GEOLOGICAL REPORT

PROPOSED GETTY DEEP UNIT

EDDY COUNTY, NEW MEXICO

ODESSA NATURAL GASOLINE COMPANY

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INTRODUCTION

The purpose of this report is to point out and describe the many excellent reservoir possibilities which are believed to exist in the Permian and pre-Permian sediments underlying the proposed Getty Deep Unit. The structural and stratigraphic aspects that characterize the prospecting area greatly enhance the reservoir potential of the proposed unit.

LOCATION

The proposed Getty Deep Unit, outlined in red on Plate I, is located in Township 20 South, Range 29 East, Eddy County, New Mexico and lies approximately 15 miles northeast of the town of Carlsbad, New Mexico. The unit is readily accessible by automobile as it underlies the Getty Field which is located approximately two miles to the north of U. S. Highway 180. U. S. Highway 180 connects the towns of Hobbs and Carlsbad, New Mexico. The Getty Field presently produces oil from the Yates formation of the Upper Guadalupian Series of the Permian System.

The Getty #7-A Dooley, the deepest well in the Getty Field, was drilled to a total depth of 6683'. Failing to find commercial production in either the Delaware Mountain Group or the upper portion of the Bone Springs formation, the well was plugged back to 1430' and completed from the Yates formation. At the time it was drilled, the Getty #7-A Dooley was the deepest well in Eddy County, New Mexico.

PROPOSED UNIT AREA

The Getty Deep Unit, as proposed, contains 1,680 acres and is described as follows:

T-20-S, R-29-E

Section 13	SW/4, W/2 SE/4
Section 14	SE/4
Section 23	E/2, E/2 NW/4
Section 24	W/2, NE/4, W/2 SE/4
Section 25	NW/4
Section 26	NE/4

It is requested that the forementioned acreage outlined in red on Plate II be unitized for the drilling of a 13,200' Devonian test The boundaries of the proposed unit were selected on the basis of a prominent Yates anomaly which is believed to be the shallow expression of a deeper structure.

SUMMARY AND CONCLUSIONS

The Odessa Natural Gaso. Company's desire to form the Getty Deep Unit is based on the theory that many of the Yates anomalies in this area are, in reality, the shallow expression of deeper structures.

The Getty Field, as indicated by the Yates structural contour map, Plate III, is located on a very prominent closed Yates anomaly. It is believed that this anomaly, when projected into the pre-Permian sediments, is of sufficient magnitude to warrant the drilling of a 13,200' exploratory well to test the Permian and pre-Permian sediments down to and including those of the Devonian System.

The proposed Getty Deep Unit, because of its marginal position between the Carlsbad Shelf and Delaware Basin will be characterized by both structural and stratigraphic traps. Although the sands of the Atoka-Morrow Series of the Pennsylvanian System are primarily blanket type deposits, they are characterized by numerous facies changes and localized porosity development.

STRATIGRAPHY

The following is a generalized description of the stratigraphic sequence in the general vicinity of the proposed Getty Deep Unit. The section is described through the Devonian System as the proposed well terminates within this system.

GENERALIZED STRATIGRAPHIC COLUMN

PROPOSED GETTY DEEP UNIT

EDDY COUNTY, NEW MEXICO

SYSTEM	SERIES	FORMATION	LITHOLOGY	INTERVAL & THICKNESS
QUATERNARY	RECENT		Caliche, Mescalero Sands, Stream gravels	0'-40' (40')
TRIASSIC	OCHOA	Dockum	Dark red shales & clays with thin gypsum beds & gray sandstone	40'-110' (70')
PERMIAN	GUADALUPE	Dewey Lake	Red sandstone, shale & siltstone	
		Rustler	Anhydrite, dolomite, red shale & sandstone	110'-365' (255')
		Salado	Salt, anhydrite, potash salts, thin beds of red shale & sand	365'-985' (620')
		Tansill	Anhydrite, silt, interbedded with dolomite & siltstone	985'-1155' (170')
		Yates	Sandstone with frosted quartz grains, dolomitic reefs, dolomite & red shaley sandstone	1155'-1380' (225')
		Seven Rivers	Dolomite, anhydrite & interbedded sandstone	1380'-1470' (90')

SYSTEM	SERIES	FORMATION	LITHOLOGY	INTERVAL & THICKNESS
PERMIAN	Guadalupe	Carlsbad & Goat Seep Reef	Dolomitic limestone interbedded with brown sandstone	1470'-3415' (1945')
		Delaware Mountain Group	Sandstone interbedded with limestone & shale	3415'-5570' (2155')
	Leonard	Bone Springs	Limestone interbedded with sandstone, shale & chert	5570'-7530' (3960')
	Wolfcamp		Limestone interbedded with dolomite, shale & chert	9530'-10350'(820')
		UNCONFORMITY		
PENNSYLVANIAN	Cisco	Cisco Reef	Gray-tan limestone	10350'-10500'(150')
	Canyon		Gray & black shale	10500'-10710'(210')
	Strawn		Predominately reef limestone interbedded with gray shale & sandstone	10710'-10960'(250')
	Atoka		Gray & black shale interbedded with limestone & sandstone	10960'-11210'(250')
	Morrow		Limestone, gray & black sandstone	11210'-11910'(700')

SYSTEM	SERIES	FORMATION	LITHOLOGY	INTERVAL & THICKNESS
MISSISSIPPIAN	Chester	"Upper Mississippian Lime"	Limestone, gray & black shale	11910'-12120' (210')
		Barnett	Black shale	12120'-12300' (180')
	Meramec & Osage	"Mississippian Lime"	Limestone interbedded with chert	12300'-12790' (490')
	Kinderhook	Woodford	Gray, black, brown shale	12790'-12860' (70')
DEVONIAN			White & tan dolomite interbedded with pink & white chert	12860'-13095' (235')

QUARTERNARY AND TRIASSIC SYSTEMS

Subsurface studies in the Getty Deep area indicate that the surface sands and caliche, Quaternary System, are underlain by approximately 70' of red shale and sand of the Dockum Group of Triassic age. There is a possibility that a portion of the forementioned red shale and sand may be the Dewey Lake redbeds of Permian age.

PERMIAN SYSTEM

Rustler Formation

The redbeds, in the Getty Deep area are underlain by approximately 255' of anhydrite, dolomite, limestone, salt and stringers of red shale and sandstone of the Rustler formation.

Salado Formation

The Salado formation, commonly refered to as the salt section, is composed of salt, anhydrite, potash salts and stringers of red shale and sand. The Salado will be approximately 620' thick.

Tansill Formation

The Tansill formation will be composed of approximately 170' of dolomite, anhydrite and interbedded siltstone.

Yates Formation

The Yates formation in the prospecting area attains a maximum thickness of approximately 225'; and is composed of gray fine grained sandstone with frosted quartz grains, dolomite reefs, anhydrite and red and gray shale.

Seven Rivers

The Seven Rivers formation is predominately a white to tan dolomite interbedded with anhydrite and gray-white fine grained sandstone. The Seven Rivers will be approximately 90' thick.

Carlsbad Limestone and Goat Seep Reef Formations

The Queen, Grayburg and San Andres formations of the Shelf environment will be replaced by the more basinward Carlsbad and Goat Seep facies. The Carlsbad and Goat Seep facies will consist of approximately 1945' of dolomite and dolomitic limestone interbedded with brown sandstone.

Delaware Mountain Group

The Delaware Mountain Group in the prospecting area is predominately a fine, gray to brown sandstone interbedded with dense tan and brown, finely crystalline dolomite. The Delaware Mountain Group should be approximately 2155' thick.

Bone Springs Formation

The Bone Springs formation will be approximately 3960' thick and will be a tan and brown finely crystalline limestone interbedded with gray fine grained sandstone, gray and brown shale and tan to brown finely crystalline dolomite.

Wolfcamp Series

The Wolfcamp Series will be characterized by tan and brown limestone and dolomite interbedded with gray and brown shale. The approximate thickness of the Wolfcamp Series will be 820'.

PENNSYLVANIAN SYSTEM

Cisco-Canyon Series

The Cisco-Canyon Series will be approximately 360' thick and will be composed of tan and brown limestone and gray and black shale. It is anticipated that the Cisco Series will be represented by a limestone reef with a maximum thickness of 150'. The Canyon Series will be represented by approximately 210' of gray and black shale.

Strawn Series

The Strawn Series will be a tan to brown, dense to medium crystalline, fractured limestone interbedded with gray and black shale. It is anticipated that the Strawn Series will be represented by a reef development, and will attain a

maximum thickness of approximately 250'.

Atoka Series

The Atoka Series will be predominately a gray to black shale interbedded with sandstone and limestone. The estimated thickness of the Atoka Series is 250'.

Morrow Series

The Morrow Series will be approximately 730' thick in the proposed unit area. The Upper 250' will be a tan to brown fine crystalline limestone interbedded with gray and black shale. The lower 480' will be alternating sand and shale sections. The shale will be gray and black, and the sands will be composed of medium to coarse, sub-round quartz grains.

MISSISSIPPIAN SYSTEM

Chester Series

"Upper Mississippian Lime"
Barnett Formation

The Chester Series attains a maximum thickness of 390' in the prospecting area, and is subdivided into the "Upper Mississippian Lime" and the Barnett Shale. The "Upper Mississippian Lime" is a tan to brown ine crystalline limestone and will be approximately 210' thick. The Barnett shale is predominately black in color and will be approximately 180' thick.

Meramec and Osage Series

"Mississippian Lime"

The Meramec and Osage Series will be represented by approximately 490' of tan to brown crystalline limestone interbedded with gray and brown chert. The Meramec and Osage Series are commonly refered to as the "Mississippian Lime".

Kinderhook Series

Woodford Formation

The Woodford formation, a gray, black and brown shale, will attain a maximum thickness of approximately 70' in the prospecting area.

DEVONIAN SYSTEM

The Devonian System will be represented by approximately 235' of medium to coarse crystalline dolomite interbedded with gray, brown and smoky chert.

GEOLOGICAL AND STRUCTURAL CONDITIONS PERTINENT TO THE PROPOSED GETTY DEEP UNIT

In areas of sparse well control, such as the proposed Getty Deep Unit, an accurate subsurface interpretation of the deeper horizons is practically impossible. It has been noted throughout this area that the majority of the Yates anomalies are actually reflecting deeper structural features. The El Paso Lusk Deep Unit, the Pan American Greenwood Unit and the Ohio Lea Unit Federal have one point in common, each was drilled on a Yates anomaly. The Lusk Deep Unit is presently producing oil from the Strawn formation and gas and distillate from the Morrow formation. The Greenwood Unit produces oil from the Bone Springs and gas and distillate from the Morrow and Devonian formations. The Lea Unit is presently producing oil from the Bone Springs and Devonian formations and gas and distillate from the Morrow formation.

It is believed that the Yates anomaly of the Getty Field is also a shallow expression of a deep seated structure. The structural and stratigraphic relationships of the proposed Getty Deep Unit, as interpretated by Odessa Natural Gasoline Company, have been illustrated by Cross-Section A-A' (Plate IV).

The prospecting area is located on the hingeline of the Delaware Basin and the Carlsbad Shelf; consequently the significant structural and stratigraphic features are the results of two major orogenies, the Marathon and the Laramide. The environmental conditions along the marginal area between the basin and shelf were conducive to the growth and development of organic reefs. Reefing is anticipated in the Cisco and Strawn Series of the Pennsylvanian System and the Guadalupe Series of the Permian System.

The downwarping of the Delaware Basin was initiated during the Pennsylvanian Period by the Marathon Orogeny, and continued throughout the Pennsylvanian and Permian Periods. The Pennsylvanian and Permian stratigraphy of the prospecting area was greatly influenced by the continual downwarping of the Delaware Basin, and will be characteized by numerous facies changes.

The Delaware Basin and Carlsbad Shelf assumed their present structural attitude near the end of the Cretaceous Period as a result of the Laramide Orogeny. Although the Pre-Pennsylvanian sediments were subjected to both orogenies, it is reasonable to assume that the present structures are primarily the results of the Laramide. If this is the case, then the Yates and older sediments were folded simultaneously, and the Yates anomaly of the Getty Field is, in fact, an indicator of deeper structure.

POSSIBLE PRODUCTIVE FORMATIONS

A test well drilled in the SW/4 of the SW/4 of Section 24, Township 20 South, Range 29 East, should encounter excellent reservoir conditions throughout the Permian and pre-Permian sediments.

The first major reservoir to be encountered will be the porous carbonates of the Wolfcamp Series (9530-10350) of the Permian System. The organic reefs of the Cisco Series (10350-10500) and the Strawn Series (10710-10960) of the Pennsylvanian System are characteristically very prolific reservoirs. The Lower Pennsylvanian System, being the Atoka-Morrow Series (10960-11910), is known to contain numerous sandstone reservoirs. Many wells throughout this general area are presently producing large quantities of gas and distillate from the porous sand zones of the Atoka-Morrow Series.

The Devonian System (12860-13095) produces both oil and gas throughout Southeastern New Mexico. The porous Devonian dolomite is characteristically a very prolific reservoir.

It is therefore recommended that the Getty Deep Unit be approved, as proposed, for the drilling of a test well to a depth of approximately 13,200' sufficient to test the Devonian formation.