

GEOLOGIC MEMORANDUM
PROPOSED BEAR CANYON UNIT AREA
RIO ARRIBA COUNTY, NEW MEXICO

LOCATION

Amoco Production Company proposes the formation of a Federal divided type exploratory unit, henceforth referred to as the Bear Canyon Unit, in the southeastern San Juan Basin. The proposed unit will cover approximately 4,800 acres in Township 26 North, Range 2 West of Rio Arriba County, New Mexico.

INITIAL TEST

Amoco Production Company will be the unit operator and proposes to drill an exploratory well through the Cretaceous Dakota sandstone. This well is tentatively located in NE/4 Section 15, Township 26 North, Range 2 West and will serve as the initial unit obligation well. This well will be drilled to a TD of approximately 8,300 feet penetrating the entire Dakota interval.

GEOLOGY

The San Juan Basin located in northwestern New Mexico and southwestern Colorado was in a part of the Late Cretaceous epicontinental seaway where deposition was dominated by marine and deltaic sedimentation. The present-day basin was formed during the Paleocene-Eocene Laramide orogeny. Most of the production in the basin is from low permeability sandstones and sandy shales and is controlled largely by diagenetic conditions.

The proposed Bear Canyon Unit is located in the southeastern San Juan Basin west of the basin-fringing monocline. The proposed unit is east of both the Blanco Mesaverde and Basin Dakota gas fields and is north of Tapacito Pictured Cliffs gas field. The proposed unit is north of Gavilan Mancos Field and west of West Puerto Chiquito Mancos Field.

OBJECTIVES

The primary objective is the fractured sandy shales of the Gallup Producing Interval of the Cretaceous Mancos Formation. The Bear Canyon prospect is located on a south-plunging anticline located west of the steeply dipping monocline. It is anticipated that fracturing of the Gallup will be enhanced where the structure plunges and along the flanks where the radius of curvature changes. Production from the Gallup at Bear Canyon would be analogous to that at Gavilan Field, located on the southern end of a south-plunging structural nose approximately seven miles south of the proposed Bear Canyon Unit. Structure in this area has been mapped with existing well control.

Additional potential exists in the Cretaceous Dakota, Mesaverde, and Pictured Cliffs Sandstones, however, production from these zones near the proposed Bear Canyon Unit is largely uneconomic.

DRILLING ACTIVITY

The nearest Gallup penetration to the proposed unit is the Aztec Tapacitos #1 located in the NE/4, Section 16, Township 26 North, Range 2 West. This well was completed on November 11, 1972, as a Mesaverde gas producer. It was tested nonproductive in the Gallup, however, actual test results were not reported. The nearest economic Gallup production to the proposed unit is the Dugan Tapacitos #4 located approximately three miles south of Amoco's proposed unit outline.

UNIT BOUNDARIES

The boundaries of the proposed Bear Canyon Unit have been delineated based on anticipated area of maximum fracturing in the Gallup, which is defined by the mapped plunging anticline. The eastern boundary is limited by the eastern limit of the anticline and coincides with the western limit of the Canada Ojitos Unit. The southern boundary is determined by the southern extent of the plunging structural nose. The western boundary is chosen as the -700 foot structural contour (top of Graneros marker) as it approximates the western extent of the structure and therefore the western limit of fracturing. The northern boundary has been located where the structure begins to plunge to the south. Fracturing in the Gallup is

controlled by changes in the radius of curvature on these small structures, and fracturing is therefore not anticipated to the north due to the lack of plunge of the structure.

R. J. Bottjer, Geologist
Amoco Production Company

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RPT831
050186



Amoco Production Company

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303-830-4040

W. R. Francis
Division Land Manager

Case 8998

June 13, 1986

TO: The Director
Bureau of Land Management
Washington, D.C. 20025

THROUGH: District Manager
Bureau of Land Management
505 Marquett NW, Room 815
Albuquerque, New Mexico 87102

Re: Application for Designation of
Proposed Unit Area and Determination
of Depth of Test Well for the
Bear Canyon Unit Area
Rio Arriba County, New Mexico

Dear Sir:

Attached hereto is a map, marked Exhibit "A", on which the proposed Bear Canyon Unit is outlined. We request that 4,800.00 acres, more or less, of Federal and Patented lands within the outline be designated as a logical Unit Area pursuant to the unitization provisions of the Mineral Leasing Act, as amended. The proposed Unit Area of 4,800.00 acres, more or less, is composed of 1,280.00 acres (26.67%) Federal lands and 3,520.00 acres (73.33%) Patented lands.

For the lands within the proposed Unit Area, we refer you to the attached Exhibit "A", which shows, in addition to the proposed Unit boundary, the boundaries and identity of the various tracts and leases in the proposed Unit Area to the extent of our present knowledge. The serial numbers of all Federal leases within the proposed Unit are listed on Exhibit "B", hereto attached.

It is requested that a test well, drilled to a depth of 8,300 feet or to test the upper 15 feet of the Morrison formation, whichever is the lesser depth, unless commercial production in paying quantities, as defined in the Unit Agreement, is encountered at a lesser depth, be approved as the required test well.

Amoco Production Company anticipates submitting, at a later date, a standard form Unit Agreement (1983 reprint) which will deviate from the standard form as follows:

1. Section 18, Paragraph H, will be stricken in its entirety.

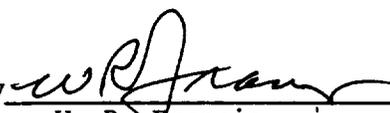
To the best of our knowledge, there are no Federal lands within the proposed Unit Area requiring the inclusion of special provisions in the Unit Agreement other than those set forth above.

In support of this Application, we are submitting separately, in duplicate, a geological report with a map showing the geologic conditions within the proposed Unit Area. It is requested that this information be held confidential.

Please transmit all correspondence regarding this Application to Edmundson & Associates, Inc., P. O. Box 1707, Denver, Colorado 80201.

Very truly yours,

AMOCO PRODUCTION COMPANY

By  _____ 
W. R. Francis
Division Land Manager

WRF:PSC:ncd
Enclosures

EXHIBIT "B"
AREA AND DEPTH APPLICATION
BEAR CANYON UNIT AREA
RIO ARRIBA COUNTY, NEW MEXICO

<u>TRACT NUMBER</u>	<u>FEDERAL SERIAL NUMBER</u>	<u>EXPIRATION DATE</u>
1	NM-7993	HBP
2	NM-13809	HBP
3	NM-19560	HBP
4	NM-28811	10-31-86
5	NM-29756	HBP
6	NM-58703	8-31-94
7	NM-62743	