National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil Division Office

July 29, 1987

New Mexico Oil Conservation Division
Post Office Box 2088
Sante Fe, New Mexico 87504

RE: Commingling Application
Candado No. 21A
Unit P, Sec 4, T26N-R7W
Rio Arriba County, New Mexico

Gentlemen:

National Cooperative Refinery Association requests administrative approval to downhole commingle production from the Blanco Mesaverde and the Otero Chacra in the subject well. The downhole commingling will be achieved by pulling both tubing strings and the packer. A single tubing string will be run to the Mesaverde and both the Chacra and the Mesaverde will produce through tubing.

The downhole commingling of the Candado No. 21A is necessary to improve the producing efficiency, and thereby prevent waste of the Mesaverde gas resources. Currently, the Mesaverde logs off every other day due to liquid loading and must be blown to the atmosphere to re-establish production. By commingling production downhole, the Chacra will provide additional gas production and aid the Mesaverde in unloading liquids from the wellbore. Subsurface and surface equipment installations can also be used to prevent waste if the well continues to log off. Such equipment cannot be used effectively with the current wellbore configuration.

The proposed commingling will not adversely effect either zone for the following reasons:

1. The bottom hole pressure of the Chacra is 80 percent of the Mesaverde bottom hole pressure based on a 5 day shut-in period.

2. Neither zone has a history of sensitivity to condensate or water and should not be damaged by the small amount produced.

3. Both zones produce gas with a similiar BTU content and commingling will not diminish the value of the commingled gas.

4. Both zones have common ownership.

In compliance with New Mexico Oil Conservation Division rule 303C, please find two copies of each of the following attachments:

1. Well location map showing acreage dedicated to well and ownership of offsetting leases.

2. Division Form C-116, 24-hour productivity test.

3. Production curve for the Mesaverde.

4. Production curve for the Chacra.

5. Bottom hole pressure for the Mesaverde.

6. Calculated bottom hole pressure for the Chacra.

7. Water analysis for the Mesaverde.*

8. Gas analysis for the Mesaverde.

9. Gas analysis for the Chacra.

10. Formula for the allocation of production for each commingled zone.

11. A copy of the letter sent to all offset operators notifying them of our intent to commingle.

* The Chacra formation does not produce any liquids in this well.

To allocate production to the individual Mesaverde and Chacra formations we recommend the following:

1. Allocate 70.9 percent gas production to the Mesaverde.

2. Allocate 29.1 percent gas production to the Chacra.

3. Allocate 100 percent condensate production to the Mesaverde.

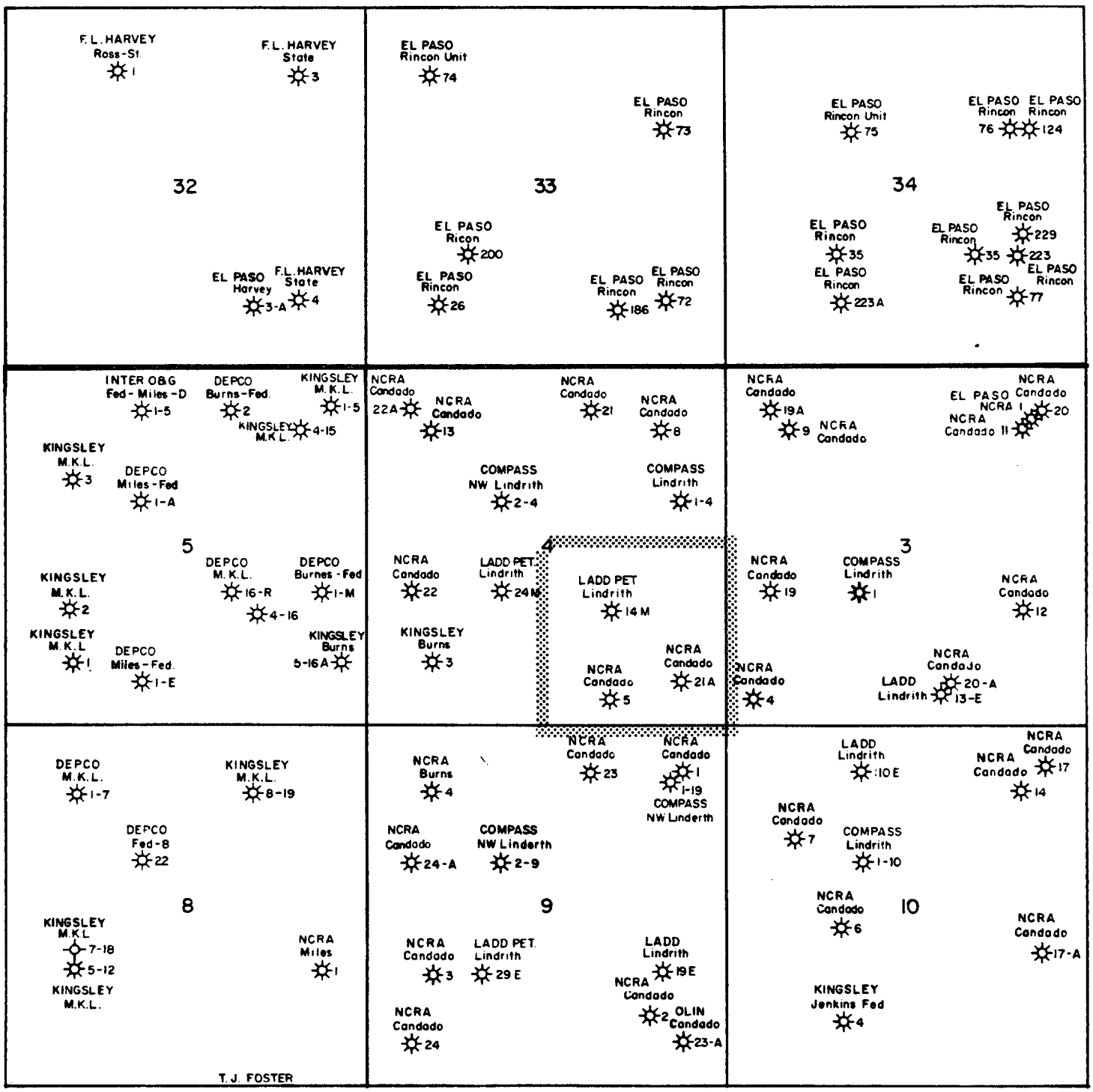
Questions concerning this commingling application should be directed to the undersigned at (303) 861-4883.

Sincerely,

A.M. O'Hare

A.M. O'Hare
Joint Operations Supervisor

MJB/bvl
enc



N.C.R.A.

Acerage Dedication Plat Showing Offset Ownership

Candado No. 21A

Rio Arriba County, New Mexico

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-116
Revised 10-1-78

GAS-OIL RATIO TESTS

Operator: National Cooperative Refinery Asso.
Pool: Blanco Mesaverde/Otero Chacra
County: Rio Arriba
Address: 1775 Sherman Street, Suite 3000 Denver, CO 80203
TYPE OF TEST - (X): Scheduled [ ] Completion [ ] Special [XX]

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOWABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS - OIL RATIO CU.FT/BBL.
Candado No. 21A Mesaverde	21A	P	4	26N	7W	7/14/87	P		352		24	0		0.3	97	323,000
Candado No. 21A Chacra	21A	P	4	26N	7W	7/22/87	P		344		24	0		0	74	

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 Division.

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.

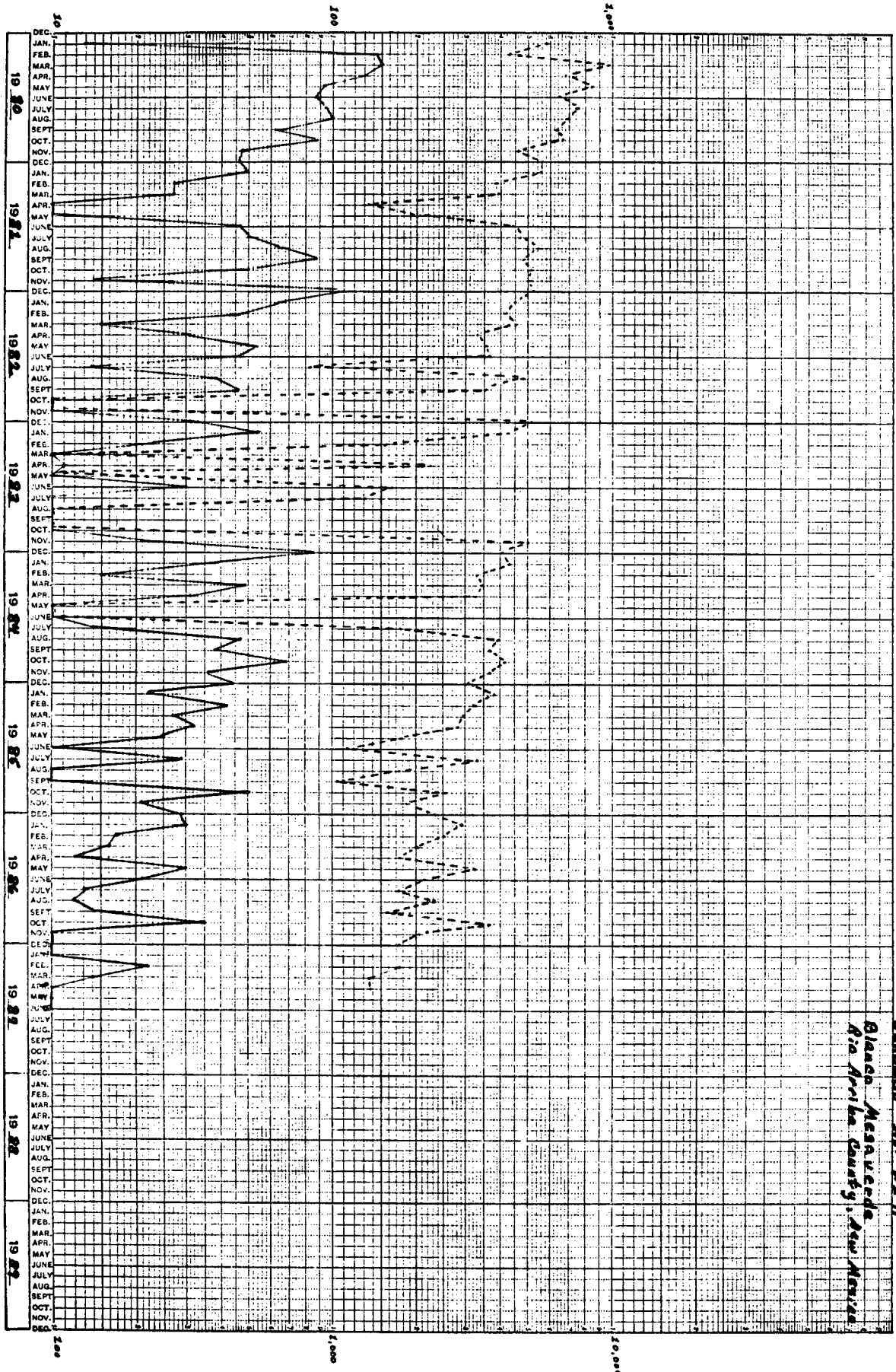
Report casing pressure in lieu of tubing pressure for any well producing through casing.

Mail original and one copy of this report to the district office of the New Mexico Oil Conservation Division in accordance with Rule 301 and appropriate pool rules.

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

A.M. O'Hare
A.M. O'Hare (Signature)
Joint Operations Supervisor
(Title)

Condensate per Month ——



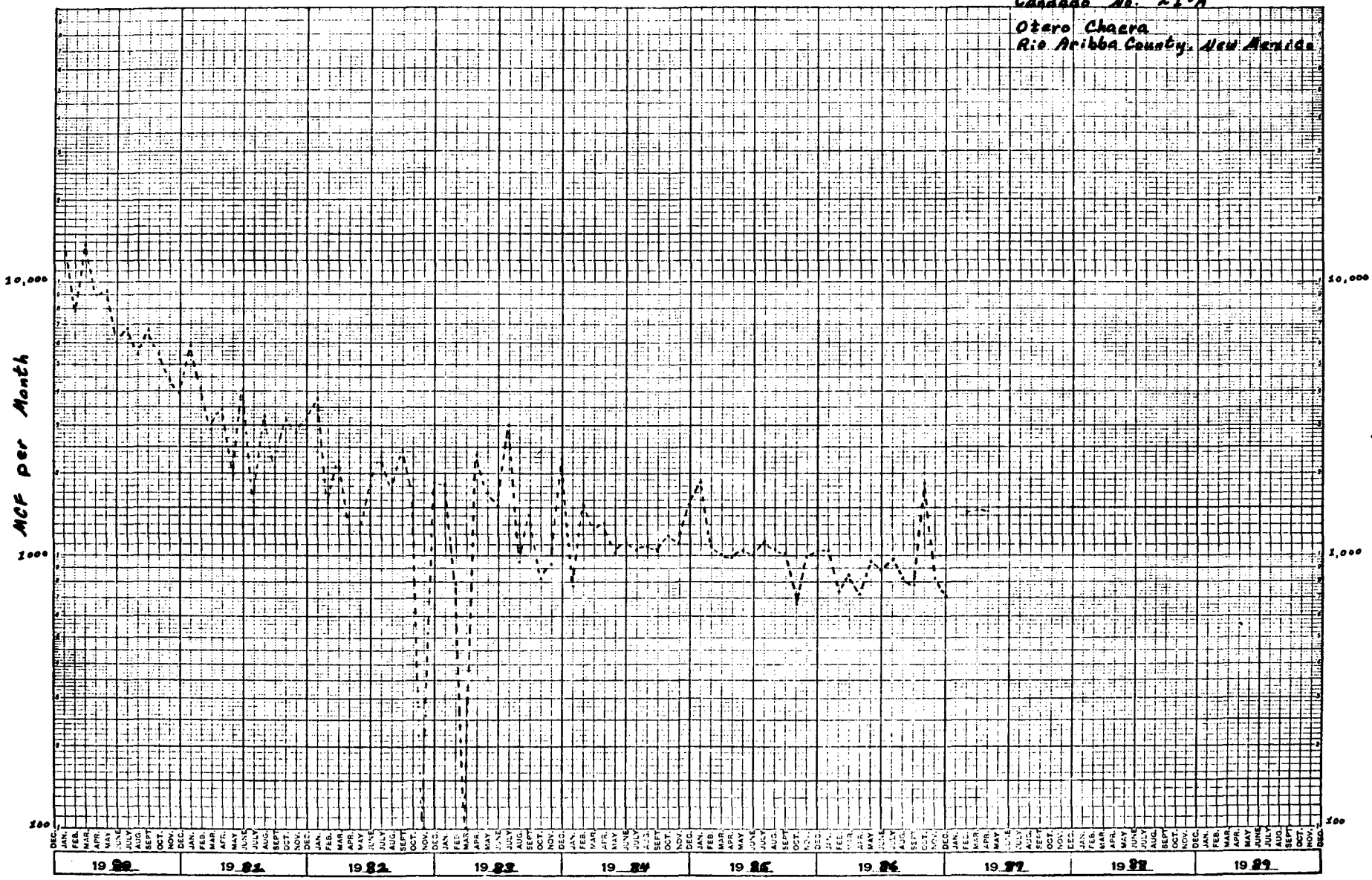
MCF per Month - - - - -

Candado No. 21-A
Blanco Mesaverde
Rio Arriba County, New Mexico

Candado No. 21-A

Otero Chacra

Rio Arriba County, New Mexico



B & R SERVICE, INC.

P. O. Box 1048
Farmington, New Mexico 87499
(505) 325-2393

Company N.C.R.A. Lease CANADO Well #21 A

County RIO ARRIBA State NEW MEXICO Date 6-25-87

Shut-In _____ Zero Point G.L. Tbg. Pressure 424

Casing Pressure _____ Tbg. Depth _____ Casing Perf. _____

Max. Temp. _____ Fluid Level _____

DEPTH	PSIG	GRADIENT
0	424	----
3700	480	.015
4950	603	.098
5050	620	.170

CANDADO NO 21A

CHACRA BHP CALCULATIONS

From Gas Analysis, Apparent Molecular Weight, $M_A = 19.3 \ \frac{1bm}{1b \cdot mol}$

Measured Surface Pressure, Ps = 455 psig = 469 psia

Estimated BHT @ 3700 ft = BHT 110°F = 570°R

Surface Temperature = 60°F = 520°R

$$T = \frac{TBH + Ts}{2} = 545°R$$

Assume BHP = 510° psia, $P = \frac{469 + 510}{2} = 589.5$ psig

$$\rho = \frac{\bar{P} \ M_a}{T \ R} = \frac{489.5 \text{ psia} \times 19.3 \ \frac{1bm}{1b \cdot mol}}{545°R \times 10.73 \ \frac{psia \cdot ft^3}{1b \cdot mol \cdot °R}} = 1.616 \ \frac{1bm}{ft^3}$$

$$BHP = Ps + Depth\ (\rho) = 469 + 3700 \text{ ft } (1.616 \ \frac{1bm}{ft^3} \ \frac{1ft^2}{144in^2}) =$$

BHP = 510.5 psia

BHP = 510.5 ≈ 510 psia

BHP = 510 psia = 496 psig

		Report No:	1
		Date:	3-23-87
Company:	N.C.R.A.	County:	SAN JUAN
Address:		Field:	BLANCO
		Formation:	MESA VERDE
Attention:	MIKE BARNES	Lease:	CANDADO
Date Sampled:	3-22-87	Well:	21A

WATER ANALYSIS

Specific Grav:	1.000	pH:	6.50
Chloride:	900 mg/l	Calcium:	44 mg/l
Bicarbonate:	31 mg/l	Magnesium:	7 mg/l
Sulfate:	0.	Total Iron:	0.
Sulfide:	0.	Sodium:	530 mg/l
Total Hardness (as CaCO3):	140 mg/l	Total Dislvd Solids:	1,512 mg/l
Resistivity:	9.00	Ohm Meters @:	60 F
Potassium:	0.	Carbonate:	N D

Sample Source:

Remarks:

Analyst: M. CONREY
Smith Representative: M. CONREY

06-05-87

EL PASO NATURAL GAS COMPANY
MEASUREMENT DEPARTMENT
POST OFFICE BOX 1492
EL PASO, TEXAS 79978

MAILEE
04920

CHROMATOGRAPHIC GAS ANALYSIS REPORT

NATIONAL CO-OP REFINERY ASSN
1775 SHERMAN ST. SUITE 3000
DENVER, CO 80203

ANAL DATE 00-00-00

METER STATION NAME
CANDADO #21A MV

METER STA 90721
OPER 6311

TYPE CODE	SAMPLE DATE	EFF. DATE	USE MOS	H2S GRAINS	LOCATION
00 ***	04-16-87	04-28-87	06	0	4 F 13

	NORMAL MOL%	GPM
CO2	.52	.000
H2S	.00	.000
N2	1.21	.000
METHANE	76.10	.000
ETHANE	11.47	3.068
PROPANE	6.33	1.745
ISO-BUTANE	1.17	.383
NORM-BUTANE	1.72	.542
ISO-PENTANE	.58	.212
NORM-PENTANE	.41	.149
HEXANE PLUS	.49	.213
	100.00	6.312

SPECIFIC GRAVITY	.758
MIXTURE HEATING VALUE (BTU/CF @14.73 PSIA, 60 DEGREES,DRY)	1297
RATIO OF SPECIFIC HEATS	1.274

NO TEST SECURED FOR H2S CONTENT

*** TYPE CODE EXPLANATION SINGLE METER ANALYSIS

GXC

06-05-87

EL PASO NATURAL GAS COMPANY
MEASUREMENT DEPARTMENT
POST OFFICE BOX 1492
EL PASO, TEXAS 79978

MAILEE
04920

CHROMATOGRAPHIC GAS ANALYSIS REPORT

NATIONAL CO-OP REFINERY ASSN
1775 SHERMAN ST. SUITE 3000
DENVER, CO 80203

ANAL DATE 00-00-00

METER STATION NAME
CANDADO #21A CH

METER STA 90722
OPER 6311

TYPE CODE	SAMPLE DATE	EFF. DATE	USE MOS	H2S GRAINS	LOCATION
00 ***	04-16-87	04-28-87	06	0	4 F 13

	NORMAL MOL%	GPM
CO2	1.34	.000
H2S	.00	.000
N2	.96	.000
METHANE	85.87	.000
ETHANE	6.48	1.733
PROPANE	3.06	.843
ISO-BUTANE	.73	.239
NORM-BUTANE	.77	.243
ISO-PENTANE	.32	.117
NORM-PENTANE	.19	.069
HEXANE PLUS	.28	.122
	100.00	3.366

SPECIFIC GRAVITY	.673
MIXTURE HEATING VALUE (BTU/CF @14.73 PSIA, 60 DEGREES,DRY)	1148
RATIO OF SPECIFIC HEATS	1.289

NO TEST SECURED FOR H2S CONTENT

*** TYPE CODE EXPLANATION SINGLE METER ANALYSIS

GXC

ALLOCATION FORMULA

The recommended allocation of production back to the Chacra and Mesaverde formations is based on the percentage of gas historically produced from each formation to the total amount of gas produced from the wellbore.

The established production declines were extrapolated to mid-year 1987. The monthly values from that point were individually divided by the sum of the values and multiplied by 100 to get the percentage production for each formation. This procedure is outlined arithmetically below.

$$\text{Chacra Allocation} = \frac{\text{Chacra Production}}{\text{Chacra + Mesaverde Prod. combined}} \times 100$$

$$\text{Mesaverde Allocation} = \frac{\text{Mesaverde Production}}{\text{Chacara + Mesaverde Prod. combined}} \times 100$$

National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil Division Office

July 29, 1987

Offset Operators

RE: Candado #21A
Section 4, T26N-R7W
Rio Arriba County, NM

Gentlemen:

National Cooperative Refinery Association is applying to the New Mexico Oil Conservation Division pursuant to NMOCD Rule 303C for administrative approval to commingle production from the Mesaverde and Chacra zones in the subject well. If you have no objections to this application we ask that you sign and return one copy of the enclosed Waiver of Objection to the NMOCD in the envelope provided.

Please contact the undersigned at (303)861-4883 if you have any questions pertaining to this application.

Sincerely,

A. M. O'Hare

A.M. O'Hare
Joint Operations Supervisor

/bvl
enc

National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil Division Office

WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 21A and located in Unit P, Section 4, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: _____

Name(print): _____

Title: _____

Firm: _____

Date: _____

8/3/87

Form 3160-5
(November 1983)
(Formerly 9-331)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Form approved.
Budget Bureau No. 1004-0135
Expires August 31, 1985

5. LEASE DESIGNATION AND SERIAL NO.: SF-079161

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

7. UNIT AGREEMENT NAME:

2. NAME OF OPERATOR: National Cooperative Refinery Association

8. FARM OR LEASE NAME: Candado

3. ADDRESS OF OPERATOR: 1775 Sherman Street, Suite 3000, Denver, CO 80203

9. WELL NO.: 21A

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 840' FSL x 935' FEL

10. FIELD AND POOL, OR WILDCAT: Blanco Mesa Verde-Otero Chacra

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 4, T26N, R7W

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

12. COUNTY OR PARISH: Rio Arriba

13. STATE: NM

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other)			
(Other) Comingle Well			☒	(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) *

It is our intention to seek administration approval for downhole comingling of the Mesa Verde and Chacra Zones in this well from New Mexico Oil Conservation Division.

18. I hereby certify that the foregoing is true and correct

SIGNED J. M. O'Hare TITLE Jt. Operations Supervisor DATE 8-8-87

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil Division Office

WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 21A and located in Unit P, Section 4, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: G. F. Reiger

Name(print): G. F. REIGER

Title: Mgr. Outside Opns

Firm: DEPCO, INC

Date: 8-20-87

8/3/87

National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil Division Office

WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 21A and located in Unit P, Section 4, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: Lon H Pardue

Name(print): LON H. PARDUE

Title: Casper District Oper. Manager

Firm: UNION OIL CO. OF CALIFORNIA

Date: 9-1-87

8/3/87

National Cooperative Refinery Association

1775 SHERMAN STREET, SUITE 3000 • DENVER, COLORADO 80203 • 303/861-4883

Crude Oil Division Office

WAIVER OF OBJECTION

The undersigned, as an offset operator to National Cooperative Refinery Association's dual Mesaverde/Chacra producer known as Candado No. 21A and located in Unit P, Section 4, T26N, R7W, Rio Arriba County, New Mexico, does hereby waive any and all objections to NCRA's application for downhole commingling of the above specified well.

By: Clyde E. Phillips

Name(print): Clyde E. Phillips

Title: District Superintendent

Firm: Ladd Petroleum Corporation

Date: 8-17-87

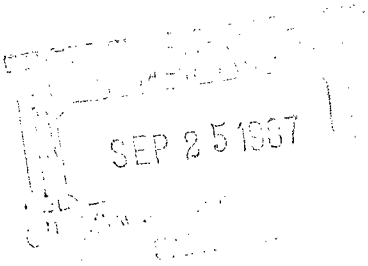
8/3/87

STATE OF NEW MEXICO

ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE

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



OIL CONSERVATION DIVISION
BOX 2088
SANTA FE, NEW MEXICO 87501

DATE 9-18-87

RE: Proposed MC _____
Proposed DHC X
Proposed NSL _____
Proposed SWD _____
Proposed WFX _____
Proposed PMX _____

Gentlemen:

I have examined the application dated 9-15-87

for the Natl Cooperative Refinery Assoc. Caudado #2A P-4-26N-7W
Operator / Lease and Well No. / Unit, S-T-R

and my recommendations are as follows:

Approve with an allocation of 71% gas to the MV
+ 29% to the Chacra.

Yours truly,

Leo Gurule