Amoco Production Company (USA)
Petroleum Center Building
501 Airport Drive
Farmington, New Mexico 87401
505-325-8841

R. W. Schroeder
District Superintendent

[illegible]
APR 23 1982
OIL CON. COM.
DIST. 3

April 22, 1982

New Mexico Oil Conservation Division
1000 Rio Brazos Rd.
Aztec, NM 87410

New Mexico Oil Conservation Division
Box 2088
Santa Fe, NM 87501

File: WLP-160-986.510.1

Commingling Application for the Jack Frost B No. 1E
615' FSL x 810' FWL Section 27, T27N, R10W, San Juan County, New Mexico

Amoco Production Company requests approval to commingle production from the Angels Peak Gallup and Basin Dakota pools in the subject well. This commingling will utilize a production packer set between the two zones at 5920' and a sliding sleeve set at 5832' to produce up a 2-3/8" tubing string landed at 6509'.

The commingling of the Gallup and Dakota is necessary because of the low producing rates in the Gallup. After an extended completion period lasting eight months, the Gallup would produce an average of only 225 MCFD and 2 BOPD. To obtain this prodution rate it was necessary to swab the well several times daily. It is assumed the well will not produce by flowing and it will be necessary to utilize the energy in the Dakota to lift the hydrocarbons. Therefore, the only way to produce the zone is by commingling with the Dakota production. The proposed commingling will not adversely affect either zone for the following reasons.

1. Neither zone at the present time produces any formation water. The Gallup did produce some water during swab and flow operations but from water analysis it is shown that this was load water (see Attachment 12).
2. Neither zone has a history of sensitivity to liquid hydrocarbons and should not be damaged by either zone's condensate production.
3. Several offsets have had good success in the downhole commingling of both zones, the most recent being the commingling of Dugan Production Company's McAdams No. 3, Order No. R-5313 one mile to the southeast (see Attachment 2).
4. Since both zones produce gas of approximately the same composition, there will be no loss of value as a result of the commingling.
5. Both zones have common ownership, so there will be no problems in allocating royalty or working interest payments.

6. The bottom hole pressure of the Gallup is 48.1 percent that of the Dakota adjusted to a common datum. While that is 1.9 percent below that set down in NMOCD Rule 303C Order No. R-6882, we submit that this will not adversely affect production due to crossflow for the following reasons:

   a. The Dakota was shut in a total of one year two months following its completion 1-31-81. The zone was shut in while the Gallup was being worked over and completed and because stock tanks could not be drained due to bad roads caused by inclimate spring weather.

   b. Within a few months, this well will follow the production history of other infill Dakota wells in the area and production and bottom hole pressure will drastically decline in the Dakota.

   c. A 1.9 percent shortcoming in the Gallup BHP is within the margin of error in the method used to estimate Gallup bottom hole pressure. That method was to shoot a sonolog which indicated the top of the liquid and to use the Redlich-Kwong correlation to estimate the pressure to the top of the fluid level.

In compliance with NMOCD Rule 303C, "Downhole Commingling," please find attached two copies of each of the following:

Attachment No.	
1	"Well Location and Dedication Plat" (NMOCD Form C-102). The Gallup dedication plat is currently being processed.
2	Well location map showing location of all outside operated wells.
3	List of names and addresses of operators of all outside operated wells.
4	A complete well completion history (USGS Form 9-331, "Sundry Notices and Reports on Wells").
5	A complete engineering completion summary on both zones along with complete well test data on the Gallup.
6	NMOCD Form C-116 for the Dakota showing the results of a 168 hour flow test.
7	NMOCD Form C-116 for the Gallup showing the results of a 244 hour flow test. State rules require current (within 30 days) productivity tests. The Gallup test was taken

10-22-81 to 11-3-81. The well was flared for six days then shut in to the present time. Since the Gallup was shut in to the present, we request an exception to be granted to the 30-day limit required for the Gallup.

8 Actual bottom hole pressure taken for the Dakota and bottom hole pressure calculations for the Gallup adjusted to a common datum.

9 A copy of the gas analysis of produced gas from the Dakota.

10 A copy of the gas analysis of produced gas from the Angels Peak Gallup.

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

12 Water analysis of load water from the Gallup zone.

To allocated production to the individual Gallup and Dakota horizons we recommend the following:

1. Allocate 19.68 percent of the gas production as shown on Form C-116 to the Gallup horizon.
2. Allocate 80.32 percent of the gas production as shown on Form C-116 to the Dakota production.
3. Allocate 6.9 percent of the oil production as shown on Form C-116 to the Gallup horizon.
4. Allocate 93.1 percent of the oil production as shown on Form C-116 to the Dakota horizon.
5. Test each zone 30 days after approval of commingling and submit a Form C-116 stating each zone's actual oil and gas productivity under commingling conditions and allocating each zone's production accordingly.

We would like to obtain approval for this well as soon as possible so that we can begin production. Your prompt handling of this matter is appreciated.

Sincerely,

D. W. Schroede

DWS/tk
Attachments

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

OIL CONSERVATION DIVISION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

ATTACHMENT NO. 1

Form C-102
Revised 10-1-78

All distances must be from the outer boundaries of the Section

Operator AMOCO PRODUCTION COMPANY		Lease JACK FROST "B"		Well No. 1-E
Unit Letter M	Section 27	Township 27N	Range 10W	County San Juan
Actual Footage Location of Well: 615 feet from the South line and 810 feet from the West line				
Ground Level Elev. 6158	Producing Formation Dakota	Pool Basin Dakota		Dedicated Acreage: 320 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

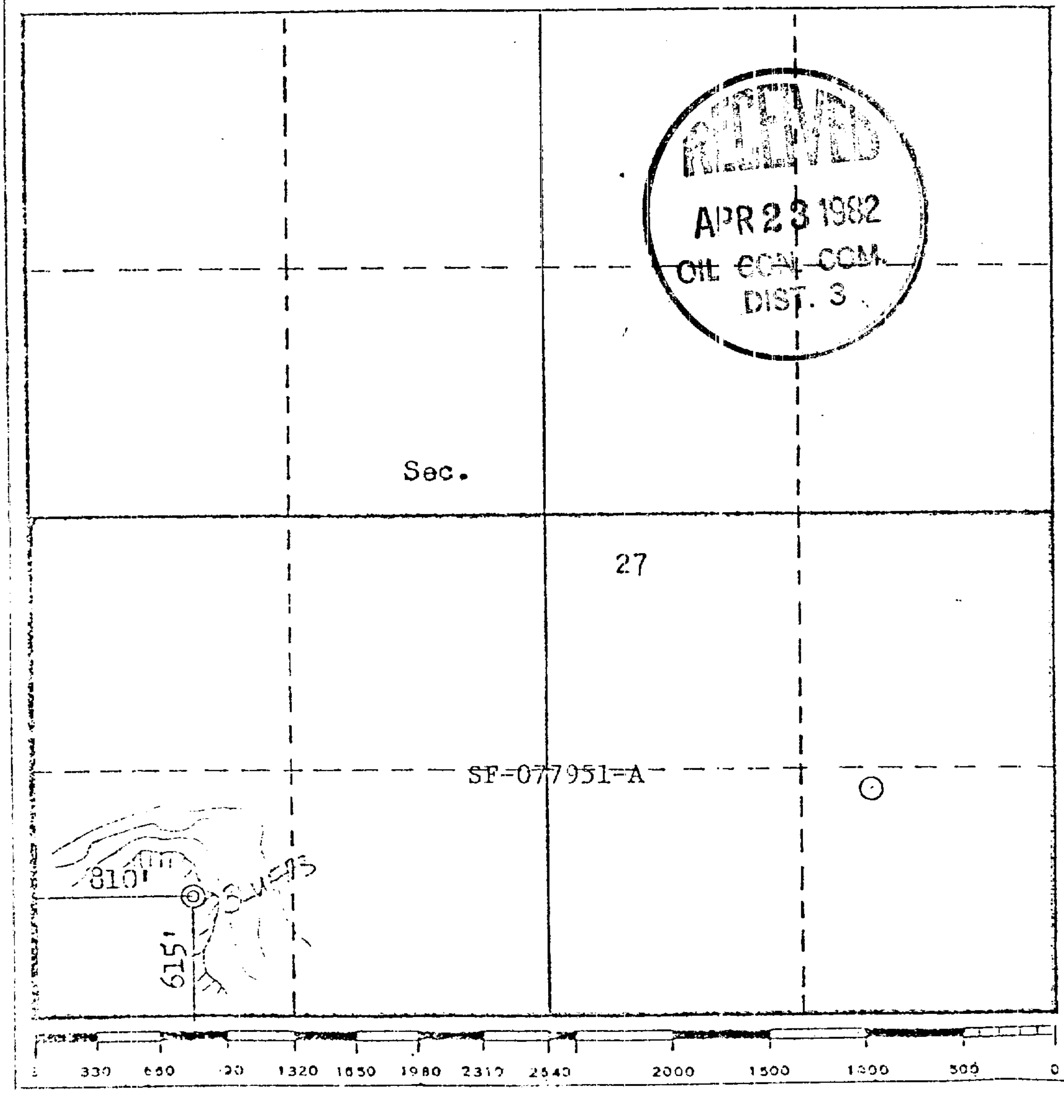
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☒ Yes ☐ No If answer is "yes," type of consolidation Communitization

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.)

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



RECEIVED
APR 23 1982
OIL CON. COM.
DIST. 3

CERTIFICATION

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

B. E. Fackrell

Name
B.E. FACKRELL

Position
DISTRICT ENGINEER

Company
AMOCO PRODUCTION COMPANY

Date
APRIL 18, 1980

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

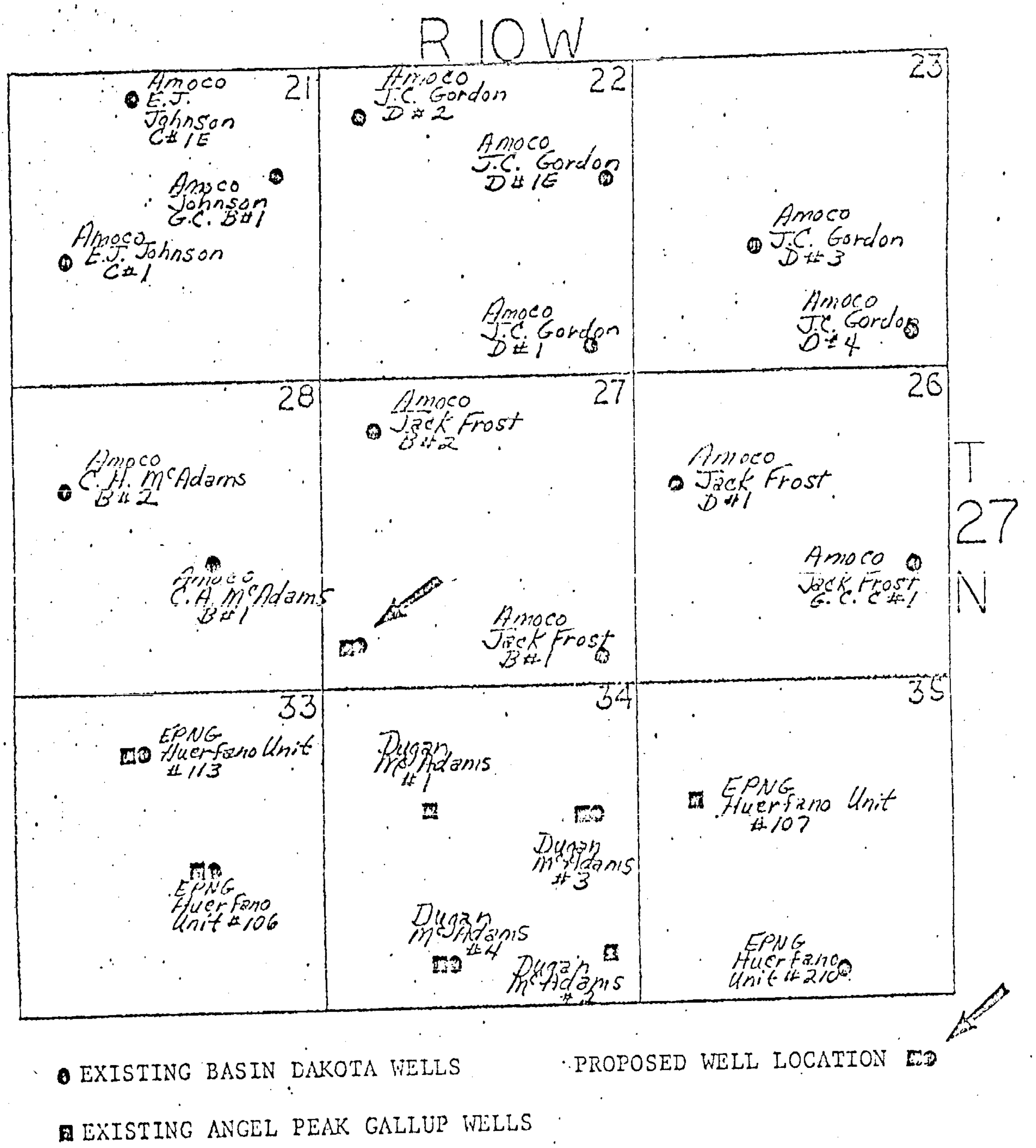
Date Surveyed
April 1[illegible], 1980

Registered Professional Engineer and/or Land Surveyor
Fred B. Kerr Jr.
Fred B. Kerr Jr.

Certificate No.
3950

JACK.FROST B #1E

ATTACHMENT NO. 2



ATTACHMENT NO. 3

List of names and addresses of operators of all outside operated wells.

Dugan Production Company
P. O. Box 208
Farmington, NM 87401

El Paso Natural Gas Company
P. O. Box 990
Farmington, NM 87401

ATTACHMENT NO. 4

Form 9-331
Dec. 1973

Form Approved.
Budget Bureau No. 42-R1424

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

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 Form 9-331-C for such proposals.)

1. oil well ☐ gas well ☒ other
2. NAME OF OPERATOR
Amoco Production Company
3. ADDRESS OF OPERATOR
501 Airport Drive, Farmington, NM 87401
4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: 615' FSL x 810' FWL
AT TOP PROD. INTERVAL: Same
AT TOTAL DEPTH: Same

5. LEASE
SF 077951A
6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
Jack Frost "B"
9. WELL NO.
1E

WF

10. FIELD OR WILDCAT NAME
Basin Dakota/Angels Peak Gallup
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA SW/4, SW/4, Section 27, T27N, R10W
12. COUNTY OR PARISH San Juan
13. STATE NM
14. API NO.
30-045-24356
15. ELEVATIONS (SHOW DF, KDB, AND WD)
6158' GL

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

	REQUEST FOR APPROVAL TO:	SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	☐	☐
FRACTURE TREAT	☐	☐
SHOOT OR ACIDIZE	☐	☐
REPAIR WELL	☐	☐
PULL OR ALTER CASING	☐	☐
MULTIPLE COMPLETE	☐	☐
CHANGE ZONES	☐	☐
ABANDON*	☐	☐
(other) Completion		

RECEIVED
MAR 12 1981
U. S. GEOLOGICAL SURVEY
FARMINGTON, N. M.

E: Report results of multiple completion or zone change on Form 9-330.)

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.)*

Completion operations commenced on 1-28-81. Total depth of the well is 6615' and plug back depth is 6566. Perforated intervals from 6500-6508, 6419-6461, 6369-6375 with 2 spf, a total of 112, .38" holes. Fraced Dakota intervals with 108,000 gallons of frac fluid and 367,000# 20-40 sand. Perforated intervals from 5757-5782 with 2 spf, a total of 50, .38" holes. Fraced with 20,500 gallons of frac fluid and 71,000# of 20-40 sand. Perforated intervals from 5489-5497, 5503-5508, 5590-5609, 5618-5623, 5661-5711, with 2 spf, a total of 174, .38" holes. Frac Gallup with 100,000 gallons of frac fluid and 125,000# of 20-40 sand. Land 2 3/8" tubing at 5781'. Swabbed the well and released the rig on 2-27-81.

Subsurface Safety Valve: Manu. and Type ______ Set @ ______ Ft.

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

SIGNED Original Signed By [illegible] TITLE Dist. Admin. Supvr DATE 3/11/81

(This space for Federal or State office use)

APPROVED BY ______ TITLE ______ DATE ______
CONDITIONS OF APPROVAL, IF ANY:

OPERATOR

ACCEPTED FOR RECORD
MAR 13 1981
FARMINGTON DISTRICT
BY ______

0+4- USGS- Farmington
1 - M.F. Brown
1 - Ores
1 - EPNG, ARCO, TENNECO, CONOCO

*See Instructions on Reverse Side

ATTACHMENT NO. 4

COMPLETION HISTORY, JACK FROST "B" NO. 1E

1-29-81: Move in and rig up service unit.

1-31-81: Perforated 6461-6419', 6379'-6369', 6500'-6508' with 2 JSPF. Fraced Dakota with 108,000 gallons 40 & 30 lbs crosslinked gelled water with 5% condensate. Flushed with 10,235 gallons 2% KCL water. ISIP 740 psi.

2-2-81: Perforate 5757'-5782' with 2 JSPF. Fraced Gallup with 20,500 gallon 40 lb crosslinked gelled water with 5% condensate. Flush with 9,251 gallons 2% KCL water ISIP 350 psi.

2-7-82: Perforated Gallup 5489'-5497', 5503'-5508', 5590'-5609', 5618'-5623', 5661'-5711'. Perforate 5533'-5542'. Frac entire interval down casing with 100,000 gallons 75 quality foam with 20 lb gelled water and 8 gal suds/1000 gallons flush with 8320 gallons foam. ISIP 700 psi.

Well Test Data in the Gallup

Date	Comments	BWPD	BOPD	MCFD
2-27	SWB	16	8	
2-28	SWB & FLW	30	-	
3-1	SWB & FLW	22-1/2	2-1/2	
3-2	SWB & FLW	30	3	
3-10	FLW		20	
3-13	FLW	80	20	
3-14	SWB		38	
3-15	SWB & FLW		40	
3-18	SWB & FLW		60	
3-19	SWB & FLW		24	
3-22	SWB		0	94
3-23	SWB & FLW		17	64
3-24	FLW		16	76
3-25	FLW		10	70
3-27	Well Dead - WO Workover			

3-28-81 to 9-28-81: Well was SI, WO workover

9-29-81: Move in and rig up service unit

10-2-81: Set packer at 5369 ft. Rig up Howco and pumped 5900 gal of 2% KCL and 1 gal surfactant per 1000 gallons water. Nitrified water with 600 SCF/BBL, 79,500 SCF nitrogen used. Rate was 3 BPM at 2750 psi. ISIP was 1700 psi; 15 ISIP was 1650 psi. Rigged down Howco.

Test Summary:

Date	Comments	BWPD	BOPD	MCFD
10-3-81	SWB	55	trace	
10-4-81	SWB	38	trace	
10-5-81	SWB	25	4	
10-7-81	SWB & FLW	30	5	
10-8-81	SWB & FLW	40	9	
10-10-81	SWB & FLW	1	3	333
10-12-81	SWB & FLW	2	3	163
10-14-81	SWB & FLW	1	0	130
10-15-81	SWB & FLW	2	3	123

COMPLETION HISTORY, JACK FROST "B" NO. 1E (Cont.)

Date	Comments	BWPD	BOPD	MCFD
10-16-81	Pumped 5700 gal nitrified paraffin acid dispersent			
10-22-81	SWB & FLW	1	1	155
10-23-81	SWB & FLW	.3	1.5	152
10-24-81	SWB & FLW	.75	1	188
10-26-81	SWB & FLW	.75	2.8	287
10-27-81	SWB & FLW	-	3	237
10-28-81	SWB & FLW	0	.5	186
10-29-81	SWB & FLW	1	1.5	237
10-30-81	SWB & FLW	1	5	208
10-31-81	SWB & FLW	-	1.5	290
11-1-81	SWB & FLW	1	3	257
11-2-81	SWB & FLW	-	3	307
11-3-81	SWB & FLW	-	2	203

11-4-81 to 11-10-81: Blow well to bit and flare
11-10-81: SI to present

ATTACHMENT NO. 6

STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT

[illegible]
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

Form C-116
Revised 10-1-78

GAS-OIL RATIO TESTS

Operator Amoco Production Company	Pool Basin Dakota	County San Juan

Address
501 Airport Drive, Farmington, NM 87401

TYPE OF TEST - (X) Scheduled ☒ Completion ☐ Special ☐

LEASE NAME	WELL NO.	LOCATION				DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST				GAS - OIL RATIO CU.FT/BBL
		U	S	T	R							WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	
Jack Frost B	1E	M	27	27	10	4-12-82 to 4-18-82	F	Open	81		168	0		203	6,445	31,747

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.

(Signature)

(Title)

ATTACHMENT NO. 7

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 Amoco Production Company	Pool Angel Peak Gallup	County San Juan

Address
501 Airport Drive, Farmington, NM 87401

TYPE OF TEST - (X) Scheduled ☐ Completion ☐ Special ☒

LEASE NAME	WELL NO.	LOCATION				DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST				GAS - OIL RATIO CU.FT/BBL
		U	S	T	R							WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	
Jack Frost B	1E	M	27	27	10	10-22-81 to 11-3-81	F	OPEN	100		288	5.8		25.8	2707	104,922

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.

(Signature)

(Title)

ATTACHMENT NO. 8

BHP Calculations for the Jack Frost B No. 1E

BHP of the Basin Dakota side as measured by a 3000 psi Amerada RPG-3 downhole gauge is:

Date	Depth Stopped	Extension	Pressure
3-23-82	Surface	.846	1278
3-23-82	6508	1.042	1586

Pressure gradient is .0473 psi/ft.
Depth of Main Gallup pay is 5770
BHP corrected to Gallup datum is: 1551

BHP of the Gallup side calculated from surface pressure using the Redlich-Kwong correlation and height of fluid above Main Gallup pay at 5770

Date	Joints to Fluid	Feet to Fluid	Fluid Above Perfs
3-23-82	180	5460	310'

Surface pressure: 508 psi
Pressure at top of fluid from Redlich-Kwong Correlation: 613 psi

F.L. above Main Gallup pay: 310'
Pressure using a gradient of .433 psi/ft: 134 psi

Summary: Dakota BHP at Gallup Datum (5770') - 1551 psi
Gallup BHP at 5770' - 747 psi

ATTACHMMENT NO. 9

09/11/81

EL PASO NATURAL GAS COMPANY
MEASUREMENT DEPARTMENT
POST OFFICE BOX 1492
EL PASO, TEXAS 79999

CHROMATOGRAPHIC GAS ANALYSIS REPORTS

ESTIMATE

AMOCO PRODUCTION CO.
ATTN: O. N. THURSTON
501 AIRPORT DRIVE
FARMINGTON, NM 87401

METER STA 93396
ANAL DATE 09 01 81 METER STATION NAME OPER 0203
JACK FROST B #2E

TYPE CODE	SAMPLE DATE	EFF. DATE	USE MOS.	SCALE	H2S GRAINS	LOCATION
42	08 26 81	09 09 81	01			4 M 03

	NORMAL MOL%	GPM
C O 2	1.16	.000
H 2 S	.00	.000
N2	.84	.000
METHANE	75.97	.000
ETHANE	12.34	3.298
PROPANE	5.99	1.648
ISO-BUTANE	.80	.262
NORM-BUTANE	1.57	.495
ISO-PENTANE	.46	.168
NORM-PENTANE	.39	.141
HEXANE PLUS	.48	.210
TOTALS	100.00	6.222

SPECIFIC GRAVITY .752

MIXTURE HEATING VALUE
(BTU/CF AT 14.73 PSIA,60 DEGREES,DRY) 1,280

RATIO OF SPECIFIC HEATS 1.276

NO TEST SECURED FOR H2S CONTENT

ATTACHMENT NO. 10

10/09/81

EL PASO NATURAL GAS COMPANY
MEASUREMENT DEPARTMENT
POST OFFICE BOX 1492
EL PASO, TEXAS 79999

CHROMATOGRAPHIC GAS ANALYSIS REPORTS

DUGAN PRODUCTION CORP.
P.O. BOX 208
FARMINGTON, NM 87401

METER STA 74713
OPER 1862

ANAL DATE 10 07 81

METER STATION NAME
MCADAMS #3 GL ✓

TYPE CODE	SAMPLE DATE	EFF. DATE	USE MOS.	SCALE	H2S GRAINS	LOCATION
00	10 06 81	10 09 81	06			4 F 02

	NORMAL MOL%	GPM
C O 2	1.15	.000
H 2 S	.00	.000
N2	1.36	.000
METHANE	76.37	.000
ETHANE	11.39	3.045
PROPANE	5.72	1.574
ISO-BUTANE	.86	.262
NORM-BUTANE	1.62	.510
ISO-PENTANE	.61	.223
NORM-PENTANE	.59	.214
HEXANE PLUS	.39	.170
TOTALS	100.00	5.998

SPECIFIC GRAVITY .753

MIXTURE HEATING VALUE
(BTU/CF AT 14.73 PSIA,60 DEGREES,DRY) 1,271

RATIO OF SPECIFIC HEATS 1.273

NO TEST SECURED FOR H2S CONTENT