

LAGUNA SALADO SOUTH UNIT
EDDY COUNTY, NEW MEXICO

GEOLOGY

The proposed Laguna Salado South Unit will test a stratigraphic play of permeable Ramsey sands of the Bell Canyon Formation, Delaware Mountain Group. The accompanying net sand isopach map and structural cross section illustrate the play concept. The proposed exploratory test well, to be located in the NW/4 of Section 22-T23S-R29E, should top the Ramsey sand at 3,000' and penetrate over 80' of net sand ($\phi > 22\%$). Proposed total depth of the initial well will be 13,700' in the Morrow Formation.

The Ramsey sand member of the Delaware-Bell Canyon can be characterized by 2 deep water lithotypes; more massive channel sands dominated by traction deposition within channel trends and silty laminite sands dominated by suspension deposition outside the channel trends. Sands within the channel trends are slightly coarser grained and better sorted with correspondingly higher porosity and permeability than the laminite sands. The laminite sands and the overlying Lamar Limestone member of the Bell Canyon provide a permeability trap and seal for hydrocarbon accumulation within the channel sands.

Locally, the Ramsey channel sands were deposited in a northeast-southwest trend. Width of the channel trend varies from 1 to 4 miles. Sands within the trend were likely deposited as "shingle-like" lateral accretion units with

Exhibit No. 10

Case No. 9937

Hearing Date June 13, 1990

possible permeability pinchouts across the trend. Structure at the base of the Lamar Limestone reflects regional dip with structural noses over the widest parts of the sand trend. Regional dip is to the east-southeast. In this area structure may enhance, but is not a major factor in trap formation.

The Ramsey net sand map shows the possible extent of hydrocarbon accumulation. Assuming communication between sands within the channel trend, a probable reservoir spill point at -80' subsea on top of the Ramsey sand is indicated. Due to the fine grained nature of Delaware sands, thick oil-water transition zones may be present and a possible extent of commercial oil production is indicated at -180' subsea.

PREVIOUS DRILLING

To date, four wells have been drilled within the proposed unit area: three Morrow tests - Laguna Grande Unit (L.G.U.) #1, NE/4 SE/4, Section 28; L.G.U. #2, SE/4 SW/4 Section 27; L.G.U. #3, NW/4 SE/4, Section 29; and one Bone Springs test - The Blakemore Estate Federal #1, NW/4 SE/4, Section 28. None of the wells ran drill stem tests or production tests in the Ramsey sand.

The L.G.U. #1, originally completed in the Morrow in March, 1976, is now operated by Eastland Oil Company as a shut in Bone Springs oil well. The L.G.U. #2 was completed in December, 1977, as a dry hole after testing for Morrow and Wolfcamp gas. The L.G.U. #3, completed in January, 1981, is currently a producing Atoka gas well. The Blakemore Estate Federal #1 was dry and abandoned in May, 1984, after testing water with a trace of oil in the Delaware-Brushy Canyon. As shown on the accompanying cross section all 4 wells have fair to good porosity development in the Ramsey sand.

Additionally, the L.G.U. #1 and L.G.U. #3 had trace and fair mudlog shows respectively. The Blakemore #1 did not have a show in the Ramsey, and a mudlog was not run on the L.G.U. #2.

UNIT BOUNDARIES

Boundaries of the proposed 7040 acre Laguna Salado South Unit are based on geologic consideration of the primary objective-the Delaware Ramsey sands, the recognized limits of adjacent Nash Draw and Laguna Grande Units, and potentially successful tests of deeper secondary objectives. As illustrated on the net sand isopach map, the western boundary for the proposed Unit is based on the probable updip (northwestward) extent of relatively thick (>20 net feet), permeable Ramsey sands at the widest portion of the channel trend, with the northern and southern boundaries conforming to the narrowing of the trend. An exemption of the E/2 of Section 29 from the proposed Unit reflects its current inclusion in Laguna Grande Unit, a contracted Federal Exploratory Unit, that had the Morrow as its primary objective. Note that Delaware potential exists outside (to the west) of the 20' net sand contour line, but is less prospective due to thinning reservoir-zero feet thick at the Ramsey's stratigraphic pinchout. The eastern boundary conforms to the downdip limit of possible commercial production. At the northeastern corner of the proposed Unit, the east line of Sections 10 (S/2) and 15 and the north line of Section 23 coincide with the boundary of the existing Nash Draw Unit. Although the Ramsey reservoir, which would be assigned 40-acre proration units, is the primary objective; Unit boundaries conform to 320-acre proration units because the proposed Unit includes all depths/formations. The 320-acre proration units will be necessary should secondary objectives of the Atoka and/or Morrow Formations prove productive in the exploratory test well and/or development wells. Note, however, that all acreage within the proposed Unit boundaries is prospective in the Ramsey sand.

SUMMARY

The Laguna Salado South Unit is a high-risk, stratigraphic prospect with the downdip productive limits difficult to define. However, regional geologic factors, well control, and mudlog shows on previously drilled wells offer encouragement that porous-permeable sands are present and production can be established.

JRB 4/87

Revised JMK 5/90

BETTIS BROTHERS, INC.

500 W. Wall, Suite 312
Midland, Texas 79701
915/685-4128

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9937

January 25, 1988

Oil Conservation Division
State of New Mexico
P. O. Box 2088
Santa Fe, New Mexico 87504-2088

Re: Laguna Salado South Unit
3180 (065)

Gentlemen:

Please be advised that Bettis Brothers, Inc. elects not to join the above captioned unit and hereby request the exclusion of the following tracts from said unit.

1. NM-67103; T-23-S, R-29-E, N.M.P.M.
Section 28: E/2 of the E/2, 160 ac.
2. T-23-S, R-29-E, Section 21: W/2, NE/4,
N/2 of the SE/4, 560 ac.
3. T-23-S, R-29-E; Section 15: NW/4 of the
NW/4, 40 ac.

Thank you for your assistance if this matter.

Yours truly,

John D. Bettis

John D. Bettis

JDB/db

State of New Mexico



W.R. HUMPHRIES
COMMISSIONER



SLO REF NO. 06-582

Commissioner of Public Lands

P.O. BOX 1148
SANTA FE, NEW MEXICO 87504-1148

November 20, 1987

Exxon Company, U.S.A.
ATTN: Ms. Martha A. Radke
P. O. Box 1600
Midland, Texas 79702-1600

9937

Re: Proposed Laguna Salado South Unit
Eddy County, New Mexico

Gentlemen:

This office has reviewed the unexecuted copy of unit agreement for the proposed Laguna Salado South Unit area, Eddy County, New Mexico. This agreement meets the general requirements of the Commissioner of Public Lands and has this date granted you preliminary approval as to form and content.

Preliminary approval shall not be construed to mean final approval of this agreement in any way and will not extend any short term leases, until final approval and an effective date have been given. Also, any well commenced prior to the effective date of this agreement which penetrates its objective horizon prior to said effective date shall not be construed as the initial test well.

When submitting your agreement for final approval please submit the following:

1. Application for formal approval by the Commissioner setting forth the tracts that have been committed and the tracts that have not been committed.
2. All ratifications from the lessees of Record and Working Interest Owners. All signatures should be acknowledged by a notary and one set must contain original signatures.
3. Order of the New Mexico Oil Conservation Division and the Designation from the Bureau of Land Management. Our approval will be conditioned upon subsequent favorable approval by the New Mexico Oil Conservation Division and the Bureau of Land Management.

Exxon Company U.S.A.

November 20, 1987

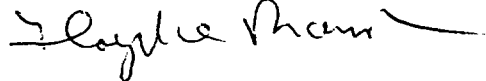
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4. One original and two copies of the Unit Agreement, and one copy of the Operating Agreement.
5. The filing fee for a unit agreement is thirty dollars per section or partial section thereof. Please submit a filing fee in the amount of \$390.00.
6. Copies of all well records pertaining to the initial test well.

If we may be of further help please do not hesitate to call on us.

Very truly yours,

W. R. HUMPHRIES
COMMISSIONER OF PUBLIC LANDS

BY: 

FLOYD O. PRANDO, Director
Oil and Gas Division
(505) 827-5744

WRH/FOP/pm

cc: OGD-Santa Fe, New Mexico
BLM-Roswell, New Mexico