

9000



8000

7000

6000

5000

4000

3705 MCF / D

5163 MCF / D

6522 MCF / D

7893 MCF / D

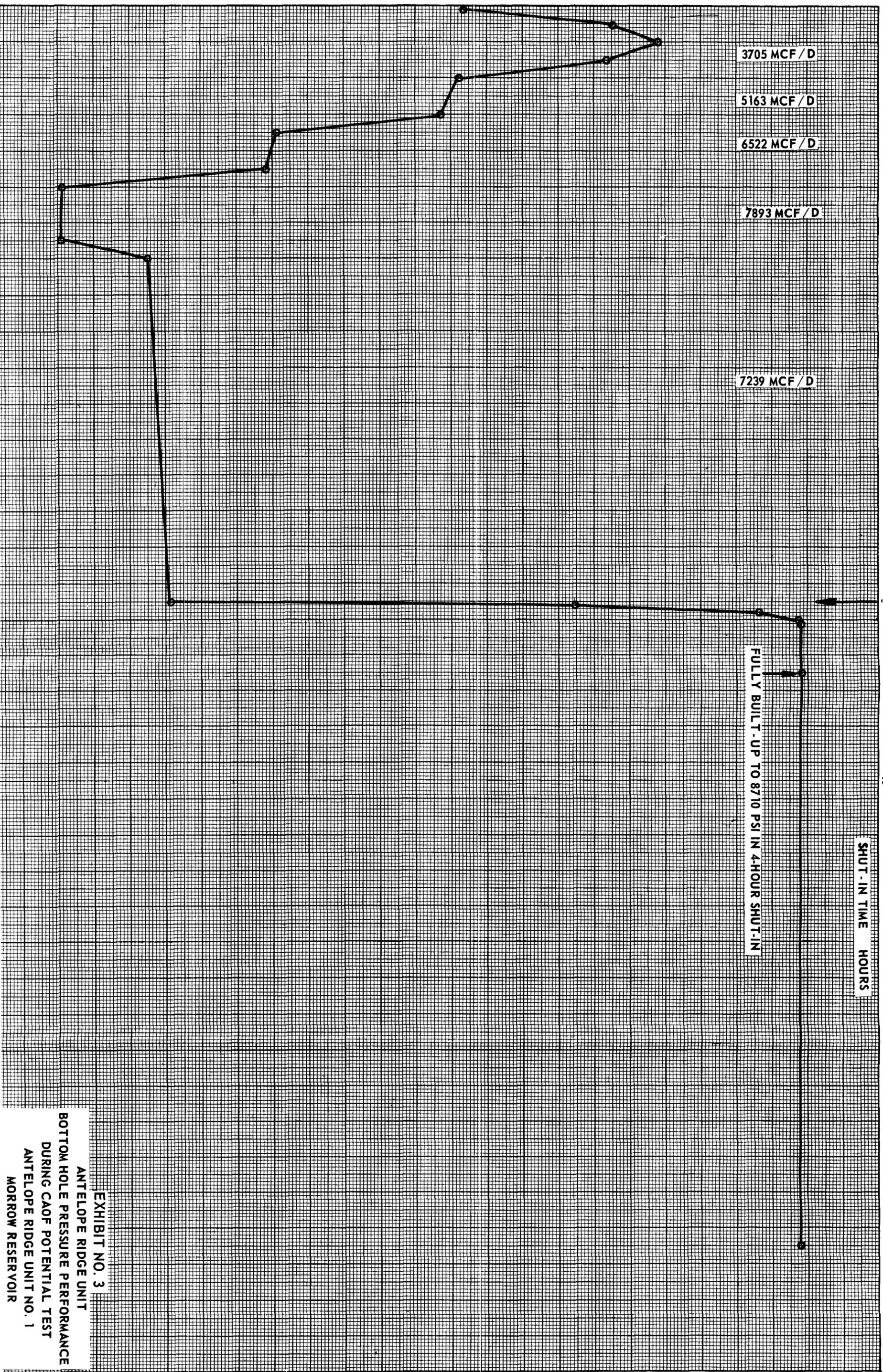
7239 MCF / D

FULLY BUILT - UP TO 8710 PSI IN 4-HOUR SHUT-IN

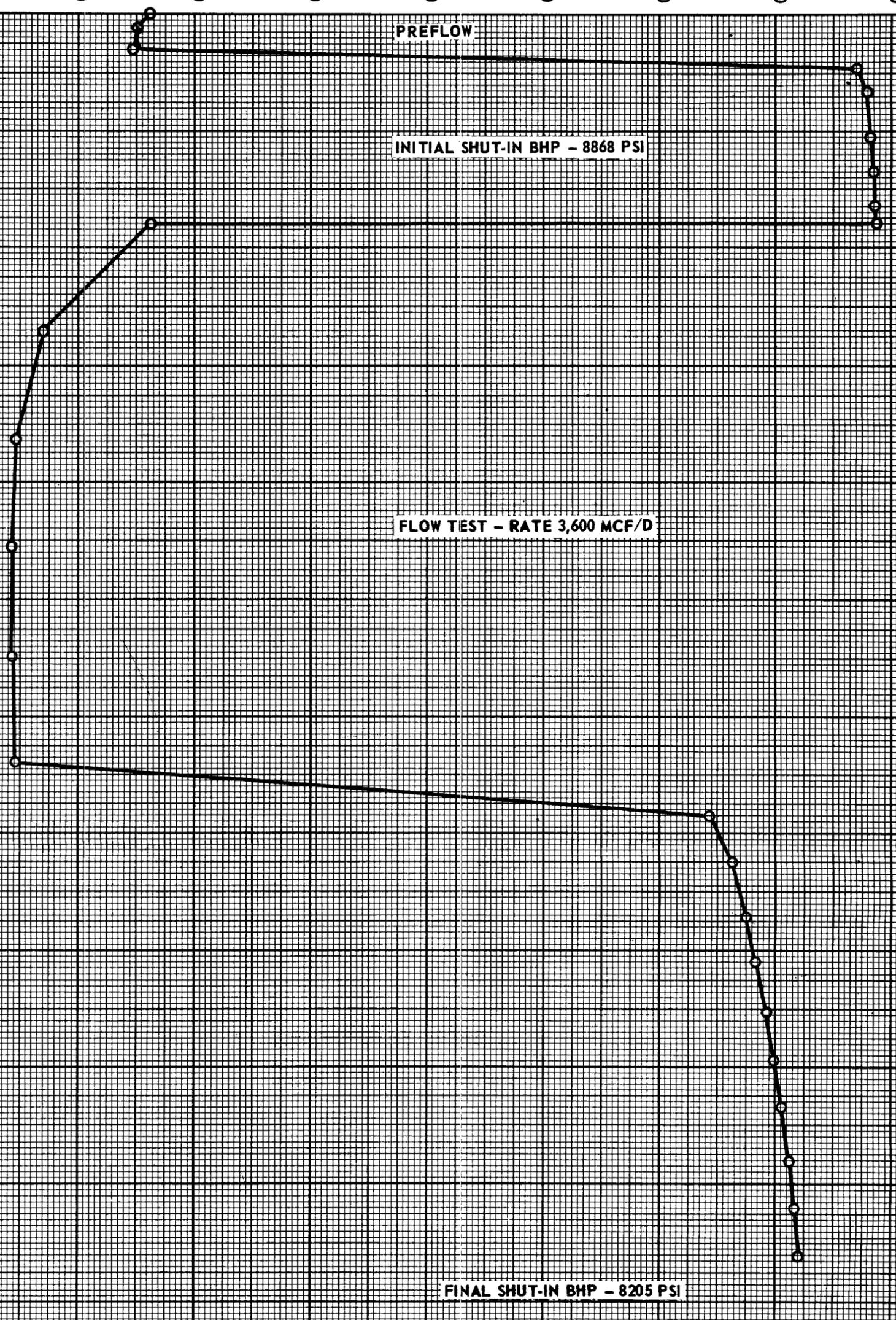
SHUT-IN TIME HOURS

EXHIBIT NO. 3

ANTELOPE RIDGE UNIT
BOTTOM HOLE PRESSURE PERFORMANCE
DURING CAOP POTENTIAL TEST
ANTELOPE RIDGE UNIT NO. 1
MORROW RESERVOIR



1000 2000 3000 4000 5000 6000 7000 8000 9000



FINAL SHUT-IN BHP - 8205 PSI

FLOW TEST - RATE 3,600 MCF/D

INITIAL SHUT-IN BHP - 8868 PSI

PREFLOW

EXHIBIT NO. 4

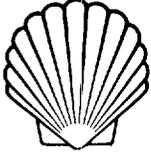
ANTELOPE RIDGE UNIT

BOTTOM HOLE PRESSURE PERFORMANCE

DURING DRILL STEM TEST

ANTELOPE RIDGE UNIT NO. 3

MORROW RESERVOIR



SHELL OIL COMPANY

PETROLEUM BUILDING

P. O. BOX 1509

MIDLAND, TEXAS 79704

October 11, 1966

Subject: Lea County, New Mexico
Antelope Ridge Unit
Revision of Participating Areas

The Director
United States Geological Survey
Washington 25, D. C.

Through:

Regional Oil and Gas Supervisor
United States Geological Survey
P. O. Drawer 1857
Roswell, New Mexico

Commissioner of Public Lands
P. O. Box 1148
Santa Fe, New Mexico

→ Oil Conservation Commission
State Lands Building
Santa Fe, New Mexico

Gentlemen:

We are pleased to now attach for your respective records two fully approved copies of our July 15, 1966 application to revise the Initial Pennsylvanian Participating Area for the subject unit with the result that the identical lands originally included in that area will now cover the Initial Participating Areas for both the Antelope Ridge Atoka Formation and the Antelope Ridge Morrow Formation.

We trust you will find the mentioned letter of July 15, 1966 to be self-explanatory and that you will let us know should you need anything additional in this respect.

ACW:DRP

A. C. Wheat

Attachment

cc - Continental Oil Company
Permian Building
Midland, Texas



IN REPLY REFER TO:

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Drawer 1857
Roswell, New Mexico 85201

September 20, 1966

Shell Oil Company
P. O. Box 1509
Midland, Texas 79701

Attention: Mr. J. E. R. Sheeler

Gentlemen:

The initial Atocha participating area and change in name of the initial Pennsylvania participating area to the initial Morrow participating area, Antelope Ridge unit agreement, Lea County, New Mexico, was approved on September 9, 1966, by the Acting Director, Geological Survey, effective as of March 1, 1966.

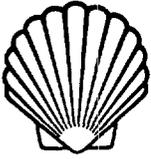
Three approved copies of the application are enclosed. You are requested to furnish all interested principals with appropriate evidence of this approval.

Sincerely yours,

(ORIG. SGD.) JOHN A. ANDERSON

JOHN A. ANDERSON
Regional Oil and Gas Supervisor

cc:
Washington (ltr. only)
H bbs (w/cy appd. appl.)
Com. of Pub. Lands, Santa Fe (ltr. only)
BMOCC, Santa Fe (ltr. only) ✓
Accounts



SHELL OIL COMPANY

WESTERN DIVISION
P. O. BOX 1509
MIDLAND, TEXAS 79704

2717

August 15, 1966

Subject: Antelope Ridge Unit (14-08-001-8492)
Lea County, New Mexico
Application for Separation of Initial
Participating Area, Pennsylvanian
Formation into Atoka Participating
Area and Morrow Participating Area

66 AUG 18 PM 1 07

Commissioner of Public Lands
State Land Building
Santa Fe, New Mexico

Oil Conservation Commission
State Land Building
Santa Fe, New Mexico

Gentlemen:

Attached for each of you are two copies of page 2 of the subject application which have been amended to adjust for the completion date of Antelope Ridge Unit No. 2. Our application as approved by each of you inadvertently showed the completion date as July 20, 1963. The official completion date actually occurred on September 12, 1963, but the OPT was based on an extended test completed on July 20, 1963 while drilling was in progress.

If this adjustment meets with your approval will you please substitute this amended copy of page 2 in your files. We are forwarding corrected copies to the United State Geological Survey together with copies of the application as executed by the Commissioner of Public Lands and the Oil Conservation Commission.

Yours very truly,


J. E. R. Sheeler
Division Production Manager

Attachment

Effective Date: March 1, 1966

Vertical Limits: 12,854 to 13,840 feet in reference to Antelope Ridge Unit No. 2.

2) Initial Participating Area for the Antelope Ridge Atoka Formation

Description: Same as for Morrow Formation (see Schedule II)

Effective Date: March 1, 1966

Vertical Limits: 12,092 to 12,854 feet in reference to Antelope Ridge Unit No. 2.

Antelope Ridge Unit No. 2 (formerly Federal BE No. 1) was completed on September 12, 1963, for a calculated open flow potential of 38 million cubic feet of gas per day through perforations opposite the Morrow formation in the interval 12,898 to 13,153 feet. Gas sales commenced during January 1964, and the well had accumulated 2.886 billion cubic feet of gas and 25,000 barrels of condensate by March 1, 1966.

Antelope Ridge Unit No. 4 was completed on February 4, 1965, for a calculated open flow potential of 30 million cubic feet of gas per day through a slotted liner opposite the Atoka formation in the interval 12,212 to 12,341 feet. Gas sales commenced during June 1965, and the well had accumulated 3.041 billion cubic feet of gas and 68,000 barrels of condensate by April 1, 1966.

Production has been metered separately over the entire producing periods for both wells. From the production histories it is evident that both wells are capable of producing gas and condensate in paying quantities and are draining a horizontal area in excess of the 320-acre proration units. It is further evident that the two reservoirs can be drained effectively with existing crestal wells as proposed by the Operator in previous plans for development of the Unit. Antelope Ridge Unit No. 3, the only other penetration within the proposed revised participating areas, produced gas from both the Morrow and Atoka intervals on separate drill stem tests during drilling operations. Therefore, we propose that the boundaries as established for the Initial Participating Area for the Pennsylvanian Formation is applicable to both the Morrow and Atoka formations and respectfully request that the boundaries be approved for the newly created participating areas. It is the opinion of the operator that the participating areas as defined include all of the area that can reasonably be shown to be productive of unitized substances from the respective zones and that correlative rights will be protected as a result of this determination.

In support of this application we are submitting the following exhibits:

1. A southwest-northeast cross section of the Pennsylvanian interval showing formation correlation and well data in the zones of interest. (Exhibit No. 1)
2. A structure map contoured on top of the Atoka pay zone. The top of the Morrow formation conforms with this structural interpretation. (Exhibit No. 2)

Effective Date: March 1, 1966

Vertical Limits: 12,854 to 13,840 feet in reference to Antelope Ridge Unit No. 2.

2) Initial Participating Area for the Antelope Ridge Atoka Formation

Description: Same as for Morrow Formation (see Schedule II)

Effective Date: March 1, 1966

Vertical Limits: 12,092 to 12,854 feet in reference to Antelope Ridge Unit No. 2.

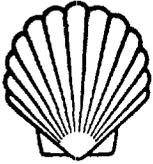
Antelope Ridge Unit No. 2 (formerly Federal BE No. 1) was completed on September 12, 1963, for a calculated open flow potential of 38 million cubic feet of gas per day through perforations opposite the Morrow formation in the interval 12,898 to 13,153 feet. Gas sales commenced during January 1964, and the well had accumulated 2.886 billion cubic feet of gas and 25,000 barrels of condensate by March 1, 1966.

Antelope Ridge Unit No. 4 was completed on February 4, 1965, for a calculated open flow potential of 30 million cubic feet of gas per day through a slotted liner opposite the Atoka formation in the interval 12,212 to 12,341 feet. Gas sales commenced during June 1965, and the well had accumulated 3.041 billion cubic feet of gas and 68,000 barrels of condensate by April 1, 1966.

Production has been metered separately over the entire producing periods for both wells. From the production histories it is evident that both wells are capable of producing gas and condensate in paying quantities and are draining a horizontal area in excess of the 320-acre proration units. It is further evident that the two reservoirs can be drained effectively with existing crestal wells as proposed by the Operator in previous plans for development of the Unit. Antelope Ridge Unit No. 3, the only other penetration within the proposed revised participating areas, produced gas from both the Morrow and Atoka intervals on separate drill stem tests during drilling operations. Therefore, we propose that the boundaries as established for the Initial Participating Area for the Pennsylvanian Formation is applicable to both the Morrow and Atoka formations and respectfully request that the boundaries be approved for the newly created participating areas. It is the opinion of the operator that the participating areas as defined include all of the area that can reasonably be shown to be productive of unitized substances from the respective zones and that correlative rights will be protected as a result of this determination.

In support of this application we are submitting the following exhibits:

1. A southwest-northeast cross section of the Pennsylvanian interval showing formation correlation and well data in the zones of interest. (Exhibit No. 1)
2. A structure map contoured on top of the Atoka pay zone. The top of the Morrow formation conforms with this structural interpretation. (Exhibit No. 2)



SHELL OIL COMPANY

WESTERN DIVISION
P. O. BOX 1509
MIDLAND, TEXAS 79704

July 15, 1966

LAND DEPARTMENT			
Midland Area			
RECEIVED			
SEP 27 1966			
JVL	RDM	ALE	OWH
RAC	RJO	JCM	TJC

Gen. Del. Co.

Subject: Antelope Ridge Unit (14-08-001-8492)
Lea County, New Mexico
Application for Separation of
Initial Participating Area
Pennsylvanian Formation into
Atoka Participating Area and
Morrow Participating Area

The Director
United States Geological Survey
Washington 25, D.C.

Commissioner of Public Lands
State Land Building
Santa Fe, New Mexico

Through:

Regional Oil and Gas Supervisor
United States Geological Survey
P.O. Drawer 1857
Roswell, New Mexico

Oil Conservation Commission
State Land Building
Santa Fe, New Mexico

As originally approved, the Initial Participating Area for the Pennsylvanian Formation in the Antelope Ridge Unit was in conformance with field rules established by NMOCC Order No. 2911, effective May 24, 1965. This Order defined the vertical limits of the Antelope Ridge Morrow Pennsylvanian gas pool within the interval 11,854 feet to 13,840 feet in Antelope Ridge Unit Well No. 2 (formerly Federal BE No. 1). As shown on Exhibit No. 1, the vertical pool limits included both the Atoka and Morrow formations. The Initial Participating Area was established to include the 160-acre producing tract dedicated to Antelope Ridge Unit No. 2 and the eight contiguous quarter sections comprising the following acreage:

S/2 Section 33 and SW/4 Section 34, T-23-S, R-34-E; W/2 Section 3 and all Section 4, T-24-S, R-34-E, totaling 1439.71 acres.

By NMOCC Order No. 3050, effective March 17, 1966, the Antelope Ridge Morrow Pennsylvanian Gas Pool was abolished and the Antelope Ridge Atoka Gas Pool and the Antelope Ridge Morrow Gas Pool were established. At this time, the Atoka and Morrow Gas Pools were placed on 320-acre spacing.

Inasmuch as two separate pools have been established to replace the original Morrow Pennsylvanian Gas Pool, Shell Oil Company, as Unit Operator, hereby makes application, in accordance with Section 11 of the Unit Agreement, to separate the Initial Participating Area for the Antelope Ridge Pennsylvanian formation into two participating areas to be designated as follows:

1) Initial Participating Area for the Antelope Ridge Morrow Formation

Description: S/2 Section 33 & SW/4 Section 34, T-23-S, R-34-E;
W/2 Section 3, all Section 4, T-24-S, R-34-E.
Total acres - 1439.71 (see Schedule I)

Effective Date: March 1, 1966

Vertical Limits: 12,854 to 13,840 feet in reference to Antelope Ridge Unit No. 2.

2) Initial Participating Area for the Antelope Ridge Atoka Formation

Description: Same as for Morrow Formation (see Schedule II)

Effective Date: March 1, 1966

Vertical Limits: 12,092 to 12,854 feet in reference to Antelope Ridge Unit No. 2.

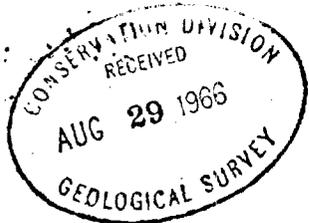
Antelope Ridge Unit No. 2 (formerly Federal BE No. 1) was completed on September 12, 1963, for a calculated open flow potential of 38 million cubic feet of gas per day through perforations opposite the Morrow formation in the interval 12,898 to 13,153 feet. Gas sales commenced during January 1964, and the well had accumulated 2.886 billion cubic feet of gas and 25,000 barrels of condensate by March 1, 1966.

Antelope Ridge Unit No. 4 was completed on February 4, 1965, for a calculated open flow potential of 30 million cubic feet of gas per day through a slotted liner opposite the Atoka formation in the interval 12,212 to 12,341 feet. Gas sales commenced during June 1965, and the well had accumulated 3.041 billion cubic feet of gas and 68,000 barrels of condensate by April 1, 1966.

Production has been metered separately over the entire producing periods for both wells. From the production histories it is evident that both wells are capable of producing gas and condensate in paying quantities and are draining a horizontal area in excess of the 320-acre proration units. It is further evident that the two reservoirs can be drained effectively with existing crestal wells as proposed by the Operator in previous plans for development of the Unit. Antelope Ridge Unit No. 3, the only other penetration within the proposed revised participating areas, produced gas from both the Morrow and Atoka intervals on separate drill stem tests during drilling operations. Therefore, we propose that the boundaries as established for the Initial Participating Area for the Pennsylvanian Formation is applicable to both the Morrow and Atoka formations and respectfully request that the boundaries be approved for the newly created participating areas. It is the opinion of the operator that the participating areas as defined include all of the area that can reasonably be shown to be productive of unitized substances from the respective zones and that correlative rights will be protected as a result of this determination.

In support of this application we are submitting the following exhibits:

1. A southwest-northeast cross section of the Pennsylvanian interval showing formation correlation and well data in the zones of interest. (Exhibit No. 1)
2. A structure map contoured on top of the Atoka pay zone. The top of the Morrow formation conforms with this structural interpretation. (Exhibit No. 2)



- 3. Schedule I showing the percentage participation of each lease included in the Initial Morrow Participating Area.
- 4. Schedule II showing the percentage participation of each lease included in the Initial Atoka Participating Area.

Yours very truly,

J. E. R. Sheeler
 J. E. R. Sheeler
 Division Production Manager

APPROVE: *John A. Baker*
 ACTING Director, United States Geological Survey

DATE: SEP 9 1966

APPROVE: *Lynton B. Hays*
 Commissioner of Public Lands

DATE: 7/28/66

APPROVE: *A. H. Carter*
 New Mexico Oil Conservation Commission

DATE: July 22, 1966

RECEIVED
 SEP 19 1966
 U. S. GEOLOGICAL SURVEY
 ROSWELL, NEW MEXICO

Schedule I
Initial Participating Area
Morrow Formation - Antelope Ridge Unit
Lea County, New Mexico

Schedule Showing Percentage of Participation
and Ownership of Leases in the Participating Area

Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 07199-B (Tract 4)
Participating Acreage:	159.98 Acres
Percent of Participation:	11.11196
Description:	Section 4: Lot 1, SE/4 NE/4, S/2 SW/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 07199-C (Tract 5)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 4: E/2 SE/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 021422 (Tract 6)
Participating Acreage:	159.94 Acres
Percent of Participation:	11.10918
Description:	Section 4: Lot 2, SW/4 NE/4, W/2 SE/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Continental Oil Company
Working Interest Owner:	Continental Oil Company
Serial Number and Tract Number:	NM 045352 (Tract 7)
Participating Acreage:	40.00 Acres
Percent of Participation:	2.77833
Description:	Section 4: NW/4 SW/4, R-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	E-8078 (Tract 10)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 34: NE/4 SW/4, SW/4 SW/4, T-23-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	OG-20 (Tract 11)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 34: NW/4 SW/4, SE/4 SW/4, T-23-S, R-34-E, N.M.P.M.

Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	K-280 (Tract 12)	
Participating Acreage:	80.00 Acres	
Percent of Participation:	5.55668	
Description:	Section 33: E/2 SE/4, T-23-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	K-1124 (Tract 13)	
Participating Acreage:	39.86 Acres	
Percent of Participation:	2.76861	
Description:	Section 4: Lot 4, T-24-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	K-2149 (Tract 14)	
Participating Acreage:	240.00 Acres	
Percent of Participation:	16.67002	
Description:	Section 33: SW/4, W/2 SE/4, T-23-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	None (Tract 15)	
Participating Acreage:	320.03 Acres	
Percent of Participation:	22.22878	
Description:	Section 3: Lots 3 and 4, S/2 NW/4, SW/4, T-24-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	None (Tract 16)	
Participating Acreage:	159.90 Acres	
Percent of Participation:	11.10640	
Description:	Section 4: Lot 3, S/2 NW/4, NE/4 SW/4, T-24-S, R-34-E, N.M.P.M.	
Summary:		
	<u>Acres</u>	<u>Percent</u>
Total Federal Lands	439.92	30.55615
Total Indian Lands	0.00	0.00
Total State Lands	519.86	36.10867
Total Fee or Other Lands	<u>479.93</u>	<u>33.33518</u>
Subtotal	1439.71	100.00000
Uncommitted Acreage	<u>0.00</u>	
Total Productive Acreage	1439.71	

Schedule II
Initial Participating Area
Atoka Formation - Antelope Ridge Unit
Lea County, New Mexico

Schedule Showing the Percentage of Participation
and Ownership of Leases in the Participating Area

Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 07199-B (Tract 4)
Participating Acreage:	159.98 Acres
Percent of Participation:	11.11196
Description:	Section 4: Lot 1, SE/4 NE/4, S/2 SW/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 07199-C (Tract 5)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 4: E/2 SE/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 021422 (Tract 6)
Participating Acreage:	159.94 Acres
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Description:	Section 4: Lot 2: SW/4 NE/4, W/2 SE/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Continental Oil Company
Working Interest Owner:	Continental Oil Company
Serial Number and Tract Number:	NM 045352 (Tract 7)
Participating Acreage:	40.00 Acres
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Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	E-8078 (Tract 10)
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Percent of Participation:	5.55668
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Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	OG-20 (Tract 11)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
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Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	K-280 (Tract 12)	
Participating Acreage:	80.00 Acres	
Percent of Participation:	5.55668	
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Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	K-1124 (Tract 13)	
Participating Acreage:	39.86 Acres	
Percent of Participation:	2.76861	
Description:	Section 4: Lot 4, T-24-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	K-2149 (Tract 14)	
Participating Acreage:	240.00 Acres	
Percent of Participation:	16.67002	
Description:	Section 33: SW/4, W/2 SE/4, T-23-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	None (Tract 15)	
Participating Acreage:	320.03 Acres	
Percent of Participation:	22.22878	
Description:	Section 3: Lots 3 and 4, S/2 NW/4, SW/4, T-24-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	None (Tract 16)	
Participating Acreage:	159.90 Acres	
Percent of Participation:	11.10640	
Description:	Section 4: Lot 3, S/2 NW/4, NE/4 SW/4, T-24-S, R-34-E, N.M.P.M.	
Summary:		
	<u>Acres</u>	<u>Percent</u>
Total Federal Lands	439.92	30.55615
Total Indian Lands	0.00	0.00
Total State Lands	519.86	36.10867
Total Fee or Other Lands	<u>479.93</u>	<u>33.33518</u>
Subtotal	1439.71	100.00000
Uncommitted Acreage	<u>0.00</u>	
Total Productive Acreage:	1439.71	

July 29, 1966

Shell Oil Company
P. O. Box 1509
Midland, Texas 79704

Re: Antelope Ridge Unit
Lea County, New Mexico

ATTENTION: Mr. J. E. R. Sheeler

Gentlemen:

The Commissioner of Public Lands has approved your application dated July 15, 1966, for the separation of the Initial Participating Area for the Pennsylvanian Formation into the Atoka and Morrow Participating Areas. This separation was necessary due to the abolishment by the Oil Conservation Commission of the Antelope Ridge Morrow Pennsylvanian Gas Pool and the establishment by the New Mexico Oil Conservation Commission, Order No. 3050, of the Antelope Ridge Atoka Gas Pool and the Antelope Ridge Morrow Gas Pool.

The effective date of the separation and establishment of the Initial Participating Area for the Antelope Ridge Morrow Formation and the Initial Participating Area for the Antelope Ridge Atoka Formation, being March 1, 1966.

We are returning one approved copy of this application.

Very truly yours,

GUYTON B. HAYS
COMMISSIONER OF PUBLIC LANDS

BY:
Ted Bilberry, Director
Oil and Gas Department

Shell Oil Company
July 28, 1966
Page 2.

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 87501

United States Geological Survey
P. O. Crower 1857
Roswell, New Mexico 88201

OIL CONSERVATION COMMISSION

P. O. BOX 871
SANTA FE, NEW MEXICO

219

July 22, 1966

Shell Oil Company
P. O. Box 1509
Midland, Texas 79704

Attention: Mr. J. E. R. Sheeler

Re: Pennsylvanian Formation
Participating Area, Antelope
Ridge Unit, Lea County,
New Mexico

Gentlemen:

The New Mexico Oil Conservation Commission has this date approved your application for the separation of the Initial Participating Area Pennsylvanian Formation into the Atoka Participating Area and the Morrow Participating Area. Separation of the Initial Participating is made necessary by the separation of the Antelope Ridge-Morrow Pennsylvanian Gas Pool underlying the Participating Area into the Antelope Ridge-Morrow Gas Pool and the Antelope Ridge-Atoka Gas Pool. Both newly formed participating areas are of identical horizontal limits, the area being that established by the Initial Participating area submitted for approval October 15, 1963.

The approval of the Commission is subject to like approval by the United States Geological Survey and the Commissioner of Public Lands of the State of New Mexico.

Three approved copies of the application are returned herewith.

Very truly yours,

A. L. PORTER, Jr.,
Secretary-Director

ALP/JEK/og

cc: Commissioner of Public Lands - Santa Fe
U. S. Geological Survey - Roswell



SHELL OIL COMPANY

WESTERN DIVISION
P. O. BOX 1509
MIDLAND, TEXAS 79701

July 15, 1966

Subject: Antelope Ridge Unit (14-08-001-8492)
Lea County, New Mexico

Oil Conservation Commission
State of New Mexico
State Land Building
Santa Fe, New Mexico

MAIN OFFICE OLC

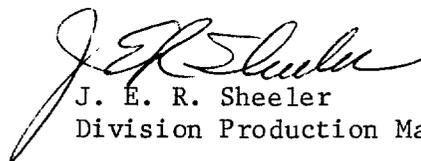
'66 JUL 18 AM 7 43

Gentlemen:

We are enclosing for your approval five copies of our Application for Separation of Initial Participating Area Pennsylvanian Formation into Initial Atoka Participating Area and Initial Morrow Participating Area. We are forwarding the same application separately to the United States Geological Survey and the Commissioner of Public Lands for their approval.

If you agree, please ratify three copies of the application (without enclosures) and return them to us for further handling.

Yours very truly,



J. E. R. Sheeler
Division Production Manager



SHELL OIL COMPANY

WESTERN DIVISION
P. O. BOX 1509
MIDLAND, TEXAS 79704

July 15, 1966

Subject: Antelope Ridge Unit (14-08-001-8492)
Lea County, New Mexico
Application for Separation of Initial Participating Area
Pennsylvanian Formation into Atoka Participating Area and
Morrow Participating Area

MAIL OFFICE 0 10
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The Director
United States Geological Survey
Washington 25, D.C.

Commissioner of Public Lands
State Land Building
Santa Fe, New Mexico

Through:
Regional Oil and Gas Supervisor
United States Geological Survey
P.O. Drawer 1857
Roswell, New Mexico

Oil Conservation Commission
State Land Building
Santa Fe, New Mexico

As originally approved, the Initial Participating Area for the Pennsylvanian Formation in the Antelope Ridge Unit was in conformance with field rules established by NMOCC Order No. 2911, effective May 24, 1965. This Order defined the vertical limits of the Antelope Ridge Morrow Pennsylvanian gas pool within the interval 11,854 feet to 13,840 feet in Antelope Ridge Unit Well No. 2 (formerly Federal BE No. 1). As shown on Exhibit No. 1, the vertical pool limits included both the Atoka and Morrow formations. The Initial Participating Area was established to include the 160-acre producing tract dedicated to Antelope Ridge Unit No. 2 and the eight contiguous quarter sections comprising the following acreage:

S/2 Section 33 and SW/4 Section 34, T-23-S, R-34-E; W/2 Section 3 and all Section 4, T-24-S, R-34-E, totaling 1439.71 acres.

By NMOCC Order No. 3050, effective March 17, 1966, the Antelope Ridge Morrow Pennsylvanian Gas Pool was abolished and the Antelope Ridge Atoka Gas Pool and the Antelope Ridge Morrow Gas Pool were established. At this time, the Atoka and Morrow Gas Pools were placed on 320-acre spacing.

Inasmuch as two separate pools have been established to replace the original Morrow Pennsylvanian Gas Pool, Shell Oil Company, as Unit Operator, hereby makes application, in accordance with Section 11 of the Unit Agreement, to separate the Initial Participating Area for the Antelope Ridge Pennsylvanian formation into two participating areas to be designated as follows:

1) Initial Participating Area for the Antelope Ridge Morrow Formation

Description: S/2 Section 33 & SW/4 Section 34, T-23-S, R-34-E;
W/2 Section 3, all Section 4, T-24-S, R-34-E.
Total acres - 1439.71 (see Schedule I)

Effective Date: April 1, 1966 (first of month following field rule change.

Vertical Limits: 12,854 to 13,840 feet in reference to Antelope Ridge Unit No. 2.

2) Initial Participating Area for the Antelope Ridge Atoka Formation

Description: Same as for Morrow Formation (see Schedule II)

Effective Date: April 1, 1966

Vertical Limits: 12,092 to 12,854 feet in reference to Antelope Ridge Unit No. 2.

Antelope Ridge Unit No. 2 (formerly Federal BE No. 1) was completed on July 20, 1963, for a calculated open flow potential of 38 million cubic feet of gas per day through perforations opposite the Morrow formation in the interval 12,898 to 13,153 feet. Gas sales commenced during January 1964, and the well had accumulated 2.921 billion cubic feet of gas and 26,000 barrels of condensate by April 1, 1966.

Antelope Ridge Unit No. 4 was completed on February 4, 1965, for a calculated open flow potential of 30 million cubic feet of gas per day through a slotted liner opposite the Atoka formation in the interval 12,212 to 12,341 feet. Gas sales commenced during June 1965, and the well had accumulated 3.041 billion cubic feet of gas and 68,000 barrels of condensate by April 1, 1966.

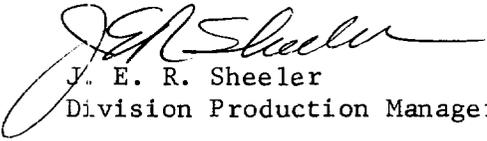
Production has been metered separately over the entire producing periods for both wells. From the production histories it is evident that both wells are capable of producing gas and condensate in paying quantities and are draining a horizontal area in excess of the 320-acre proration units. It is further evident that the two reservoirs can be drained effectively with existing crestal wells as proposed by the Operator in previous plans for development of the Unit. Antelope Ridge Unit No. 3, the only other penetration within the proposed revised participating areas, produced gas from both the Morrow and Atoka intervals on separate drill stem tests during drilling operations. Therefore, we propose that the boundaries as established for the Initial Participating Area for the Pennsylvanian Formation is applicable to both the Morrow and Atoka formations and respectfully request that the boundaries be approved for the newly created participating areas. It is the opinion of the operator that the participating areas as defined include all of the area that can reasonably be shown to be productive of unitized substances from the respective zones and that correlative rights will be protected as a result of this determination.

In support of this application we are submitting the following exhibits:

1. A southwest-northeast cross section of the Pennsylvanian interval showing formation correlation and well data in the zones of interest. (Exhibit No. 1)
2. A structure map contoured on top of the Atoka pay zone. The top of the Morrow formation conforms with this structural interpretation. (Exhibit No. 2)

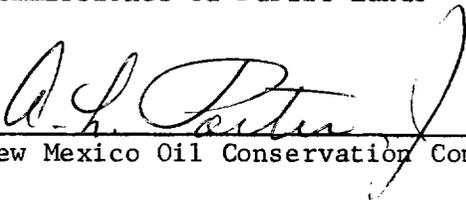
- 3. Schedule I showing the percentage participation of each lease included in the Initial Morrow Participating Area.
- 4. Schedule II showing the percentage participation of each lease included in the Initial Atoka Participating Area.

Yours very truly,


 J. E. R. Sheeler
 Division Production Manager

APPROVE: _____ DATE: _____
 Director, United States Geological Survey

APPROVE: _____ DATE: _____
 Commissioner of Public Lands

APPROVE:  _____ DATE: July 22, 1966
 New Mexico Oil Conservation Commission

Schedule I
Initial Participating Area
Morrow Formation - Antelope Ridge Unit
Lea County, New Mexico

Schedule Showing Percentage of Participation
and Ownership of Leases in the Participating Area

Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 07199-B (Tract 4)
Participating Acreage:	159.98 Acres
Percent of Participation:	11.11196
Description:	Section 4: Lot 1, SE/4 NE/4, S/2 SW/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 07199-C (Tract 5)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 4: E/2 SE/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 021422 (Tract 6)
Participating Acreage:	159.94 Acres
Percent of Participation:	11.10918
Description:	Section 4: Lot 2, SW/4 NE/4, W/2 SE/4, T-24-S, R-34-E, N.M.P.M.
Lease:	Continental Oil Company
Working Interest Owner:	Continental Oil Company
Serial Number and Tract Number:	NM 045352 (Tract 7)
Participating Acreage:	40.00 Acres
Percent of Participation:	2.77833
Description:	Section 4: NW/4 SW/4, R-24-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	E-8078 (Tract 10)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 34: NE/4 SW/4, SW/4 SW/4, T-23-S, R-34-E, N.M.P.M.
Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	OG-20 (Tract 11)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 34: NW/4 SW/4, SE/4 SW/4, T-23-S, R-34-E, N.M.P.M.

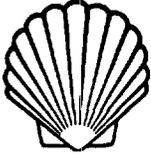
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	K-280 (Tract 12)	
Participating Acreage:	80.00 Acres	
Percent of Participation:	5.55668	
Description:	Section 33: E/2 SE/4, T-23-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	K-1124 (Tract 13)	
Participating Acreage:	39.86 Acres	
Percent of Participation:	2.76861	
Description:	Section 4: Lot 4, T-24-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	K-2149 (Tract 14)	
Participating Acreage:	240.00 Acres	
Percent of Participation:	16.67002	
Description:	Section 33: SW/4, W/2 SE/4, T-23-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	None (Tract 15)	
Participating Acreage:	320.03 Acres	
Percent of Participation:	22.22878	
Description:	Section 3: Lots 3 and 4, S/2 NW/4, SW/4, T-24-S, R-34-E, N.M.P.M.	
Lease:	Shell Oil Company	
Working Interest Owner:	Shell Oil Company	
Serial Number and Tract Number:	None (Tract 16)	
Participating Acreage:	159.90 Acres	
Percent of Participation:	11.10640	
Description:	Section 4: Lot 3, S/2 NW/4, NE/4 SW/4, T-24-S, R-34-E, N.M.P.M.	
Summary:		
	<u>Acres</u>	<u>Percent</u>
Total Federal Lands	439.92	30.55615
Total Indian Lands	0.00	0.00
Total State Lands	519.86	36.10867
Total Fee or Other Lands	<u>479.93</u>	<u>33.33518</u>
Subtotal	1439.71	100.00000
Uncommitted Acreage	<u>0.00</u>	
Total Productive Acreage	1439.71	

Schedule II
Initial Participating Area
Atoka Formation - Antelope Ridge Unit
Lea County, New Mexico

Schedule Showing the Percentage of Participation
and Ownership of Leases in the Participating Area

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Percent of Participation:	11.11196
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Lease:	Shell Oil Company
Working Interest Owner:	Shell Oil Company
Serial Number and Tract Number:	NM 07199-C (Tract 5)
Participating Acreage:	80.00 Acres
Percent of Participation:	5.55668
Description:	Section 4: E/2 SE/4, T-24-S, R-34-E, N.M.P.M.
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SHELL OIL COMPANY

WESTERN DIVISION
P. O. BOX 1509
MIDLAND, TEXAS 79704

July 15, 1966

Subject: Antelope Ridge Unit (14-08-001-8492)
Lea County, New Mexico
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Initial Participating Area
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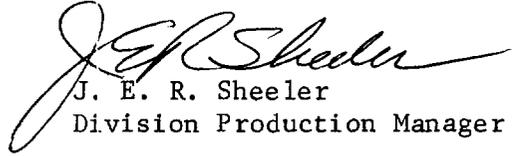
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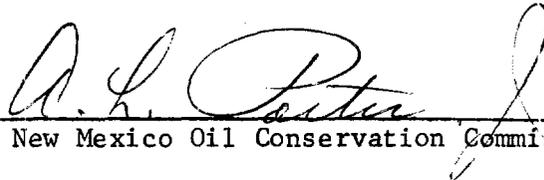
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Yours very truly,


 J. E. R. Sheeler
 Division Production Manager

APPROVE: _____ DATE: _____
 Director, United States Geological Survey

APPROVE: _____ DATE: _____
 Commissioner of Public Lands

APPROVE:  _____ DATE: July 22, 1966
 New Mexico Oil Conservation Commission