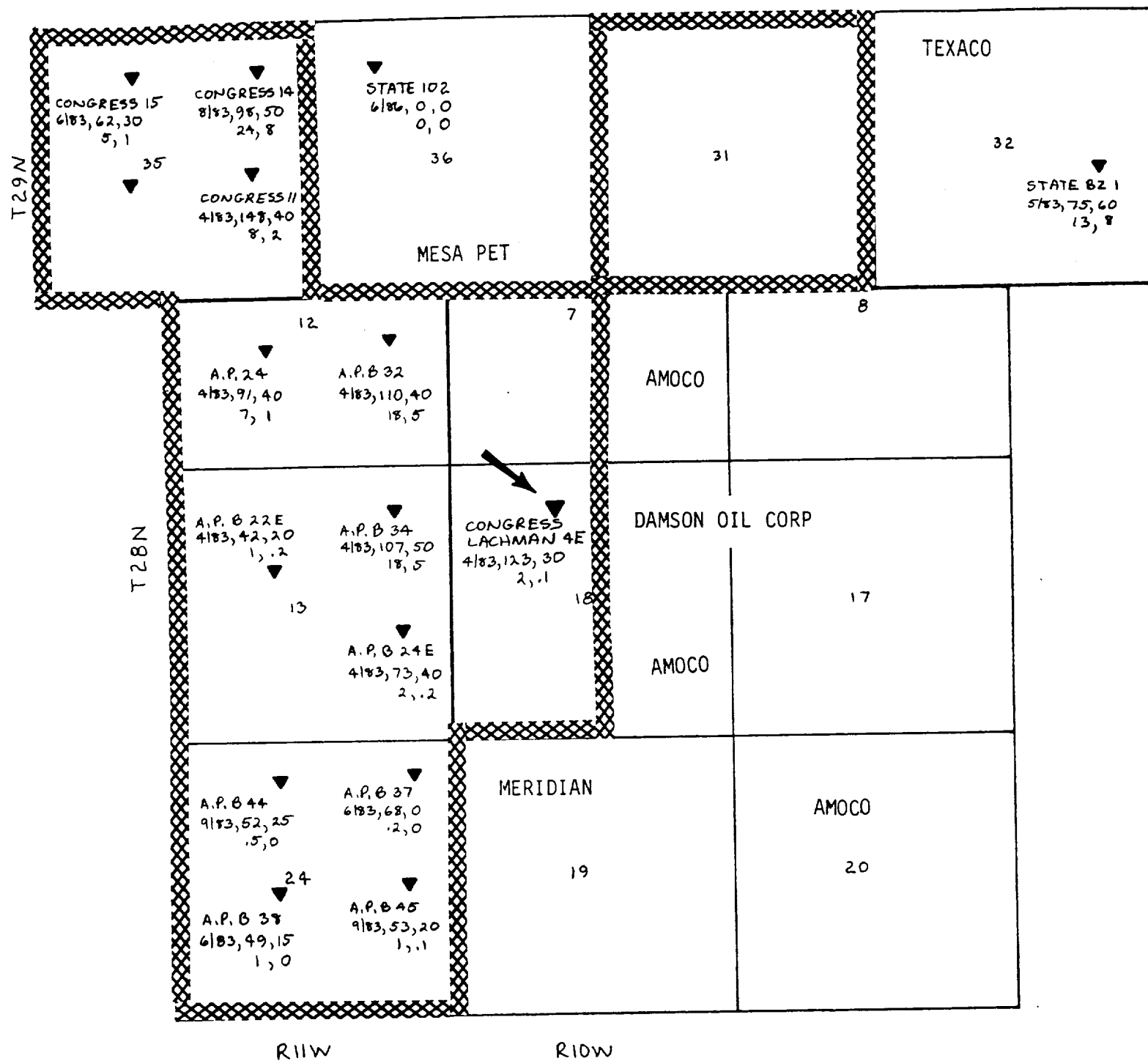


LEGEND

Date 1st Prod, Cum Gas (MMCF), Capacity (MCFD) .
Cum Oil (MBO), Capacity (BOPD)

 UNION TEXAS PET. ACREAGE
 SUBJECT WELL

LAND PLAT - GALLUP FORMATION



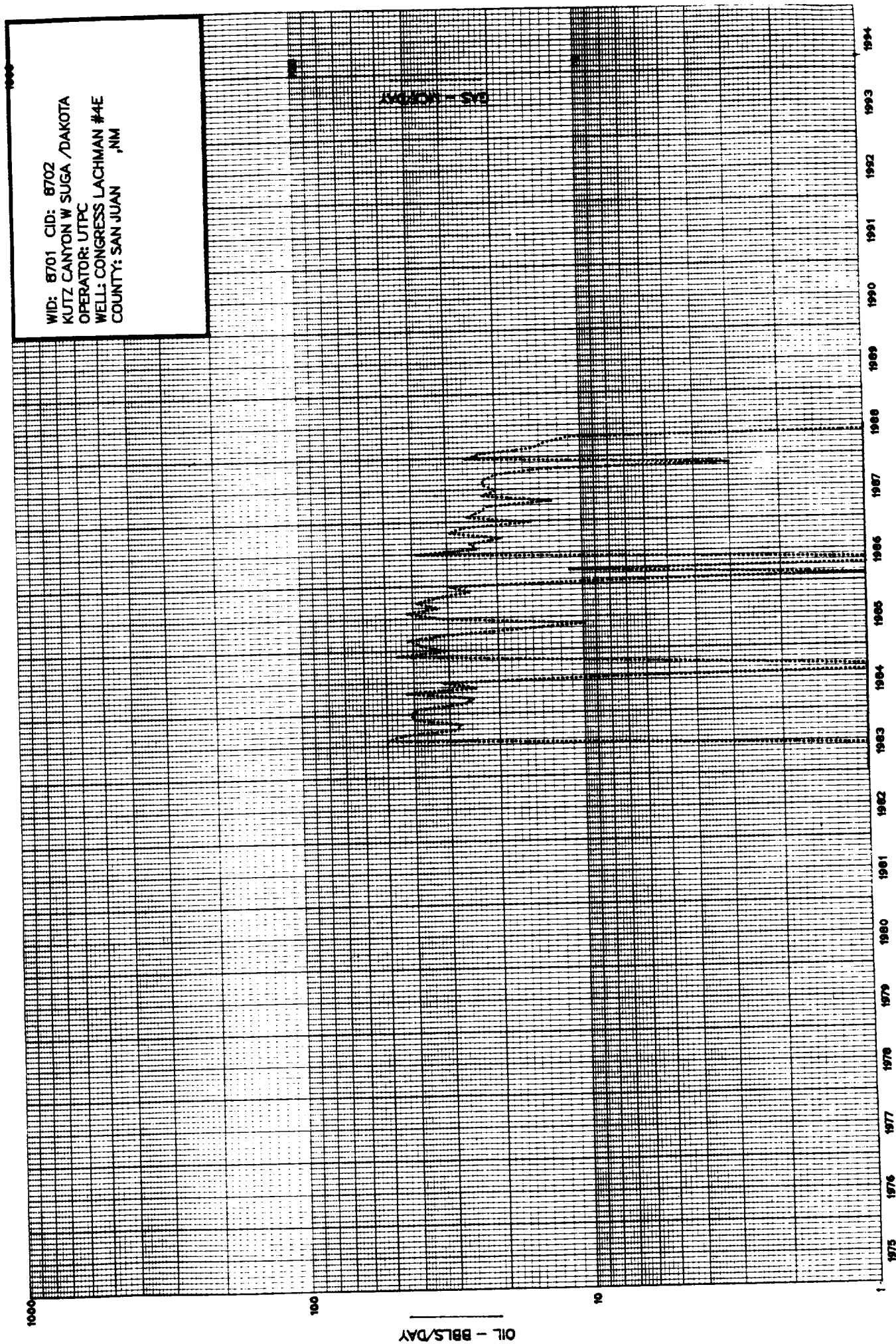
LEGEND

Date 1st Prod, Cum Gas (MMCF), Capacity (MCFD)
Cum Oil (MBO), Capacity (BOPD)

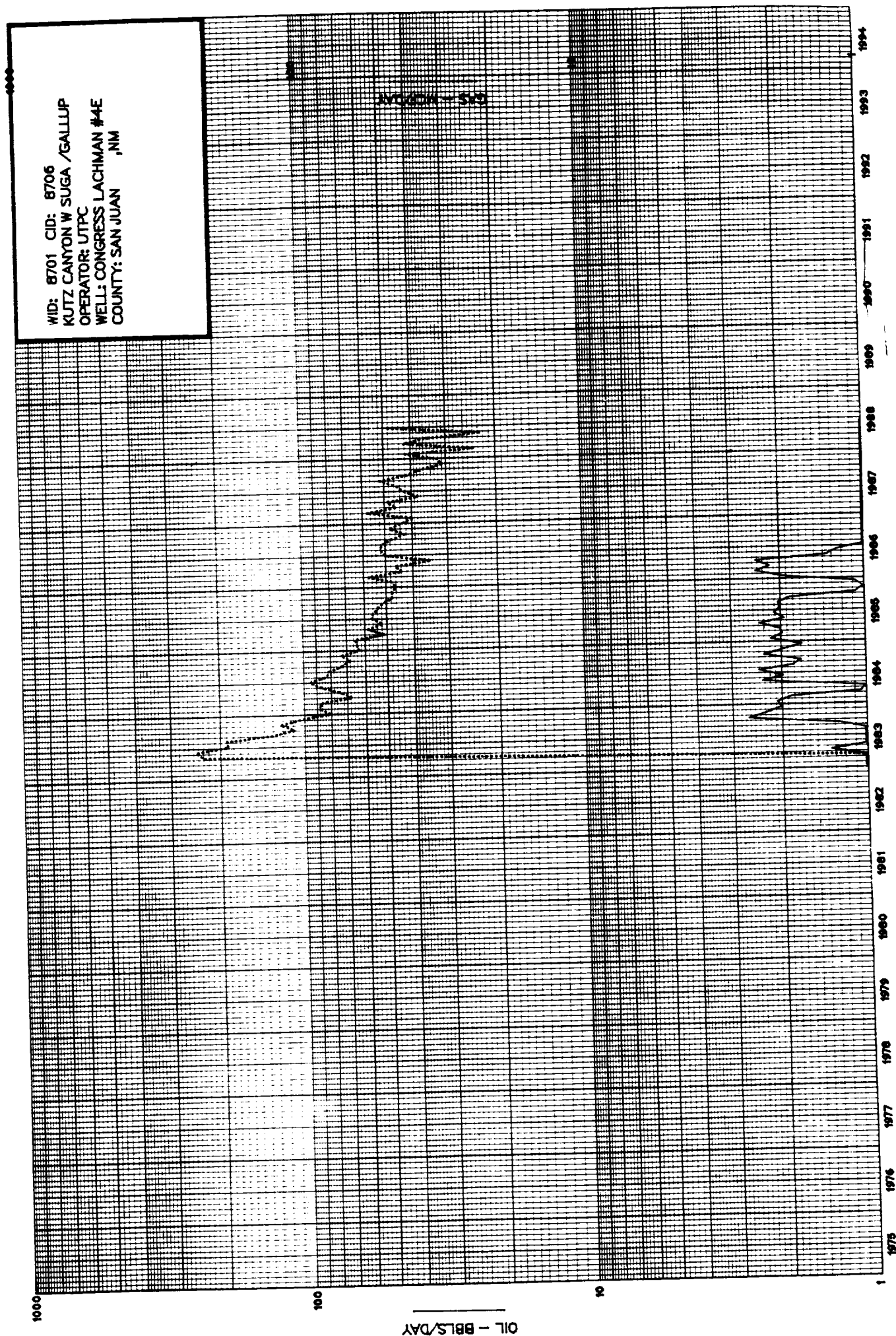
UNION TEXAS PET. ACREAGE
 SUBJECT WELL

WID: 8701 CID: 8702
KUTZ CANYON W SUGA /DAKOTA
OPERATOR: UTPC
WELL: CONGRESS LACHMAN #4E
COUNTY: SAN JUAN ,NM

ASO/ON - SYB



WID: 8701 CID: 8706
KUTZ CANYON W SUGA /GALLUP
OPERATOR: UTPC
WELL: CONGRESS LACHMAN #4E
COUNTY: SAN JUAN ,NM





Union Texas Petroleum

SUBJECT: CONGRESS LACHMAN # 4E

WELLBORE DIAGRAM - COMMINGLED

BY: SGK DATE: 8-19-88

PAGE _____ OF _____

1 7/2" hole
13 7/8", 48#, H-40 @ 330'
circ cmt to surface

940' FNL & 1020' FNL
Section 1B, T2BN-R10W
San Juan County, NM

5799' RKB
5786' GLE
13' KB

DV tool @ 2038'

CHACRA TUBING
2 3/8", 4.7#, J-55, 8rd, EVE @ 2980'

DAKOTA/GALLUP TUBING
2 3/8", 4.7#, J-55, 8rd, EVE @ 6349'

CHACRA 2866'-2982'

7" Packer @ 5400'

12 1/4" hole
9 5/8", 40#, K-55 } @ 5348'
9 5/8", 36#, K-55 }

1st stage, above DV tool by
calculation
2nd stage, circ cmt to surface

GALLUP 5430'-6028'

8 1/2" hole
7", 23#, K-55, 5124'-6580'
cmt to intermediate, by
calculation and CBL.

DAKOTA 6294'-6403'

TD: 6580
PRD: 6482

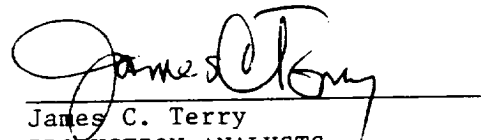
UNION TEXAS PETROLEUM
ANGEL PEAK B24E
LEASE FLUIDS

LABORATORY INVESTIGATION
OF
ANGEL PEAK GALLUP AND DAKOTA FLUIDS COMPATABILITY
JANUARY 22, 1986

PREPARED FOR:

UNION TEXAS PETROLEUM
Sterg Katirgis
Petroleum Engineer


PREPARED BY:


James C. Terry
PRODUCTION ANALYSTS

LABORATORY INVESTIGATION
ANGEL PEAK B24E
LEASE FLUIDS

SUMMARY OF RESULTS

1. No precipitation of materials was observed from either admixture of fluids.
2. Emulsion testing was performed. There is no concern over emulsion effects.
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.



JAMES C. TERRY
PRODUCTION ANALYSTS
Farmington, New Mexico

LABORATORY INVESTIGATION
ANGEL PEAK B24E
LEASE FLUIDS

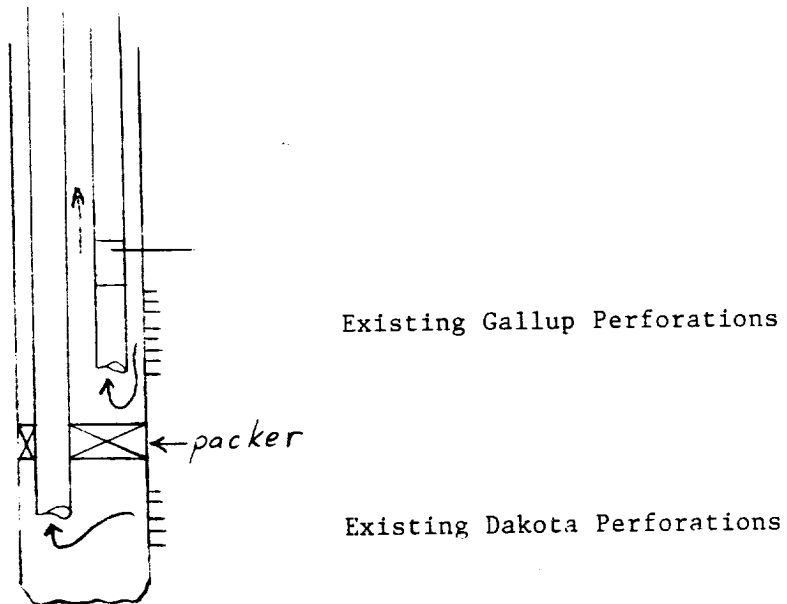
On Monday, January 13, 1986, a request for laboratory work was place by Sterg Katirgis, Petroleum Engineer of Union Texas Petroleum Corporation.

PURPOSE

Two oil samples were received of Mr. Katirgis with the request we investigate the concern of potentially detrimental effects due to comingling of Gallup and Dakota fluids in the Angel Peak B24E.

INVESTIGATION

1. Background Information- *current wellbore*
 - a)



- b) BHST Gradient: 1.375° F/100 ft. depth.
 - c) Current production problems are primarily due to paraffin deposition from surface down to \approx 1000' depth.

LABORATORY INVESTIGATION
ANGEL PEAK B24E
LEASE FLUIDS

d) Commingling Order Mixture Requirements:

The commingling requests present the mixing of Angel Peak B24E Dakota oil with Angel Peak B24E Gallup fluids (oil/water).

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 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.

LABORATORY INVESTIGATION
ANGEL PEAK B24E
LEASE FLUIDS

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 S & W
- b) Discussion with Mr. Katirgis 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.

LABORATORY INVESTIGATION
ANGEL PEAK B24E
LEASE FLUIDS

DATA

Sample #1

Zone:	Dakota
API Gravity @ 60°F	53.0
Cloud Point	22°F
Pour Point	-1°F
Paraffin Content	7.98% (weight)

Sample #2

Zone:	Gallup
API Gravity @ 60°F	44.1
Cloud Point	2°F
Pour Point	< -12°F
Paraffin Content	14.19% (weight)

Sample #3

Zone:	50/50 Mix
API Gravity @ 60° F	48.9
Cloud Point	24°F
Pour Point	< -10°F
Paraffin Content	11.89% (weight)

Analysis No. 1

Date 1-22-86

PRODUCTION ANALYSTS

Oil Analysis

Operator Union Texas Petroleum

Date Sampled 1-10-86

Well Angel Peak B24E

Date Received 1-13-86

Field -

Submitted By Sterg Katirgis

Formation Dakota

Worked By Clay Terry

Depth -

Sample Description Brownish, clear oil

County San Juan

sample. No water phase or emulsion.

State New Mexico

Small bottom solids component.

API Gravity 53.0 ° at 60°F

SAMPLE COMPOSITION:

Paraffin Content 7.98 % by weight

H₂O 0

Asphaltene Content n/a % by weight

Emulsion 0

Pour Point -1 °F

Oil 780

Cloud Point 22 °F

Total 780 ml

Comments:

B S & W Test Results:

Oil 99.9
Water 0
Solids <0.1
Emulsion 0

Analyst

Clay Terry

Analysis No. 2

Date 1-22-86

PRODUCTION ANALYSTS

Oil Analysis

Operator Union Texas Petroleum

Date Sampled 1-10-86

Well Angel Peak B24E

Date Received 1-13-86

Field -

Submitted By Sterg Katirgis

Formation Gallup

Worked By Clay Terry

Depth -

Sample Description Oil/Water/Emulsion sample.

County San Juan

Oil phase is yellowish-brown, opaque.

State New Mexico

Emulsion phase not serious.

API Gravity 44.1 ° at 60°F

Sample Composition:

Paraffin Content 14.19 % by weight

H₂O 103

Asphaltene Content N/A % by weight

Emulsion 16

Pour Point <-12 °F

Oil 807

Cloud Point 2 °F

Total 926ml

Comments:

B S & W Test Results:

Oil	95.5%
Water	0.8%
Solids	<0.1%
Emulsion	3.7%

Analyst Clay Terry

Analysis No. 3

Date 1-22-86

PRODUCTION ANALYSTS

Oil Analysis

Operator Union Texas Petroleum

Date Sampled 1-10-86

Well Angel Peak B24E

Date Received 1-13-86

Field -

Submitted By Sterg Katirgis

Formation Gallup/Dakota

Worked By Clay Terry

Depth -

Sample Description 50/50 mix of oils from

County San Juan

Gallup and Dakota intervals.

State New Mexico

API Gravity 48.9 ° at 60°F

Paraffin Content 11.89 % by weight

Asphaltene Content n/a % by weight

Pour Point <-10 °F

Cloud Point 24 °F

Comments:

B S & W Test Results:

Oil	96.0%
Water	0.4%
Solids	<0.1%
Emulsion	3.6%

Analyst

Clay Terry

API WATER ANALYSIS REPORT FORM

Company Union Texas Petroleum		Sample No. 2B		Date Sampled 1-10-86	
Field Angel Peak Gal/Dak		Legal Description -		County or Parish San Juan	
State NM		Lease or Unit Angel Peak B		Well 24E	
Depth -		Formation Gallup		Water, B/D H ₂ O	
Type of Water (Produced, Supply, etc.) Produced		Sampling Point Separator		Sampled By SK	

DISSOLVED SOLIDS

CATIONS	mg/l	me/l
Sodium, Na (calc.)	218	9.5
Calcium, Ca	-0-	-0-
Magnesium, Mg	29	2.4
Barium, Ba		
Potassium, K	180	4.6

ANIONS

Chloride, Cl	383	10.8
Sulfate, SO ₄	25	0.5
Carbonate, CO ₃	-0-	-0-
Bicarbonate, HCO ₃	319	5.2
Hydroxide, OH	-0-	-0-

Total Dissolved Solids (calc.)

1154

Iron, Fe (total)

-0-

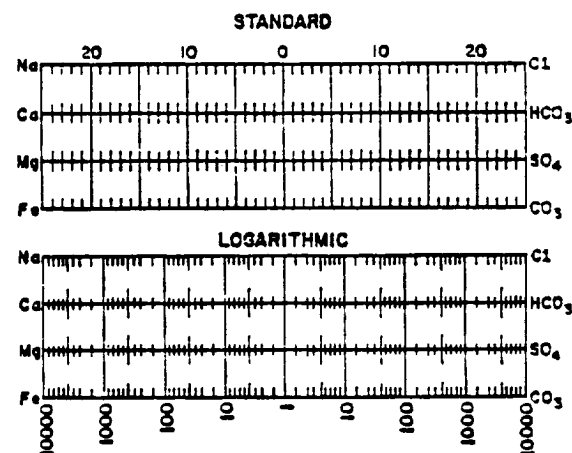
Sulfide, as H₂S

-0-

OTHER PROPERTIES

pH	6.3
Specific Gravity, 60/60 F.	1.003
Resistivity (ohm-meters) 75 F.	∞
Total Hardness	120

WATER PATTERNS — me/l



REMARKS & RECOMMENDATIONS:

DATE:

Fig. 1
EMULSION TESTS DATA SHEET

OPERATOR: UNION TEXAS SUBMITTED BY: S. KATIRGIS TYPE & CONC. OF FLUID: 50/50 MIX OF
 WELL: ANGEL PEAK B24E SOURCE OF SAMPLE: GALLUP/DAKOTA FLUIDS
 FIELD: Angel Peak Gal/B DATE SAMPLED: 1-10-86 TYPE & CONC. OF SOLIDS:
 FORMATION: Gallup/Dakota DATE RECEIVED: 1-13-86 TEST TEMPERATURE: 75°F
 DEPTH: Unknown API GRAVITY OF OIL: 48.9 FLUID RATIO: 50/50
 COUNTY: San Juan ANALYSIS BY: C. Terry

PERCENTAGE OF ORIGINAL H₂O SEPARATED AT VARIOUS TIME INTERVALS AFTER EMULSIFYING

Test Number	1															
Elapsed Time	Time	Vol	Time	Vol	Time	Vol	Time	Vpl	Time	Vol	Time	Vol	Time	Vol	Time	Vol
1 min	1	4	2		3		4		5		6		7		8	
2	2	6	3		4		5		6		7		8		9	
3	3	7	4		5		6		7		8		9		10	
4	4	7	5		6		7		8		9		10		11	
5	5	7	6		7		8		9		10		11		12	
6	6	7	7		8		9		10		11		12		13	
7	7	7	8		9		10		11		12		13		14	
8	8	7	9		10		11		12		13		14		15	
9	9	7	10		11		12		13		14		15		16	
10	10	7	11		12		13		14		15		16		17	
20	20	7	21		22		23		24		25		26		27	
30	30	7	31		32		33		34		35		36		37	
Total Vol (ml)		100														
Vol Emulsion / Sludge		0														
Solids*																
Interface**																
OIL		93														

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

**The mixture of fluids was constructed to reflect proper proportions of the various fluids within each sample. Therefore, the mix was 50 ml Dakota oil, 43 ml Gallup oil, 6 ml Gallup H₂O, 1 ml Gallup Emulsion

LABORATORY INVESTIGATION
ANGEL PEAK B24E
LEASE FLUIDS

CALCULATIONS

Cool down effects due to gas expansion:

Reference: Perry's Handbook of Chemical Engineering

RE: Adiabatic Expansion of Ethane, Methane

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

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° F

P_s = 500 psi

P_r = 2000 psi

K = 1.2

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

$T_s = 127° \text{ F}$

NOTE:

A total cooldown of 33°F would be expected



Union Texas Petroleum

375 U.S. Highway 64
Farmington, New Mexico 87401
Telephone (505) 325-3587

August 22, 1988

Operations Manager
Danson Oil Corporation
P. O. Box 4391
Houston, TX 77210

Gentlemen:

Union Texas Petroleum Corporation is in the process of applying for a downhole commingling order for our Congress Lachman #4E well located 940' FNL & 1820' FWL in Section 18, Township 28N-Range 10W, San Juan County, New Mexico in the Armenta Gallup and Basin Dakota.

This is to notify you of such action as our records indicate that you are owner and operator of acreage which adjoins the area in which the downhole commingling is requested. If you have no objection to the proposed downhole commingling order, we would appreciate your signing the attached copy of this letter and returning it to this office.

Your prompt attention to this matter would be appreciated.

Very truly yours,

S. G. Katirgis

S. G. Katirgis
Production Engineer

SGK:lmj

The above downhole commingling request is hereby approved:

Date



Union Texas Petroleum

2750 S. Highway 64
Farmingington, New Mexico 87401
Telephone (505) 325-3587

August 22, 1988

Operations Manager
Mesa Limited Partnership
P. O. Box 579
Flora Vista, NM 87415

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Your prompt attention to this matter would be appreciated.

Very truly yours,

S. G. Katirgis

S. G. Katirgis
Production Engineer

SGK:lmg

The above downhole commingling request is hereby approved:

Date



Union Texas Petroleum

375 U.S. Highway 64
Farmington, New Mexico 87401
Telephone (505) 325-3587

August 22, 1988

Operations Manager
Amoco Production Co.
2325 East 30th Street
Farmington, NM 87401

Gentlemen:

Union Texas Petroleum Corporation is in the process of applying for a downhole commingling order for our Congress Lachman #4E well located 940' FNL & 1820' FWL in Section 18, Township 28N-Range 10W, San Juan County, New Mexico in the Armenta Gallup and Basin Dakota.

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S. G. Katirgis
Production Engineer

SGK:lmg

The above downhole commingling request is hereby approved:

Date



Union Texas Petroleum

375 U.S. Highway 64
Farmington, New Mexico 87401
Telephone (505) 325-3587

August 22, 1988

Operations Manager
Texaco, Inc.
P. O. Box 2100
Denver, CO 80201

Gentlemen:

Union Texas Petroleum Corporation is in the process of applying for a downhole commingling order for our Congress Lachman #4E well located 940' FNL & 1820' FWL in Section 18, Township 28N-Range 10W, San Juan County, New Mexico in the Armenta Gallup and Basin Dakota.

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S. G. Katirgis
Production Engineer

SGK:lmg

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Date



Union Texas Petroleum

375 U.S. Highway, 64
Farmington, New Mexico 87401
Telephone (505) 325-3587

August 22, 1988

Operations Manager
Meridian Oil, Inc.
3535 East 30th Street
Farmington, NM 87401

Gentlemen:

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S. G. Katirgis
Production Engineer

SGK:lmg

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Date



Union Texas Petroleum

375 U.S. Highway 64
Farmington, New Mexico 87401
Telephone 505/325-3587

August 22, 1988

Operations Manager
Crown Central Petroleum Corp.
4747 Bellaire Boulevard
Bellaire, TX 77401

Gentlemen:

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S. G. Katirgis
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Date