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**MERIDIAN OIL**

June 10, 1992

New Mexico Oil Conservation Division  
Attn: Mr. Bill LeMay  
P.O. Box 2088  
310 Old Santa Fe Trail  
Santa Fe, New Mexico 87501

RE: Hanks #23  
Unit D, Section 7, T27N, R09W  
San Juan County, New Mexico  
Downhole Commingling Request

Dear Mr. LeMay:

Meridian Oil Inc. is applying for an administrative downhole commingling order for the referenced well in the Fulcher Kutz Pictured Cliffs and the Basin Fruitland Coal fields. The ownership of the zones to be commingled is common. The offset operators to this well are Amoco Production Company, Conoco, Inc., Dugan Production and McKenzie Methane. The Bureau of Land Management and the above mentioned operators will receive notification of this downhole commingling.

The subject well was completed in the Fulcher Kutz Pictured Cliffs interval in July 1969. Gas sales commenced in August 1969 with a cumulative to date production of 299 MMCF. This well has been inactive for five years and is currently blind plated.

The Fruitland Coal is proven to be productive in this area by Meridian and other operators producing wells. Based on offset production in this area, new well drilling is not economically justified. The only economical way to recover the Fruitland Coal reserves in this area is to commingle the production with an existing well.

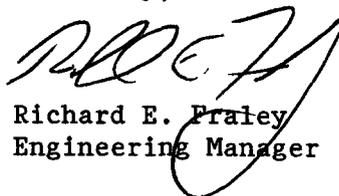
It is proposed to set a bridge plug above the Pictured Cliffs, perforate and stimulate the Fruitland Coal, then remove the bridge plug and produce both zones through a single string of tubing. The reservoir characteristics of each of the subject zones are such that underground waste will not be caused by the proposed commingling. Neither producing interval makes oil or water in the offset wells. The shut-in pressure for the Pictured Cliffs and Fruitland Coal is 270 and 350 psi, respectively.

New Mexico Oil Conservation Division  
Mr. Bill LeMay  
Hanks #23  
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Page Two

The allocation of the commingled production will be calculated using the attached allocation formula. This formula is based on the Pictured Cliffs production history for the last 19 years and uses accepted Reservoir Engineering methods to allocate the remaining Pictured Cliffs reserves. All additional reserves will be attributed to the Fruitland Coal reservoir. This addresses the Fruitland Coal producing characteristics of early life inclining production rates. The formula also addresses the possible situation of pipeline curtailment.

Approval of this commingling application will allow for the prevention of wasted resources and protection of correlative rights. Included with this letter are plats showing ownership of offsetting leases for both the Pictured Cliffs and Fruitland Coal, a copy of letters to the BLM and offset operators, wellbore diagrams, production history curves, pertinent data sheet, and an allocation formula.

Sincerely,



Richard E. Fraley  
Engineering Manager

KAS:tg  
attachments

cc: Frank Chavez - NMOCD/Aztec

Pertinent Data Sheet - Hanks #23 FTC/PC

Location: 800' FNL, 1120' FWL, Section 7, T27N R9W, San Juan County, N.M.

Field: Basin Fruitland Coal  
Futcher Kutz Pictured Cliffs

Elevation: 6554' GL

TD: 2632'  
PBTD: 2604

GWI: 25.000%  
NRI: 21.125%

Completed: 7-25-69

DP Number: 27197 PC  
27197B FTC

Initial Potential:  
PC: 1,622 MCF/D - Pitot

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>
12-1/4"	8-5/8"	24 # NA	111'	60 sxs	SURF (CIRC)
6-3/4"	4-1/2"	9.5 # NA	2604'	250 sxs	1500' (CBL)

Tubing Record:

1" NA 2520'

Formation Tops:

Ojo Alamo: 1547'  
Kirtland: 1674'  
Fruitland: 2299'  
Pictured Cliffs: 2498'

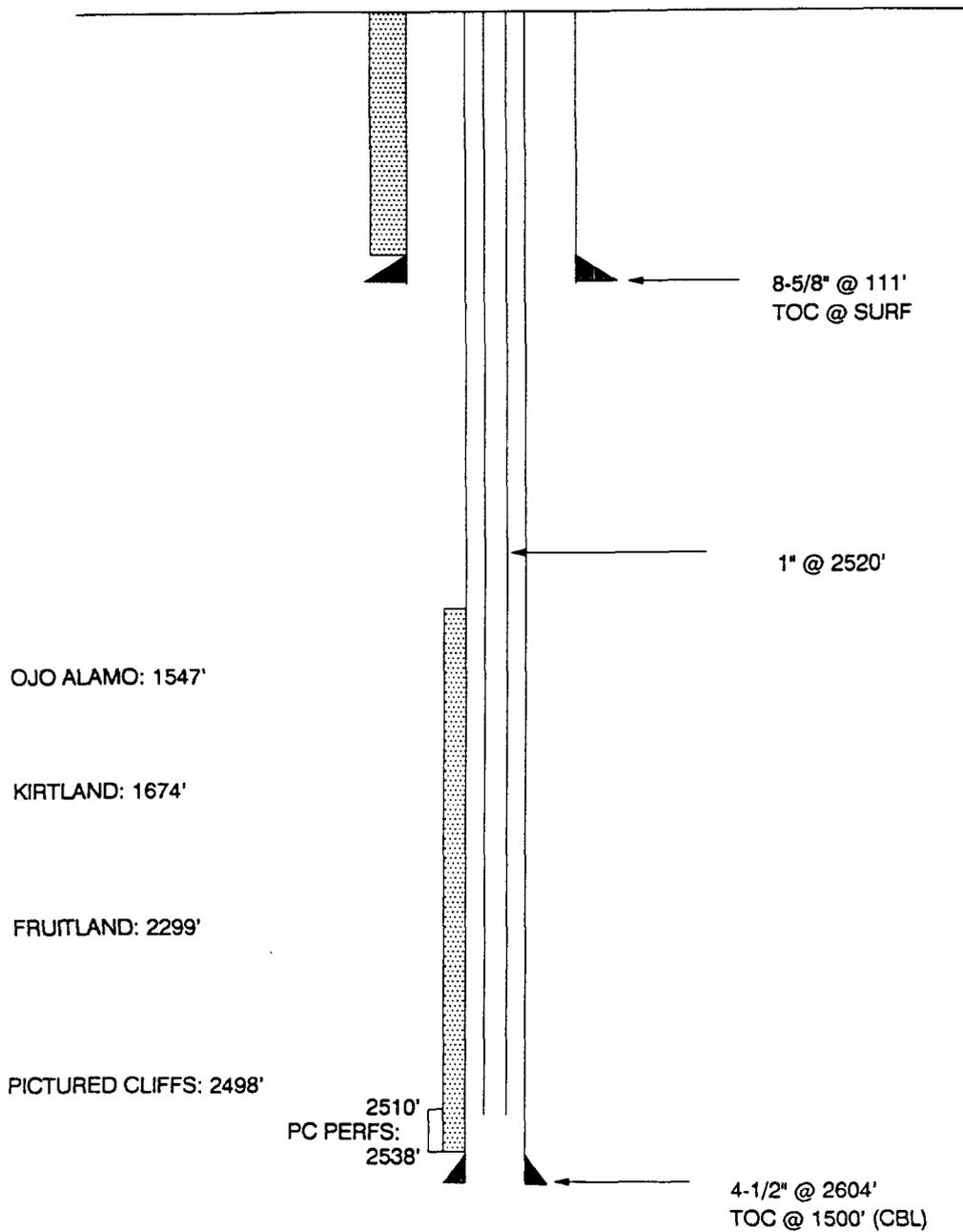
Logging Record: ES-INDUCTION, CBL.

Stimulation: Perferated from 2510-18', 2523-28' and 2532-38' with 4 SPF. Fraced with 25,000 lbs sand. Injection rate 43 BPM. Max treating pressure 1900 psi.

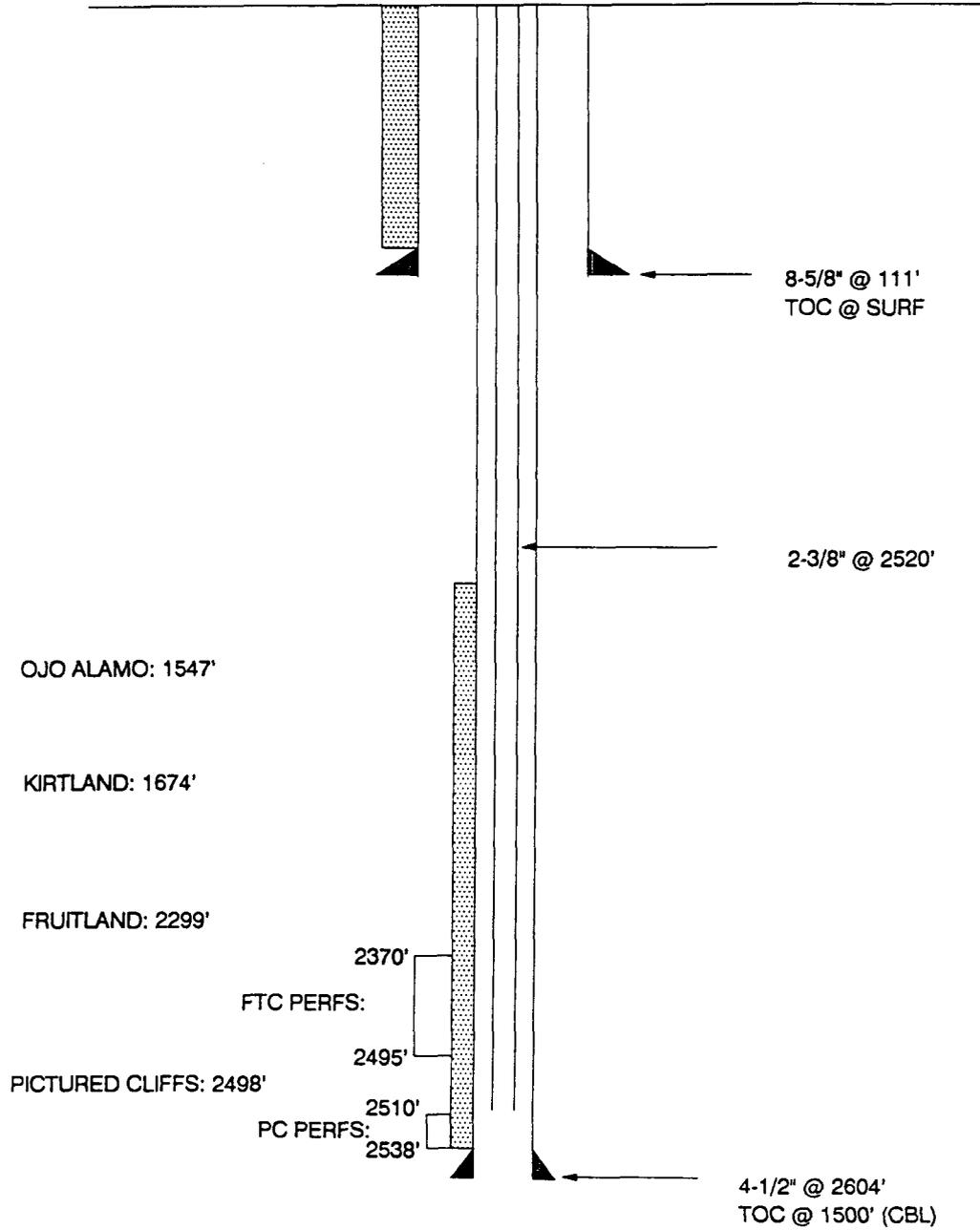
Workover History: None.

Production History: PC cum = 299 MMCF since 1st delivery in August of 1969. Well has been inactive since 1987 and is currently SIBP.

CURRENT  
**HANKS #23**  
UNIT D SECTION 7 T27N R9W  
SAN JUAN COUNTY, NEW MEXICO



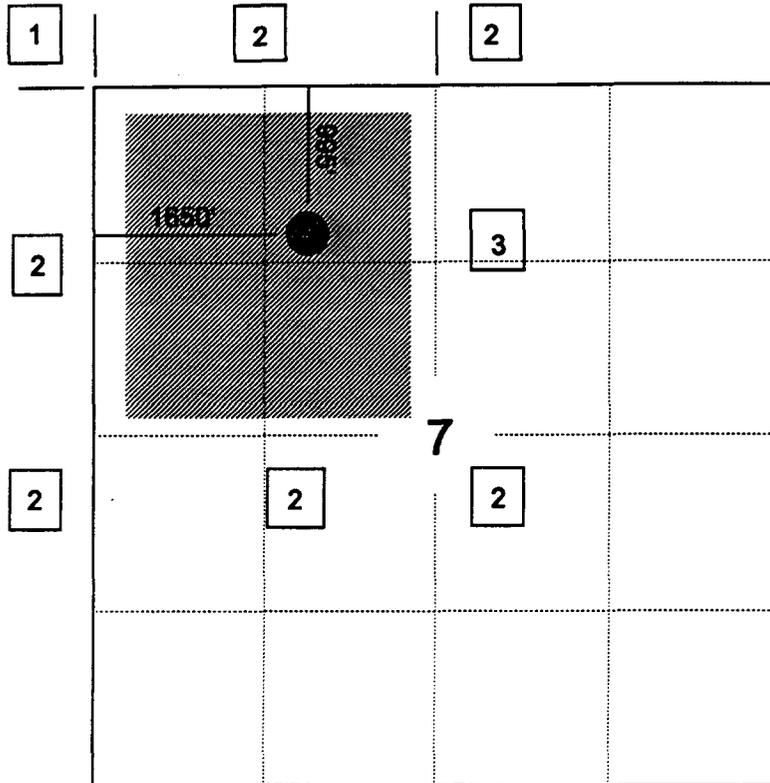
PROPOSED  
**HANKS #23**  
UNIT D SECTION 7 T27N R9W  
SAN JUAN COUNTY, NEW MEXICO



**MERIDIAN OIL INC  
OFFSET OPERATOR PLAT  
HANKS #23**

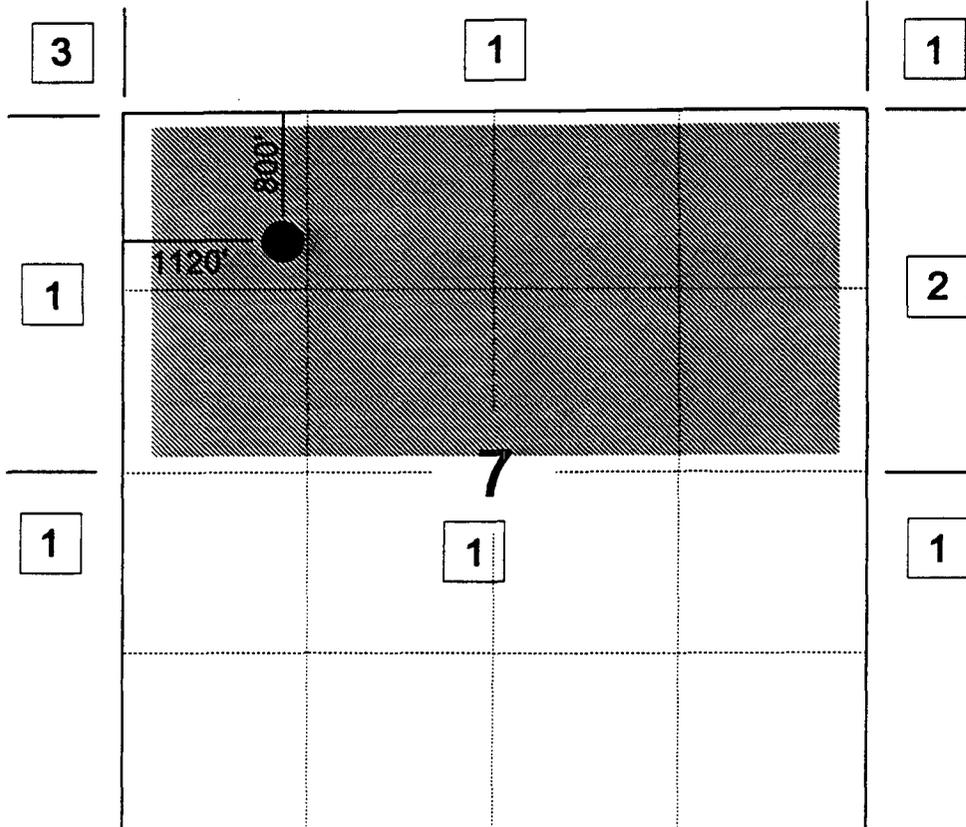
Fruitland Coal \ Pictured Cliffs Comingle

Township 27 North, Range 09 West



- 1) Meridian Oil Inc \_\_\_\_\_
- 2) Southland Royalty Company \_\_\_\_\_
- 3) Southland Royalty Company \_\_\_\_\_
- Dugan Production Corp., PO Box 208, Farmington, NM 87499 \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**MERIDIAN OIL INC**  
**OFFSET OPERATOR \ OWNER PLAT**  
**HANKS #23**  
**Fruitland Coal \ Pictured Cliffs Commingle**  
 Township 27 North, Range 09 West



- 1) Soluthland Royalty Company
- 2) Southland Royalty Company  
Dugan Production Corp., PO Box 208, Farmington, NM 87499
- 3) McKenzie Methane, 7880 San Felipe, Houston, TX 77063  
Amoco Production Company, PO Box 800, Denver CO 80202  
Conoco, Inc., PO Box 951063, Houston, TX 75395-1063

**Fruitland Coal Formation**

FIGURE 1

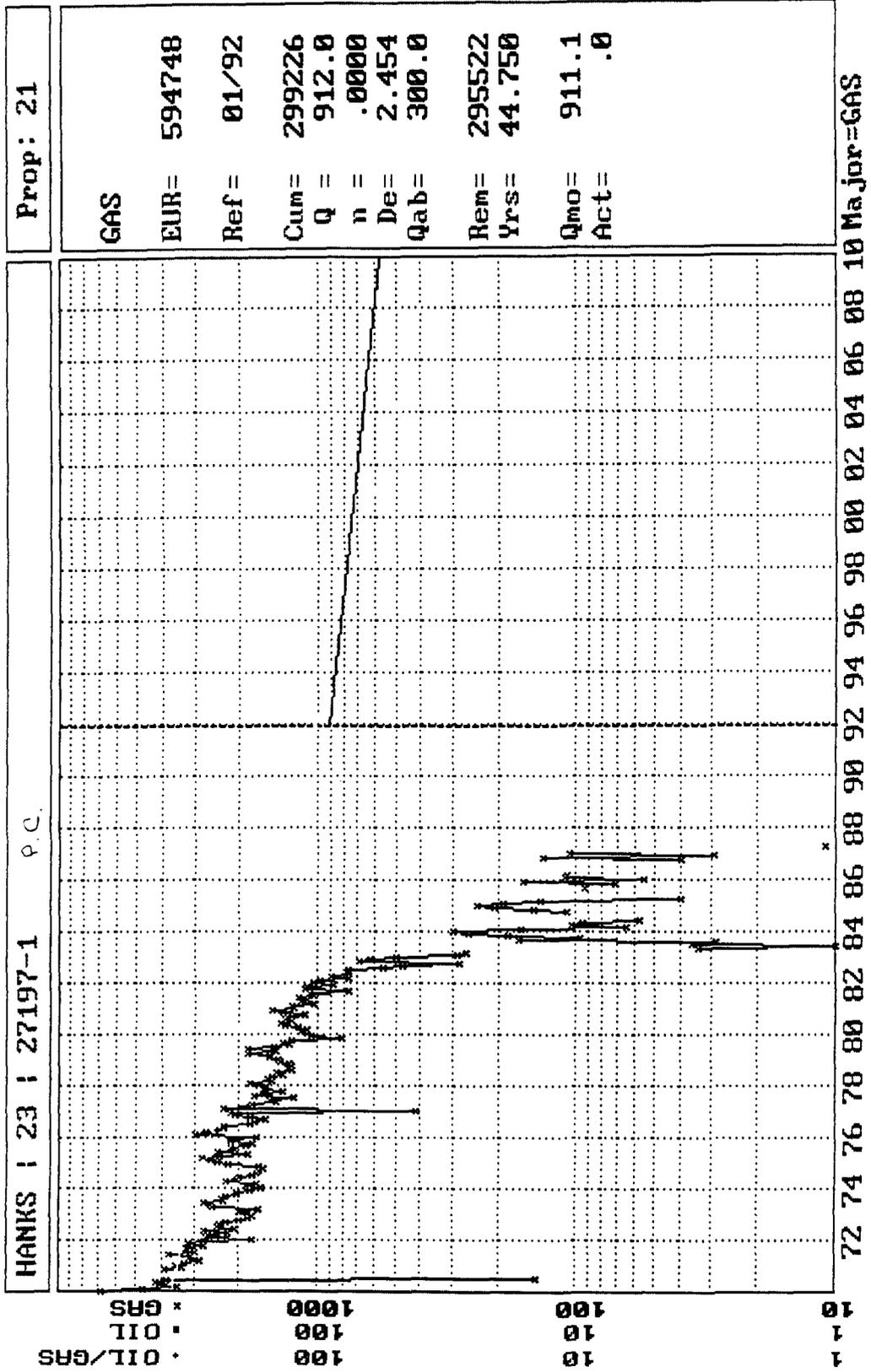
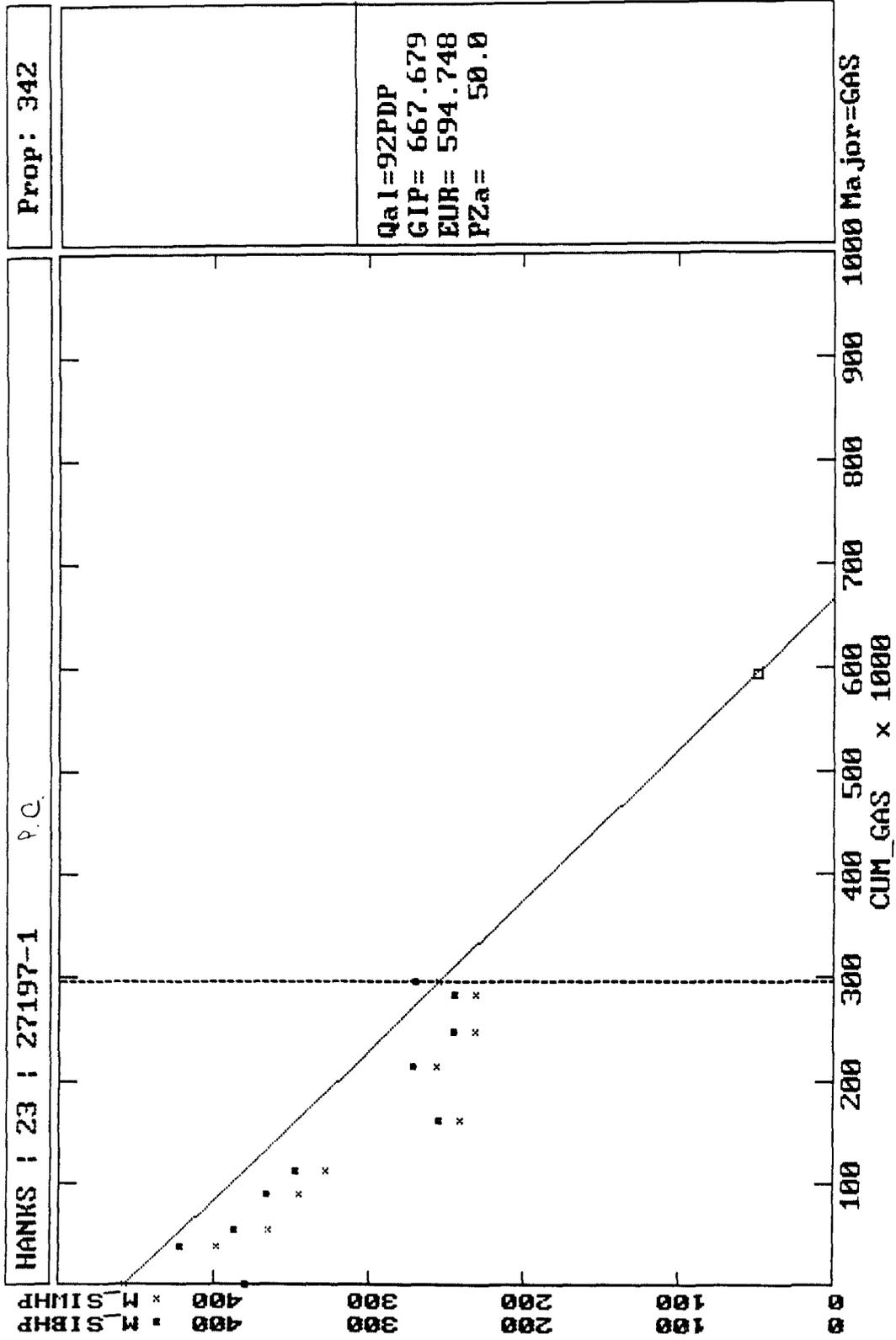


FIGURE 2



## Hanks #23 Allocation Formula

### Equation Derivation

Given the exponential decline curve analysis formula\*:

$$De = 1 - (Q_2/Q_1)^{(1/Yr)}$$

Where: De = Effective Decline in %/yr  
Q<sub>2</sub> = Rate two (at some future date) MCFD  
Q<sub>3</sub> = Rate one (current rate) MCFD

Rearranging the equation to solve for Q<sub>2</sub>:

$$Q_2 = Q_1(1-De)^{Yr} \text{ MCFD}$$

### Hanks #23 Formula

Using Production plot (Fig 1):

Last production rate = Q<sub>1</sub> = 912 MCFM  $\cong$  30 MCFD  
De = 2.454% from plot

$$Q_{2PC} = 30 (1 - 0.02454)^{Yr} \text{ MCFD}$$

$$Q_{2PC} = 30 (0.97546)^{Yr} \text{ MCFD} \quad \text{FORMULA FOR FUTURE PC RATES}$$

Any production rate over what is calculated using the above PC formula on a specific date is Fruitland Coal.

### Curtailment Situations

If any curtailment occurs, both streams will be affected the same and go to 0 MCFD.

When production resumes, the rates will equate to those when the well was shut in:

$$Q_{2PC} = 30 (0.97546)^{(Yr - \text{curtailment time})}$$

$$Q_{FTC} = Q_{TOT} - Q_{PC}$$

$$Q_{TOT} = Q_{FTC} + Q_{PC}$$

The total amount of PC gas produced will be the EUR calculated through decline curve and P-Sum analysis (see Figs 1 & 2).

\*Reference: pg. 5-46 Oil Property Evaluation  
by R. S. Thompson & J. D. Wright

Hanks #23 Allocation Formula, page 2

Example:                    Date Now = 1/1/93

Assuming the well produces steadily in 1993. On 1/1/94, the well produces 300 MCFD.

$$Q_1 = 30 \text{ MCFD}$$

$$De = 2.454\%$$

$$Q_{PC} = 30 (0.97546)^{(\text{Yr} - \text{curtailment time})}$$

$$Q_{PC} = 30 (0.97546)^{(1 - 0)} = 29 \text{ MCFD}$$

$$Q_{TOT} = 300 \text{ MCFD} = Q_{FTC} + Q_{PC}$$

$$Q_{FTC} = 300 - 29 = 271 \text{ MCFD}$$

Then on 1/2/94, the well gets shut in for 1 month:

On 2/2/94, assume that the PC stream will come back on line at the same rate it left off. Or:

$$1 \text{ month curtailment} = 1/12 = 0.0833$$

$$\text{Tot. Time} = 1 \text{ yr} + 1 \text{ month} = 1 + 1/12 = 1.0833$$

$$Q_{PC} = 30 (0.97546)^{(1.0833 - 0.0833)} = 29 \text{ MCFD.}$$

$$Q_{TOT} = 300 \text{ MCFD}$$

$$Q_{FTC} = 271 \text{ MCFD}$$

# MERIDIAN OIL

June 10, 1992

Bureau of Land Management  
1235 La Plata Highway  
Farmington, New Mexico 87401

RE: Hanks #23  
Unit D, Section 7, T27N, R09W  
San Juan County, New Mexico  
Downhole Commingling Request

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for the Hanks #23 well located in Unit D, Section 7, T27N, R09W, N.M.P.M., San Juan County, New Mexico, in the Fulcher Kutz Pictured Cliffs and Basin Fruitland Coal fields.

The purpose of this letter is to notify you of such action. If you have no objections to the proposed 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.

Yours truly,

  
Keith A. Swainson  
Production Engineer

KAS:tg

The above downhole commingling request is hereby approved:

\_\_\_\_\_  
Date: \_\_\_\_\_

# MERIDIAN OIL

June 10, 1992

Dugan Production Company  
P.O. Box 208  
Farmington, New Mexico 87499

RE: Hanks #23  
Unit D, Section 7, T27N, R09W  
San Juan County, New Mexico  
Downhole Commingling Request

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Keith A. Swainson  
Production Engineer

KAS:tg

The above downhole commingling request is hereby approved:

\_\_\_\_\_  
Date: \_\_\_\_\_

# MERIDIAN OIL

June 10, 1992

McKenzie Methane  
7880 San Felipe  
Houston, Texas 77063

RE: Hanks #23  
Unit D, Section 7, T27N, R09W  
San Juan County, New Mexico  
Downhole Commingling Request

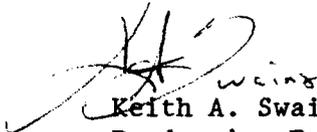
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Keith A. Swainson  
Production Engineer

KAS:tg

The above downhole commingling request is hereby approved:

\_\_\_\_\_  
Date: \_\_\_\_\_

# MERIDIAN OIL

June 10, 1992

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

RE: Hanks #23  
Unit D, Section 7, T27N, R09W  
San Juan County, New Mexico  
Downhole Commingling Request

Gentlemen:

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Keith A. Swainson  
Production Engineer

KAS:tg

The above downhole commingling request is hereby approved:

\_\_\_\_\_  
Date: \_\_\_\_\_

# MERIDIAN OIL

June 10, 1992

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

RE: Hanks #23  
Unit D, Section 7, T27N, R09W  
San Juan County, New Mexico  
Downhole Commingling Request

Gentlemen:

Meridian Oil, Inc. is in the process of applying for a downhole commingling order for the Hanks #23 well located in Unit D, Section 7, T27N, R09W, N.M.P.M., San Juan County, New Mexico, in the Fulcher Kutz Pictured Cliffs and Basin Fruitland Coal fields.

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Production Engineer

KAS:tg

The above downhole commingling request is hereby approved:

\_\_\_\_\_  
Date: \_\_\_\_\_



RECEIVED  
OIL CONSERVATION DIVISION  
92 JUN 25 AM 9 00

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: June 23, 1992

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

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

Proposed DHC α \_\_\_\_\_  
Proposed SWD \_\_\_\_\_  
Proposed PMX \_\_\_\_\_  
Proposed DD \_\_\_\_\_

Gentlemen:

I have examined the application received on June 11, 1992  
for the Meridian OPERATOR Starker #23 LEASE & WELL NO.

D-7-27N-9W and my recommendations are as follows:  
UL-S-T-R

Approve  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Yours truly,

[Signature]