

EXHIBIT "B"

SAN JUAN 32-8 UNIT
SAN JUAN COUNTY, NEW MEXICO

GEOLOGIC REPORT
DAKOTA PRODUCING INTERVAL

PROPOSED INITIAL EXPANSION OF THE
DAKOTA PARTICIPATING AREA

NORTHWEST PIPELINE CORPORATION

APPROVED BY



KENNETH J. STRACKE,
DIRECTOR
PRODUCTION DIVISION

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GENERAL INFORMATION

The San Juan 32-8 Unit is located in the north-central portion of the San Juan Basin, covering 18,289.71 acres in parts of Townships 31 and 32 North, Range 8 West. A total of 9210.57 acres was eliminated from the unit on December 8, 1962.

The Dakota Producing Interval as defined by the New Mexico Oil and Gas Commission extends from the "base of the Greenhorn Limestone to a point 400 feet below the base of said formation, consisting of the Graneros Formation, the Dakota Formation, and productive upper portion of the Morrison Formation." Within the unit area this interval has been tested in two wells, one of which is commercial (#12A) and the other is awaiting pipeline connection and commerciality determination (#11A).

In this area, the productive sands within the Dakota producing interval are restricted primarily to the Middle Dakota (Dakota "B"). This zone consists of interbedded fluvial channel sands, and coals and shales representative of a paludal (swamp) facies. The sands are lenticular and of limited areal extent. The Upper Dakota (Dakota "A") is poorly developed; the sand is thin, tight, and shaly, contributing little to the Dakota gas production. The Upper Dakota was deposited in a littoral marine environment, and probably represents a lagoonal facies.

Included in this report as Exhibit "C" are two maps (Figures 1 and 2) and a type log (Figure 3). Figure 1 shows the configuration of the subsurface structure of the Dakota interval using mean sea level as the datum plane and the top of the Graneros shale as the mapping horizon; the contour interval is 20 feet. Because of the lack of control in the north half of the unit, only the south half was mapped. Major structural features include a northward-plunging synclinal trough located along the west edge of the unit bordered by a north-to northeast-plunging anticlinal nose to the east. Regional dip is approximately 60 feet per mile N 10° E.

Figure 2 is an isopachous map contoured on the net productive Upper and Middle Dakota sands as determined from radioactive and electric logs of wells drilled within the unit and the surrounding areas. Net pay was determined using a 40-ohm resistivity cutoff and a 60-API unit gamma ray cutoff.

To illustrate nomenclature, the log of the SJU 32-8 #11A indicating formation boundaries is included as Figure 3.

Table 1 (Exhibit D) lists the monthly production, CAOF, and ID date of each well in the unit. As of July 1, 1982, the San Juan 32-8 unit has produced 85,179 MCF of gas from the Dakota Producing Interval.

PROPOSED INITIAL EXPANSION OF THE DAKOTA PARTICIPATING AREA

Effective Date: June 1, 1981
Proposed Acreage: Township 31 North, Range 8 West, NMPM
Section 21:W/2 (320 acres)
Total Acres: 320

The Initial Expansion of the Dakota Participating Area is based on log interpretation, initial test results, and seven months of production of the Northwest Pipeline Corporation San Juan 32-8 Unit well #12A. From this data it is inferred that the proposed acreage is capable of producing unitized substances in commercial quantities from the Dakota Producing Interval. The well is described as follows:

The San Juan 32-8 #12A well is located 1820 feet from the north line and 790 feet from the west line, Section 21, Township 31 North, Range 8 West, NMPM, San Juan County, New Mexico. This well was spudded on February 11, 1981 and completed on June 17, 1981. The Dakota Formation was perforated with twenty-one holes between the following depths:

7890' and 8106'

These perforations were treated with 36,700 gallons of HCL followed by a sand fracturing. The well, which has a separate tubing string for the Dakota and Mesaverde was shut-in with a SIPT of 704 psig (DK) and a SIPC of 704 psig. On June 17, 1981 the well was tested and after flowing for three hours through a 3/4 inch variable choke, the calculated AOF was 1268 MCFD.

On the basis of this well, the W/2 of Section 21 (320 acres) is recommended as the Initial Expansion of the Dakota Participating Area.