Play Analysis and Digital Portfolio of Major Oil Reservoirs in the Permian Basin: Application and Transfer of Advanced Geological and Engineering Technologies for Incremental Production Opportunities

Annual Report

Reporting Period Start Date: January 14, 2002

Reporting Period End Date: January 13, 2003

Shirley P. Dutton, Eugene M. Kim, Ronald F. Broadhead, William Raatz, Cari Breton, Stephen C. Ruppel, Charles Kerans, and Mark H. Holtz

April 2003

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Abstract

A play portfolio is being constructed for the Permian Basin in west Texas and southeast New Mexico, the largest petroleum-producing basin in the United States. Approximately 1,300 reservoirs in the Permian Basin have been identified as having cumulative production greater than 1 MMbbl of oil through 2000. Of these major reservoirs, approximately 1,000 are in Texas and 300 in New Mexico. On a preliminary basis, 32 geologic plays have been defined for Permian Basin oil reservoirs and assignment of each of the 1,300 major reservoirs to a play has begun. The reservoirs are being mapped and compiled in a Geographic Information System (GIS) by play.

Detailed studies of three reservoirs are in progress: Kelly-Snyder (SACROC unit) in the Pennsylvanian and Lower Permian Horseshoe Atoll Carbonate play, Fullerton in the Leonardian Restricted Platform Carbonate play, and Barnhart (Ellenburger) in the Ellenburger Selectively Dolomitized Ramp Carbonate play. For each of these detailed reservoir studies, technologies for further, economically viable exploitation are being investigated.

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Introduction

This 2-year PUMP project, now well under way, has made significant progress toward all goals and objectives. This report describes the work accomplished on the project during the first year.

The target of the project is the Permian Basin of west Texas and southeast New Mexico (fig. 1), the largest petroleum-producing basin in the United States. The Permian Basin produced 18 percent of the total U.S. oil production in 1999, and it contains an estimated 23 percent of the proved oil reserves in the United States (EIA, 2000). Moreover, this region has the biggest potential for additional oil production in the country, containing 29 percent of estimated future oil reserve growth (Root and others, 1995). More than in any other region, increased use of preferred management practices in Permian Basin oil fields will have a substantial impact on domestic production.

Production in the Permian Basin occurs from Paleozoic reservoirs, from Ordovician through Permian (fig. 2). Original oil in place (OOIP) in the Texas part of the basin alone was about 106 billion barrels (Bbbl) of oil (EIA, 2000). After reaching a peak production of more than 665 million barrels (MMbbl) per year in the early 1970's, Permian Basin oil production has continuously fallen. By 1999, production had fallen to less than 300 MMbbl, or half its peak production. Despite the continuing fall in production, the Permian Basin still holds a significant volume of oil. Although about 30 Bbbl of oil has been produced to date, this production represents only about 28 percent of the OOIP. Of the huge remaining resource in the basin, as much as 30 Bbbl of mobile oil remains as a target for improved technology and recovery strategies (Tyler and Banta, 1989).

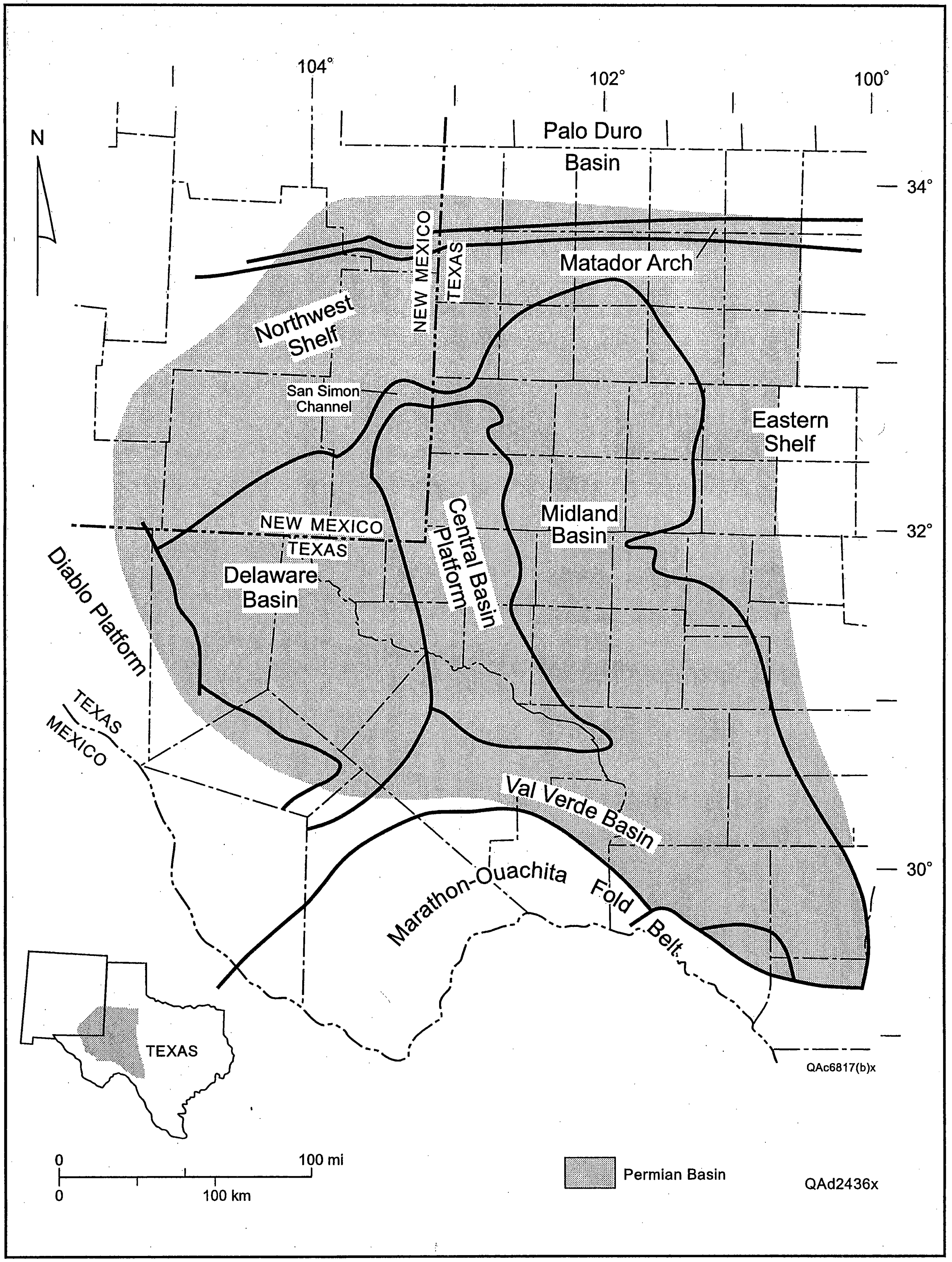

FIGURE 1. Major subdivisions and boundaries of the Permian Basin in west Texas and southeast New Mexico (modified from Hills, 1984; Frenzel and others, 1988). The Permian Basin is subdivided into the Northwest Shelf, Delaware Basin, Central Basin Platform, Midland Basin, Val Verde Basin, and Eastern Shelf.

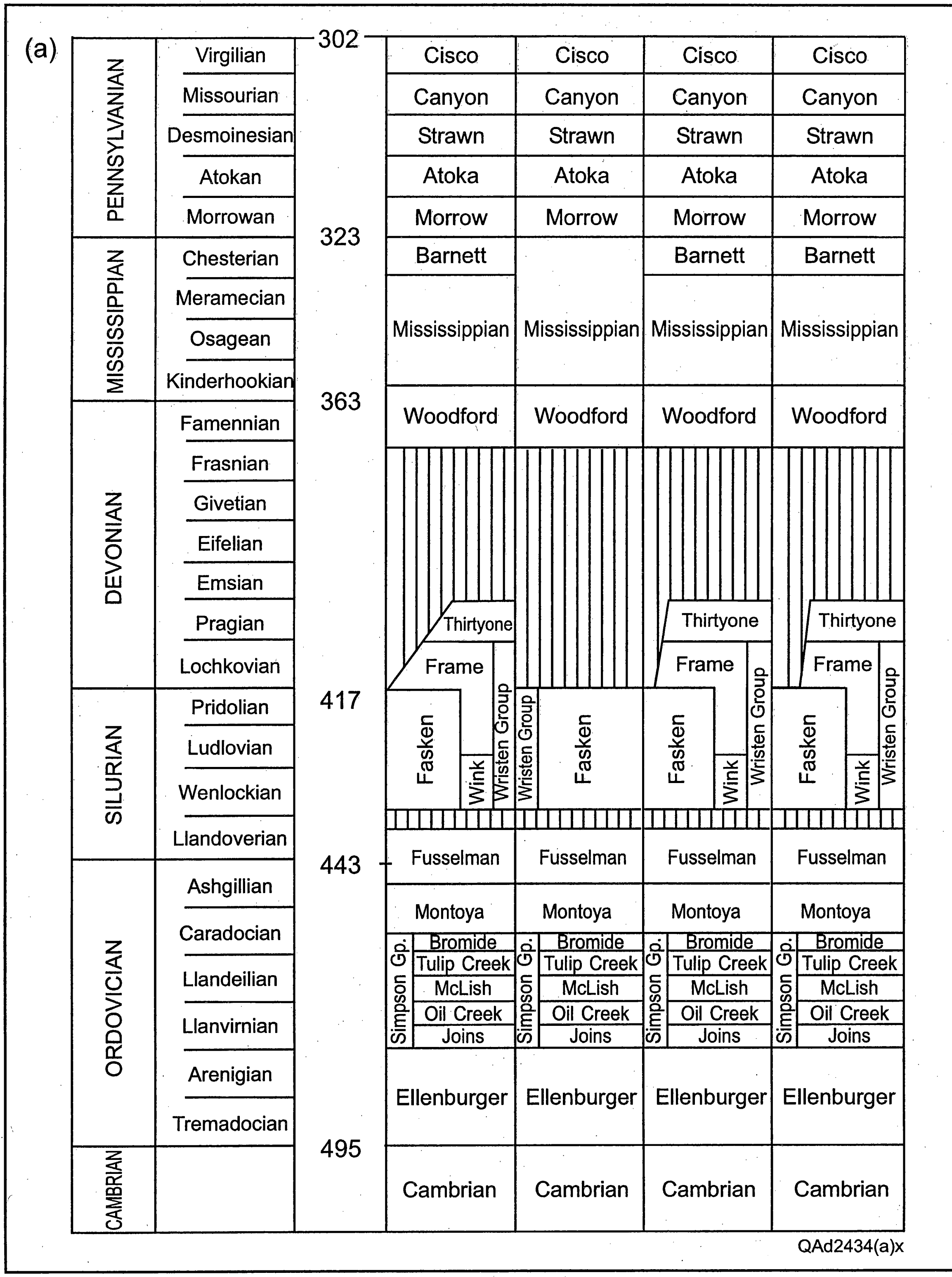

FIGURE 2a. Stratigraphic nomenclature for the Cambrian through Pennsylvanian section in the Permian Basin. From S. C. Ruppel, personal communication, 2003.

(b)

System	Epoch/ Series/ Stage	Time (m.y.)	Delaware Basin (W–E)	NW Shelf (W–E)	CBP (N–S)	Midland Basin (N–S)
PERMIAN	Ochoan	251	Dewey Lake	Dewey Lake	Dewey Lake	Dewey Lake
			Rustler	Rustler	Rustler	Rustler
			Salado	Salado	Salado	Salado
			Castile	Castile		
	Guadalupian		Delaware Mountain Group: Bell Canyon	Artesia Gp.: Tansill	Capitan: Tansill	Tansill
				Yates	Yates	Yates
				Seven Rivers	Seven Rivers	Seven Rivers
				Queen	Queen	Queen
			Cherry Canyon	Grayburg	Grayburg	Grayburg
				Upper San Andres	Upper San Andres	San Andres
			Brushy Canyon			
				Lower San Andres	Lower San Andres	
	Leonardian		Bone Spring	Glorieta	Glorieta	Spraberry
				Clear Fork Group: Upper Clear Fork	Clear Fork Group: Upper Clear Fork	
					Middle Clear Fork	
				Tubb	Tubb	Dean
				Lower Clear Fork	Lower Clear Fork	
				Abo/Wichita	Abo/Wichita	
	Wolfcampian		Wolfcamp	Wolfcamp	Wolfcamp	Wolfcamp

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FIGURE 2b. Stratigraphic nomenclature for the Permian section in the Permian Basin. From S. C. Ruppel, personal communication, 2003.

The Permian Basin is a mature area in which much of the future production will result from improved recovery from existing fields. One way of increasing recovery in a reservoir is to apply methods that have been used successfully in similar reservoirs. In order to do so, however, it is necessary to understand how reservoirs group naturally into larger families, or plays. A *play* is an assemblage of geologically similar reservoirs exhibiting the same source, reservoir, and trap characteristics (White, 1980). Plays are delineated primarily according to the original depositional setting of the reservoirs or, less commonly, their relation to regional erosional surfaces or diagenetic facies (Galloway and others, 1983). Because of their relative geologic homogeneity, reservoirs in the same play have similar production characteristics. Characteristics of better known fields may be extrapolated with relative confidence to other reservoirs within the same play. Reservoir development methods that have been demonstrated to work well in one reservoir should be applicable to other reservoirs in the play.

The Bureau of Economic Geology (BEG) and the New Mexico Bureau of Geology and Mineral Resources (NMBGMR) have teamed up to conduct this play analysis of the Permian Basin. The objectives of the project are to (1) develop an up-to-date portfolio of oil plays in the Permian Basin of West Texas and southeast New Mexico, (2) study key reservoirs from some of the largest or most active plays to incorporate information on improved practices in reservoir development in the portfolio, and (3) widely disseminate the play portfolio to the public via CD, the Internet, and other media. The oil-play portfolio will contain play maps that locate all reservoirs in the play having a cumulative production of >1 MMbbl through December 31, 2000. Play maps will be linked to a database listing cumulative production and other reservoir information. The portfolio will also include a summary description of each play, including key reservoir characteristics and preferred management practices, where possible.

Reservoir-characterization studies of key reservoirs from three of the largest and most active plays in the Permian Basin are being conducted as part of this project. The reservoirs being studied are Kelly-Snyder (SACROC unit) in the Pennsylvanian and Lower Permian Horseshoe Atoll Carbonate play, Fullerton in the Leonardian Restricted Platform Carbonate play, and Barnhart (Ellenburger) in the Ellenburger Selectively Dolomitized Ramp Carbonate play. The geologic heterogeneity in these reservoirs is being investigated in order that production constraints that would apply to all reservoirs in that play become better understood. For each of these detailed reservoir studies, technologies for further, economically viable exploitation are being investigated. The information on improved practices in reservoir development will be incorporated into the portfolio.

A project Web site has been established on the BEG Web site at http://www.beg.utexas.edu/resprog/permianbasin/index.htm. A link to the project Web site has been established at the NMBGMR Web site, from http://geoinfo.nmt.edu/resources/petroleum/home.html.

Executive Summary

The target of this PUMP project is the Permian Basin of West Texas and southeast New Mexico, the largest petroleum-producing basin in the United States. More than in any other region, increased use of preferred management practices in Permian Basin oil fields will have a substantial impact on domestic production. The Bureau of Economic Geology (BEG) and the New Mexico Bureau of Geology and Mineral Resources (NMBGMR) have teamed up to conduct this play analysis of the Permian Basin. The objectives of the project are to (1) develop an up-to-date portfolio of oil plays in the Permian Basin of West Texas and southeast New Mexico, (2) study key reservoirs from some of the largest or most active plays to incorporate information on improved practices in reservoir development in the portfolio, and (3) widely disseminate the play portfolio to the public via CD, the Internet, and other media. The oil-play portfolio will contain play maps that locate all reservoirs in the play having cumulative production of >1 MMbbl. Play maps will be linked to a database listing cumulative production and other reservoir information. The portfolio will also include a summary description of each play, including key reservoir characteristics and preferred management practices, where possible.

During the first year of the project, all reservoirs in the Permian Basin having cumulative production >1 MMbbl of oil were identified, and cumulative production through December 31, 2000, was determined. A total of about 1,000 reservoirs in Texas and 300 reservoirs in New Mexico had produced >1 MMbbl of oil through 2000. A reservoir database was established that lists the Railroad Commission of Texas (RRC) reservoir number and district (Texas only), official field and reservoir name, year the reservoir was discovered, depth to the top of the reservoir, and cumulative production through 2000. In Texas, cumulative production is listed only under the final reservoir name into which one or more other reservoirs had been transferred.

Thirty-two plays covering both the Texas and New Mexico parts of the Permian Basin were defined, although there may be further refinement of these plays next year. Plays were defined on the basis of structural and tectonic setting, reservoir stratigraphy, reservoir lithology, depositional environment of the reservoir, and fluid type. Gas plays are not included in this project. Each of the 1,300 reservoirs having >1 MMbbl cumulative oil production has been tentatively assigned to a play. For several reservoirs, questions remain about the play assignments, so some of these designations may change during the coming year as more information about the reservoirs is acquired.

Mapping and compilation of the 1,300 major oil reservoirs in the Permian Basin began this year. Different procedures are being used for reservoirs in Texas and New Mexico because of the different data available in each state. In both states, the mapping of the reservoir outlines is being done by play in ArcView™GIS. The final reservoir shapefile for each play contains the geographic location of each reservoir and all associated reservoir information within the linked dBASE data table. The final GIS product of this process will be an ArcView project file containing the base map, the newly created series of play-specific reservoir shapefiles, and the play-boundary shapefile.

Reservoir-characterization studies of key reservoirs from three of the largest or most active plays in the Permian Basin are being conducted. Detailed studies of the following reservoirs are in progress: Kelly-Snyder (SACROC unit) in the Pennsylvanian and Lower Permian Horseshoe Atoll Carbonate play, Fullerton in the Leonardian Restricted Platform Carbonate play, and Barnhart (Ellenburger) in the Ellenburger Selectively Dolomitized Ramp Carbonate play. In the SACROC unit, large volumes of the platform carbonate previously modeled as layer cake can be shown to consist of erosionally generated slope wedges associated with major eustatic sea-level falls. Complex promontories and reentrants mark the edges of the field, and large windward-leeward asymmetries control reservoir-quality distribution. A 3-D reservoir model developed for the unit using 3-D seismic and wireline data should greatly aid ongoing efforts for enhanced recovery in this reservoir using the WAG [water alternating gas (CO_2)] process.

The effectiveness of high-pressure air injection (HPAI) technology is being tested in the Barnhart Ellenburger reservoir. Characterization of the reservoir architecture at Barnhart field is critical because of the complexity of the fractured and karsted Ellenburger Group carbonates that compose the reservoir. The distribution of karst features and the distribution, abundance, and orientation of natural fractures and their impact on high-pressure air injection are being studied.

The goal of the Fullerton study is to develop techniques for improving the resolution and predictability of key reservoir properties leading to the construction of more accurate reservoir models for simulation and exploitation. Integration of cycle-stratigraphic, rock-property, and 3-D seismic data is being conducted and will provide a basis for predicting the distribution of reservoir rock and fluid properties that is more robust than is currently obtainable from more conventional methodologies.

Experimental Methods

No experimental methods or equipment is being used for this study. Information is obtained from published and publicly available sources and from commercially available databases. Reservoir locations in Texas are derived from producing-well location information in Landmark Graphic's Datastar™and DrillingInfo.com, Inc. The ArcView™GIS software package is used for mapping the reservoirs.

Results and Discussion

Definition of the Permian Basin

In order for plays in the Permian Basin to be defined, it was necessary to determine the basin boundaries. The Permian Basin in southeast New Mexico is subdivided into the Delaware Basin, Central Basin Platform, and Northwest Shelf (fig. 1). On the south and east, the New Mexico part of the basin is continuous with the Texas part of the basin. On the west, the basin is bounded by the Guadalupe, Sacramento, Sierra Blanca, and Capitan Mountains. To the north, the Permian Basin is bounded by the Sin Nombre Arch of DeBaca County and the Roosevelt Uplift of Roosevelt County.

The Permian Basin in Texas is subdivided into the Delaware Basin, Central Basin Platform, Midland Basin, Northwest Shelf, Eastern Shelf, and Val Verde Basin (fig. 1). The Matador Arch forms the northern boundary and separates the Midland Basin from the Palo Duro Basin (fig. 1). The southern boundary is the Marathon-Ouachita Fold Belt, and the western boundary is formed by the Diablo Platform. The eastern boundary is more difficult to define. Reservoirs on the Eastern Shelf of the Midland Basin are traditionally considered to be in the Permian Basin geologic province (Galloway and others, 1983). The Eastern Shelf, however, grades eastward onto the Concho Platform and Bend Arch in the North-Central Texas geologic province, with no clearly defined eastern limit. For this study, the eastern boundary of the Permian Basin was selected to follow the approximate position of the shelf edge during Wolfcampian (Camp Colorado Limestone) time (Brown and others, 1987). The counties that occur in the Permian Basin are shown in figure 3. This definition of the Permian Basin is very similar to that of Hills (1984).

The current structural features of the Permian Basin (fig. 1) developed during Late Mississippian and Early Pennsylvanian time (Hills, 1984; Frenzel and others, 1988). Prior to this time, a shallow basin called the Tobosa Basin (Galley, 1958) existed in this area.

Some plays extend from the Permian Basin east into North Central Texas. So that truncating plays can be avoided, those that occur mainly in the Permian Basin will be presented in their entirety, even if some of the reservoirs on the east side of the play actually occur in counties in the North Central Texas geologic province. Plays that occur mainly in North-Central Texas are not included in this project, even if a few of the reservoirs within the play are in the Permian Basin. However, so that cumulative production for the Permian Basin can be totaled, reservoirs having production of >1 MMbbl that are assigned to a North-Central Texas play but occur in Permian Basin counties will be identified in a separate table in the final database compilation. These reservoirs are in the Pennsylvanian/Lower Permian Reef/Bank play. Of the approximately 75 reservoirs having produced >1 MMbbl in this play, 14 of them occur in the Permian Basin.

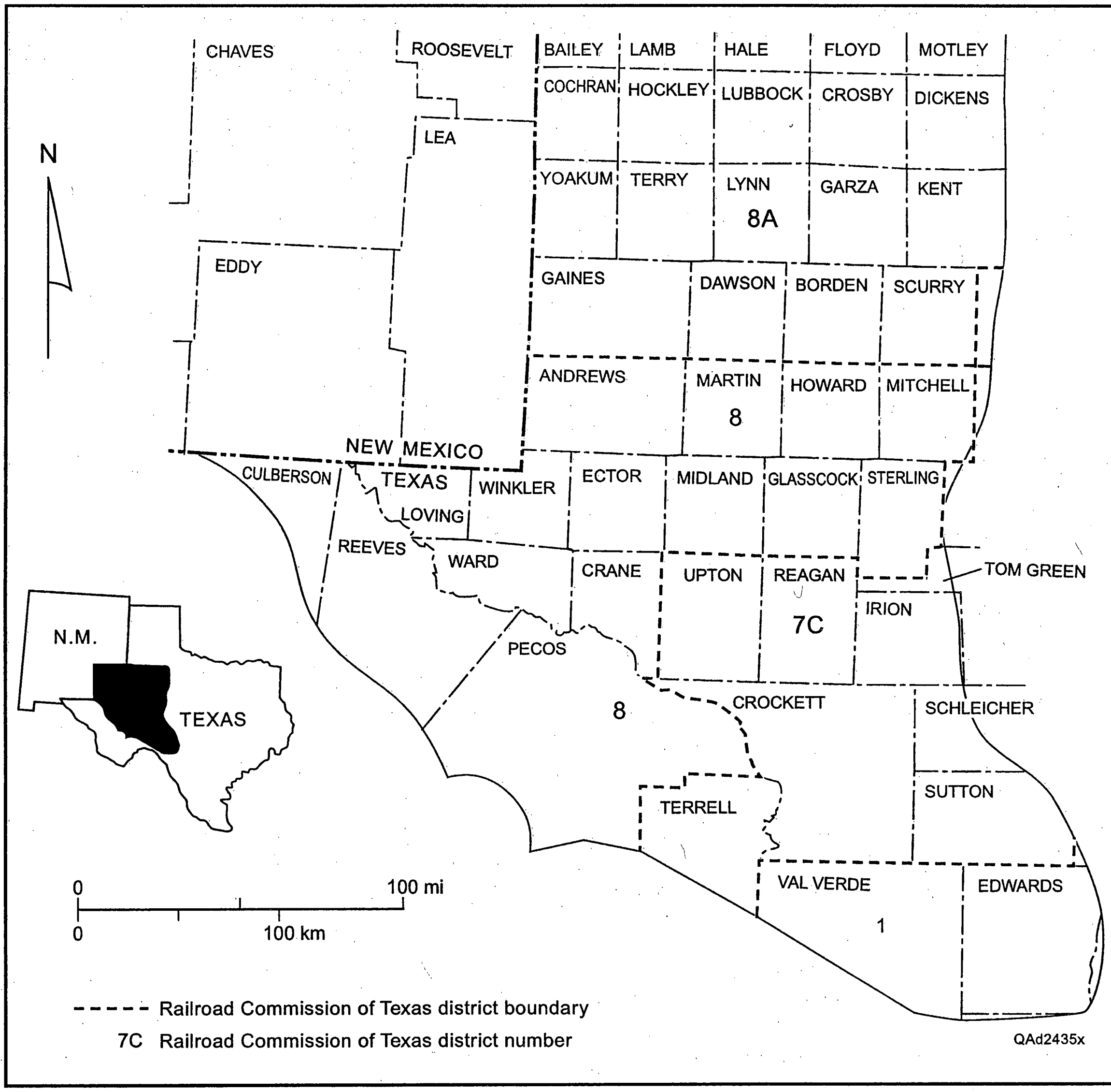

FIGURE 3. Counties in Texas and New Mexico in the Permian Basin geologic province.

Identifying reservoirs having >1 MMbbl cumulative production

The *Atlas of Major Texas Oil Reservoirs* (Galloway and others, 1983) contains information about reservoirs having cumulative production of >10 MMbbl of oil. In the current project, the coverage has been expanded greatly to include smaller but significant-sized reservoirs having cumulative production of >1 MMbbl of oil through December 31, 2000.

Texas

The production records of the Railroad Commission of Texas (RRC) were used to identify all reservoirs in the Texas part of the Permian Basin that had produced >1 MMbbl of oil through 2000. Cumulative production data were obtained from the 2000 Oil and Gas Annual Report (Railroad Commission of Texas, 2001), along with the official field and reservoir name, RRC District, year the reservoir was discovered, and depth to the top of the reservoir. Condensate production was not included. The RRC unique reservoir number was obtained for each reservoir using the online database at http://driller.rrc.state.tx.us/Apps/WebObjects/acti.

Approximately 1,000 reservoirs have produced >1 MMbbl of oil in the Texas part of the Permian Basin. Those reservoirs are listed, by Railroad Commission District, in Appendix A.

Many reservoirs were initially designated as separate reservoirs by the RRC but subsequently transferred into another reservoir. In this report, cumulative production is listed only under the final reservoir name (as of 2000) into which one or more other reservoirs had been transferred. Reservoirs that had other reservoirs transferred into them are highlighted by gray shading in Appendix A. The cumulative production value for these reservoirs represents total production, including production both before and after the reservoirs were combined.

This method of reporting differs from that of the RRC in its annual reports. RRC reports list production from a reservoir from the time of discovery until its transfer into another reservoir. Once the reservoir has been combined with another, the production from the original reservoir continues to be listed year after year, never increasing because all new production is assigned to the new reservoir. We chose not to follow this method because some production that should be reported as part of the total production from a reservoir would be lost if the reservoir did not produce >1 MMbbl before it was transferred into another reservoir.

An example should help clarify this compilation method. Conger (Penn) reservoir in District 8, Glasscock County, is listed in the 2000 Oil & Gas Annual Report (Railroad Commission of Texas, 2001) as having produced 19,249,341 bbl of oil through 2000. In Appendix A, however, Conger (Penn) is listed as having produced 20,406,213 bbl. This discrepancy occurs because three other reservoirs were transferred into Conger (Penn)—Big Salute (Canyon), Conger (Canyon), and Conger (Cisco). Big Salute produced 872,144 bbl of oil from the time it was discovered in 1974 until it was transferred into Conger (Penn) in 1978. Conger (Canyon) and Conger (Cisco) reservoirs produced 49,631 and 235,127 bbl, respectively, before they were transferred into the Conger (Penn) reservoir. Because the goal of this report is to show total production from major oil reservoirs, we have added the production from these three reservoirs to the total shown for Conger (Penn). Otherwise, this production would not have been included because none of these three reservoirs produced >1 MMbbl before being transferred into Conger (Penn).

New Mexico

Oil and gas reservoirs (pools) in New Mexico are named according to rules promulgated by the Oil Conservation Division (OCD) of the New Mexico Energy, Minerals and Natural Resources Department. Each reservoir, or pool, has two components to its name. The first part of the reservoir name is the field name; the field name is geographic and denotes an aerially continuous oil or gas accumulation. The second part is stratigraphic and is derived from the principal stratigraphic unit (formation) from which the pool is productive (fig. 4).

Ideally, in the definition of a reservoir, all productive zones in the defined reservoir should be restricted to a single stratigraphic unit and should be in pressure communication with one another. In practice, however, a well may be completed in several isolated zones in a formation, and production from these zones is commingled. Production from each zone is not tracked separately. Therefore, production units recognized as reservoirs often approximate the ideal definition of a reservoir but sometimes produce from multiple hydraulically isolated zones within a single formation (fig. 5).

For most New Mexico reservoirs, most or all production has been obtained from a single stratigraphic unit or formation. In these cases, the assignment of a reservoir to a play is straightforward because most plays have a stratigraphic component to their definition. In some reservoirs, however, the OCD has permitted significant commingling of oil and gas production across formational boundaries. In these cases, the stratigraphic component of the pool name contains two or more formational names (for example, the Justis Blinebry Tubb Drinkard pool). In cases where both formational names have been assigned to the same play (for example, production from the Blinebry,

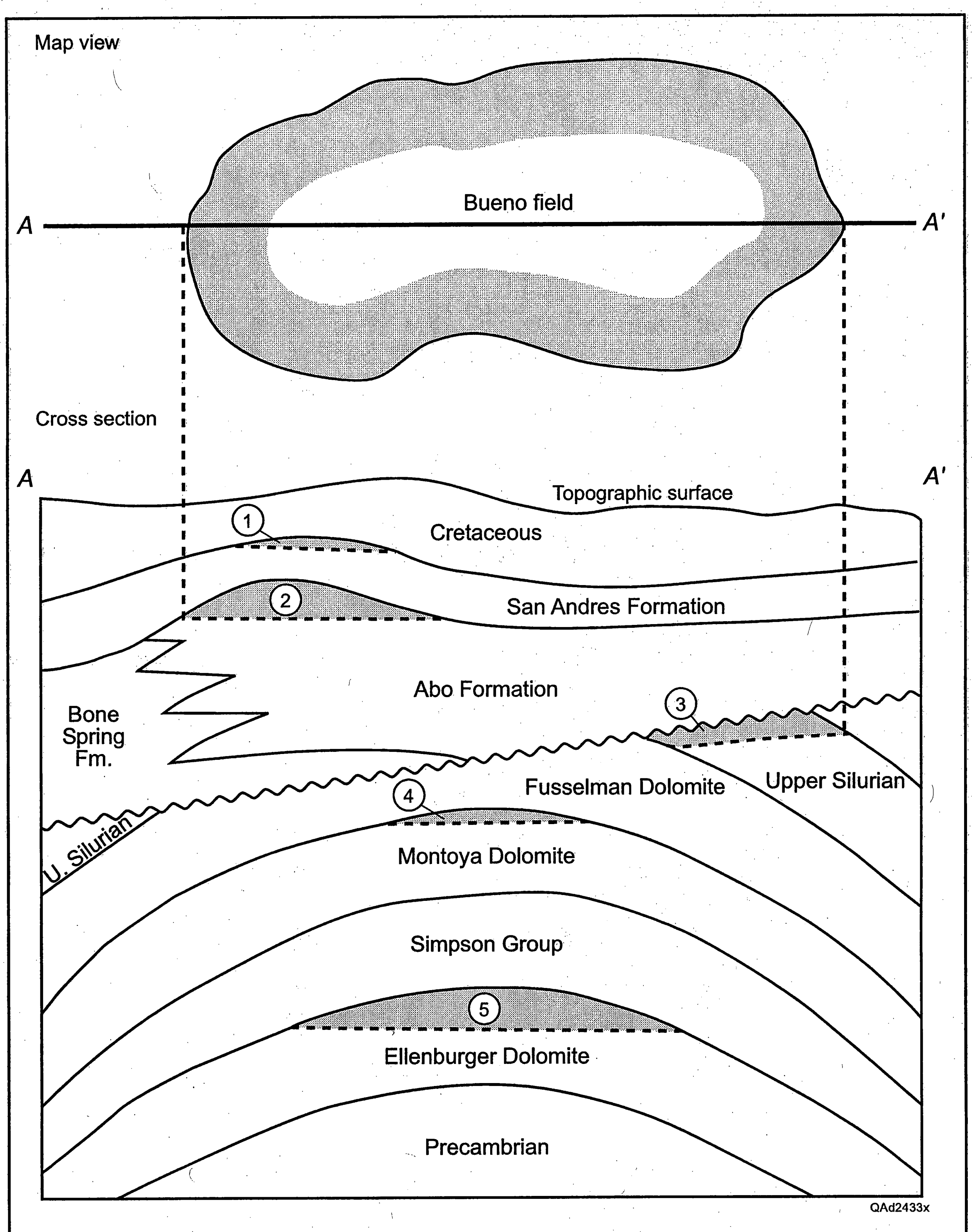

FIGURE 4. Relationship between a field and its constituent reservoirs (or pools). The field name is Bueno. The reservoirs are (1) Bueno San Andres, (2) Bueno Abo, (3) Bueno Upper Silurian, (4) Bueno Montoya, and (5) Bueno Ellenburger. From New Mexico Bureau of Mines and Mineral Resources (1993).

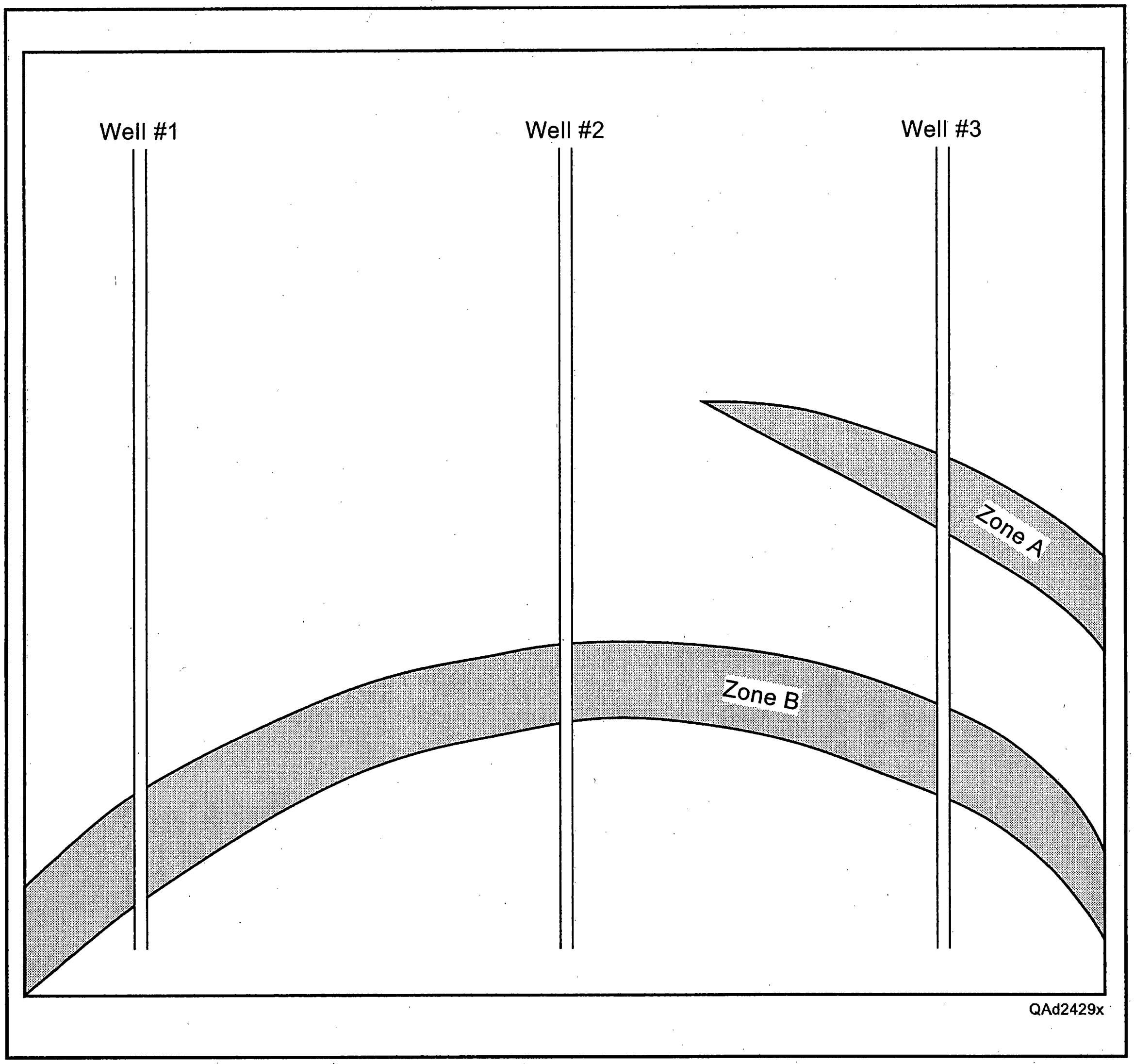

FIGURE 5. All production from a named reservoir may not be in pressure communication. In this case, wells 1, 2, and 3 produce from zone B and are in pressure communication with one another. However, well 3 has commingled production from zones A and B that are hydraulically isolated from one another. In this case, the reservoir is considered to consist of both zones A and B because production from each of the two zones is not recorded separately. In most New Mexico reservoirs, this is not the case, but this example is applicable to some New Mexico reservoirs.

Tubb, and Drinkard members of the Yeso Formation is assigned in entirety to the Leonardian Restricted Platform Carbonate play), assignment of the reservoir to a play is straightforward.

However, if the formations were assigned to different plays (for example, the Loco Hills Queen Grayburg San Andres pool), then production from the reservoir is divided between two plays. For these pools, records of numerous individual wells were examined to ascertain whether one constituent formation provided the overwhelming percentage of the production or whether all the listed formations contributed major percentages of production. In most cases, it was found that one formation contributed the dominant amount of production, and the pool was assigned to the play associated with that formation. This assignment is apparent if only a few wells were completed in a second formation or if wells completed solely in one of the formations recovered only minor volumes of oil (stripper-type wells).

In a few cases however, it became apparent that multiple formations are major contributors to production from a single pool. In these cases, the pools will be cross-listed in multiple plays because it is not possible to assign fractional parts of commingled production to a single reservoir stratum. These cross-listed pools are generally very large, and it is certain that each of the constituent formations has contributed >1 MMbbl cumulative production.

Finally, a complication occurs in some lower Paleozoic reservoirs (mainly Devonian and Silurian) where the formational name is inaccurate with respect to modern stratigraphic interpretations. For example, fields that produce from what is now recognized as the Silurian Wristen Group have been historically called Devonian, and this Devonian descriptor is used in the pool name. Because these name designations are official, they are left unchanged in the database, but a column has been added that correctly identifies the producing formation.

Procedure used for obtaining cumulative production for New Mexico reservoirs

The following approach was used to determine cumulative production data for each reservoir.

1. Cumulative production data for each reservoir were obtained from the 1993 Annual Report of the New Mexico Oil and Gas Engineering Committee. The cumulative production data tabulated by reservoir are available only in this hardcopy report and are not available digitally. The production data were entered into an Excel spreadsheet along with the reservoir name and the productive stratigraphic unit. Cumulative production data tabulated by reservoir in pre-1994 reports of the New Mexico Oil and Gas Engineering Committee are valid. The 1993 report lists cumulative data as of December 31, 1993.

2. Annual oil production data for each reservoir for years subsequent to 1993 were obtained from the 1994, 1995, 1996, 1997, 1998, 1999, and 2000 Annual Reports of the New Mexico Oil and Gas Engineering Committee. These data were entered into the Excel spreadsheet that contains the 1993 cumulative production data. The annual production data in the post-1993 reports, as tabulated by reservoir, are valid. However, cumulative production data by reservoir, as tabulated by reservoir, in the post-1993 reports are not valid because they do not include historical production from several types of wells, including

a. older wells that had formerly produced from the reservoir but were subsequently plugged and abandoned,

b. older wells that had formerly produced from the reservoir but were subsequently recompleted to another zone,

c. some production from wells whose operator had changed during the lifetime of the well; in some cases, production prior to an operator-name change is not included in the cumulative production data for a well or for wells in a reservoir.

The problems with post-1993 cumulative production data result from a change in the New Mexico production data system in 1994, which omitted data described in a, b, and c above.

3. Cumulative production for each reservoir was calculated by taking the annual production from 1994 through 2000 and adding it to the cumulative production data obtained from the 1993 annual report. Reservoirs in the New Mexico part of the Permian Basin having cumulative production of >1 MMbbl are listed by county in Appendix B, along with producing formation, discovery date, and depth.

Total Permian Basin Production

Cumulative production through 2000 from the major oil reservoirs in the Permian Basin, those reservoirs having cumulative production of >1 MMbbl, was 28.9 Bbbl. Of that, 24.5 Bbbl was produced in Texas and 4.5 Bbbl in New Mexico.

Defining plays

Plays can generally be considered as groups of reservoirs that have similar geologic parameters, such as a common stratigraphic unit, reservoir lithology, reservoir depositional environment, structural and tectonic setting, or trapping mechanism. Plays are defined on the basis of structural and tectonic setting, reservoir stratigraphy, reservoir lithology, depositional environment of the reservoir, and fluid type. Gas plays are not included in this project.

Texas

Thirty-two plays covering both the Texas and New Mexico parts of the Permian Basin were defined during the first year of the project (table 1). There may be further refinement of these plays in the coming year. The plays in Texas have been extensively modified from those defined in the *Atlas of Major Texas Oil Reservoirs* (Galloway and others, 1983) on the basis of the past 20 years of research on Permian Basin reservoirs. The oil atlas and more recent play assessments of the Permian Basin by Tyler and others (1991), Holtz and Kerans (1992), Holtz and others (1992), Holtz (1993), Holtz and others (1993), Ruppel and Holtz (1994), and Dutton and others (2000) provided the foundation on which the Texas play assessment was based.

Table 1. Preliminary list of Permian Basin oil plays.

Plays in Texas	Plays in New Mexico
Permian	
Guadalupian	
Artesia Platform Sandstone	Artesia Platform Sandstone
Queen Tidal-Flat Sandstone	
Delaware Basin Submarine-Fan Sandstone	Delaware Basin Submarine-Fan Sandstone
Grayburg High Energy Platform Carbonate—Ozona Arch	
Grayburg Platform Carbonate	
Grayburg Platform Mixed Clastic/Carbonate	Grayburg Platform Mixed Clastic/Carbonate
Grayburg Lowstand Carbonate	
	Upper San Andres and Grayburg Platform Mixed
San Andres Platform Carbonate	San Andres Platform Carbonate
San Andres Karst-Modified Platform Carbonate	
Eastern Shelf San Andres Platform Carbonate	
Northern Shelf San Andres Platform Carbonate	
Leonardian	
Spraberry/Dean Submarine-Fan Sandstone	
	Bone Spring Basinal Sandstone and Carbonate
Leonardian Restricted Platform Carbonate	Leonardian Restricted Platform Carbonate
Abo Platform Carbonate	Abo Platform Carbonate
Wolfcampian	
Wolfcamp Platform Carbonate	Wolfcamp Platform Carbonate
Wolfcamp/Leonard Basinal Carbonate	Wolfcamp/Leonard Basinal Carbonate
	Wolfcamp Granite Wash

Table 1. Continued.

	Plays in Texas	Plays in New Mexico
Pennsylvanian		
	Upper Pennsylvanian and Lower Permian Slope and Basinal Sandstone	
	Pennsylvanian and Lower Permian Horseshoe Atoll Carbonate	
	Pennsylvanian Platform Carbonate	
		Northwest Shelf Upper Pennsylvanian Carbonates
		Northwest Shelf Strawn Patch Reef
Mississippian		
	Mississippian Platform Carbonate	
Siluro-Devonian		
	Devonian Thirtyone Ramp Carbonate	Devonian Thirtyone Ramp Carbonate
	Devonian Thirtyone Deep-Water Chert	
	Wristen Buildups and Platform Carbonate	Wristen Buildups and Platform Carbonate
	Fusselman Shallow Platform Carbonate	Fusselman Shallow Platform Carbonate
Ordovician		
	Simpson Cratonic Sandstone	Simpson Cratonic Sandstone
	Ellenburger Karst-Modified Restricted Ramp Carbonate	Ellenburger Karst-Modified Restricted Ramp Carbonate
	Ellenburger Selectively Dolomitized Ramp Carbonate	

New Mexico

Play definition in New Mexico also relied heavily on previous play-definition work in New Mexico (New Mexico Bureau of Mines and Mineral Resources, 1993) and in Texas (Galloway and others, 1983; Kosters and others, 1989), as well as ongoing play-definition work for the Texas part of this project. Insofar as possible, plays used in New Mexico are extensions of plays defined in Texas. Several plays cross the border between Texas and New Mexico.

Structural- and tectonic-setting analysis considers whether the play is located in the deep Delaware Basin or on the platform area of the Central Basin Platform and Northwest Shelf. When plays productive from strata older than Pennsylvanian are looked at, structural and tectonic setting is not considered because the Permian Basin did not become segmented into its tectonic subdivisions until the Pennsylvanian (Hills, 1984).

Reservoir stratigraphy and lithology are also important factors used in the definition of plays. In southeast New Mexico, all plays are limited to well-defined stratal units or formations. Most stratal units are composed of multiple lithologic types, but significant reservoirs may be limited to only one lithology. Identification of reservoir lithology in a multilithologic stratal unit helps explain reservoir trends and productive characteristics of reservoirs.

Depositional environment, also used in play definition, is intimately tied to structural and tectonic setting, reservoir lithology, and reservoir stratigraphy. For example, carbonate debris flows are generally confined to a basinal setting immediately basinward of a shelf edge characterized by well-developed shelf-margin carbonate buildups.

Assigning reservoirs to plays

A total of about 1,000 reservoirs in Texas and 300 reservoirs in New Mexico had produced >1 MMbbl of oil through 2000. During this first year of the project, each of these reservoirs was tentatively assigned to a play. For several reservoirs, however, questions remain about the play assignments, and so many of these designations may change during the coming year as more information about the reservoirs is acquired.

Assignment of reservoirs to one of the 27 plays in Texas is based primarily on published information and information in hearing files of the Railroad Commission of Texas. Reservoir interval, depositional setting, tectonic and structural setting, postdepositional karstification, and trapping mechanism were attributes used to assign reservoirs to plays. Publications of the BEG, the NMBGMR, the West Texas Geological Society, the Roswell Geological Society, and the Permian Basin Section SEPM, as well as discussions with BEG and NMBGMR researchers, were used to make play assignments. The field summaries published by the Bureau of Economic Geology (1957) and the West Texas Geological Society (1982, 1987, 1990, 1994, 1996) were particularly helpful.

The task of assigning reservoirs to plays in New Mexico is not especially difficult, although it requires meticulous checking of several data attributes of each reservoir. The main data attributes include (1) productive stratal unit (formation), (2) tectonic and structural location within the Permian Basin, (3) reservoir lithology, and (4) depositional environment of the reservoir.

The locations of all New Mexico reservoirs have been plotted on reference base maps at the NMBGMR. The basin-scale maps indicate the field name and the OCD-assigned stratigraphic component of pool names. This information provides rough data on the productive stratal unit. The location on the base maps allows reference of the pool location to regional tectonic and structural elements.

Information on reservoir lithology was obtained primarily from the field summaries published by the Roswell Geological Society (Roswell Geological Society, 1956, 1960, 1967, 1977, 1988, 1995). The Roswell Geological Society volumes present short, 1- to 2-page summaries of reservoirs that give information on the reservoir name, lithology, trapping mechanism, depth, and discovery date, as well as several other parameters. Because not all reservoirs have been summarized in these volumes, when summaries were not available, other sources of data were used. Major sources of data are the well records, sample descriptions, and logs on file at the Subsurface Library of the NMBGMR. Descriptions of some reservoirs and plays have been published (LeMay, 1960, 1972; Malek-Aslani, 1985; Gawloski, 1987; Grant and Foster, 1989; New Mexico Bureau of Mines and Mineral Resources, 1993; Baldonado and Broadhead, 2002). Ongoing thesis work at New Mexico Tech and the NMBGMR proved indispensable in assigning Silurian and Devonian reservoirs to plays.

Data on depositional environments of reservoirs were obtained from published studies. Especially important were the works of LeMay (1960), Milner (1978), Wright (1979), Presley and McGillis (1982), Malek-Aslani (1985), Wiggins and Harris (1985), Cys (1986), Ward and others (1986), Gawloski (1987), Mazzullo and Reid (1987), Kerans (1988), Harms and Williamson (1988), Elliott and Warren (1989), Foster and Grant (1989), Saller and others (1989), Verseput (1989), Malisce and Mazzullo (1990), Mazzullo (1990), Borer and Harris, (1991a, b), Keller (1992), New Mexico Bureau of

Mines and Mineral Resources (1993), Montgomery and others (1999), and Baldonado and Broadhead (2002).

Eighteen plays have been recognized in southeast New Mexico (table 1). Most of the plays are continuous across the New Mexico–Texas border, but five are unique to New Mexico. In most cases, the play names established in Texas can also be used in New Mexico because of identical stratigraphy, tectonic setting, and depositional environments.

The San Andres and Grayburg Formations (Permian) in New Mexico and Texas have produced very large volumes of oil from numerous reservoirs, several of which have produced more than 100 MMbbl. Both the Grayburg Platform Mixed Clastic/Carbonate play and the San Andres Platform Carbonate play, defined in Texas, have been recognized in New Mexico. In New Mexico, however, a third play has been recognized, the Upper San Andres and Grayburg Platform Mixed play. The need for this third play is driven by two factors. First, in New Mexico, production in several large reservoirs has been commingled extensively from both the San Andres and Grayburg Formations and there is difficulty separating San Andres production from Grayburg production. Second, significant volumes of production in this play have been contributed from high-permeability sandstone reservoirs in the lower part of the Grayburg Formation, so the play must encompass clastic as well as carbonate reservoirs. Examination of well records indicates that, in some fields, it is possible that a majority of the production may have been obtained from the Grayburg sandstones, with perhaps secondary—but still significant—production coming from the carbonates.

Locating and mapping reservoirs in GIS

Mapping of the 1,300 oil reservoirs in the Permian Basin having cumulative production of >1 MMbbl was begun this year. Different procedures are being used for reservoirs in Texas and New Mexico because of the different data available in each state.

Texas

Mapping of the approximately 1,000 reservoirs in Texas was well under way at the end of the first year of the project, with a total of 594 reservoirs having been mapped. The reservoirs are being mapped in groups, according to their preliminary play designations. Even though the final play designation for each reservoir will not be completed until next year, the reservoirs can be initially mapped. If in the future it is determined that a reservoir should be in a different play, it can easily be reassigned and linked to the new play.

Numerous data sources were utilized for mapping reservoirs in the Permian Basin of Texas. The initial dataset accessed is from Landmark Graphic's Datastar™product. The Datastar™product, compiled from data maintained by Whitestar Corporation, provides oil and gas well spots, land grids, and cultural information for the entire U.S. If an area is outlined, all these data are extracted from Datastar™in a GIS shapefile format. These shapefiles are then imported into the ArcView™GIS software package. The imported shapefiles store information including API numbers, latitude, longitude, well name, and field/reservoir name, as well as numerous other data columns. Of particular interest is the field/reservoir name of each well; this name is used to classify the location of wells in a reservoir. Through the field/reservoir name, the shapefiles are refined by the deletion of all

reservoirs that do not compose the play of interest. In addition, the Texas abstract and county-line shapefiles are available for display, along with the well locations.

After the initial mapping of reservoirs, other data sources are used to verify the locations, which is accomplished by comparing the mapped reservoirs with well location data obtained from DrillingInfo.com, Inc. Well location and production data are provided, and a search based on the field/reservoir name yields a spotting of wells. Wells without any production are deleted, and the display of well locations is compared with the initial mapping of reservoirs. If discrepancies exist, corrections are made to the shapefile. Other nondigital maps that are used for data verification include the BEG oil and gas atlases (Galloway and others, 1983; Kosters and others, 1989), the Geomap Company Permian Basin Executive Reference Map (Geomap Company, 1998), the Structurmaps, Ltd., Permian Basin structure map (Structurmaps Ltd., 1970), and the Midland Map Company Permian Basin regional base map (Midland Map Company, 1997). Well production is compared using Lasser Inc.'s Texas production database (Lasser Data Pages, 2003), as well as RRC production reports (Railroad Commission of Texas, 2001).

Actual mapping of reservoir outlines is done entirely in ArcView GIS using Texas abstract and county-line shapefiles as the base map and the previously extracted well-location shapefile as the basis for the geographic location of each reservoir outlined. Each play mapped has a well-location shapefile that has an associated point-attribute table (PAT) stored as a dBASE file containing detailed information about each point feature. The records in the PAT can be sorted and then selected on the basis of the field/reservoir name, thus isolating the cluster of wells that make up a particular reservoir. In order to keep the distance from the well locations to the reservoir boundary consistent for each reservoir mapped, selected wells are buffered by 0.5 mi, creating a temporary shapefile of polygons that is used as a guide in creating the actual reservoir outline.

For each play, a new shapefile of reservoir outlines is created using the temporary shapefile of buffered wells as a guide. With each polygon, or reservoir, that is added to the new shapefile, a new record is added to the associated attribute table. When a shapefile is edited or added to in ArcView, the associated attribute table is also editable. This feature enables the reservoir outlines added to be given code names, which can later be linked to the complete reservoir data table. After all the reservoirs in a given play are drawn and coded, a map is printed for verification.

Once the printed map of reservoirs has been checked, necessary edits are made to the shapefile within ArcView. The final reservoir shapefile for each play contains the geographic location of each reservoir (figs. 6, 7) and all associated information within the linked dBASE data table, such as the field/reservoir name, RRC district and county, depth to top, and cumulative production (tables 2, 3). The final GIS product of this process will be an ArcView project file containing the base maps, the newly created series of play-specific reservoir shapefiles, and the play-boundary shapefile.

The reservoir outlines generated by this process are intended to show the approximate location, size, and shape of each reservoir, but they are not precise boundaries. The reservoir shapes, therefore, should not be used to calculate subsurface reservoir area for accurate volumetric determinations.

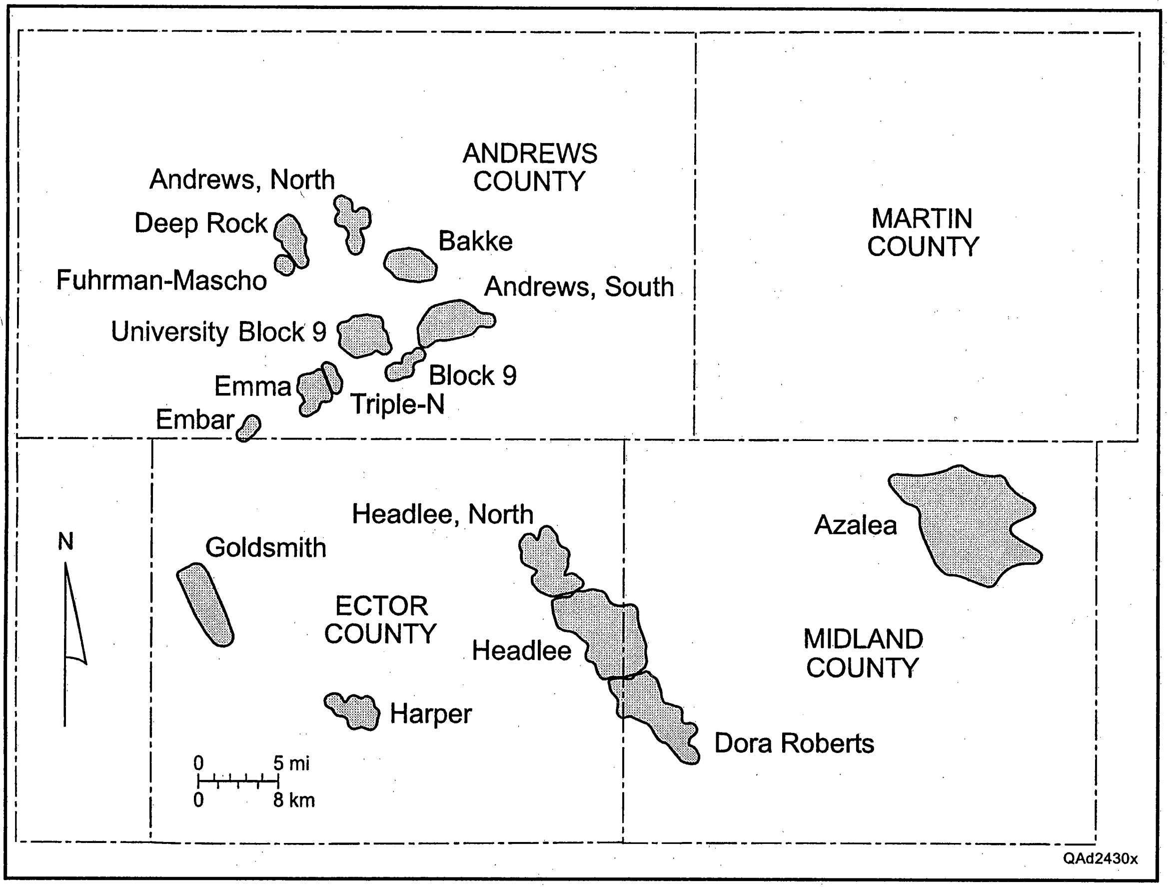

FIGURE 6. Example of a draft play map in Texas showing reservoir outlines for the Devonian Thirtyone Ramp Carbonate play, showing reservoirs having >1 MMbbl cumulative production.

New Mexico

Those fields with >1 MMbbl production have been placed into geologic plays that, wherever possible, coincide with play names established by the BEG (table 1). In many cases these play groupings do not match the existing New Mexico pool groupings. An entirely new database is being created that (1) eliminates all New Mexico pools with <1 MMbbl production, (2) reorders the New Mexico pool database to reflect groupings based on the newly defined play types, (3) adds production data by pool. This new database collection is being entered into ArcView GIS using pool shapefiles outlining field boundaries copied from the preexisting New Mexico pools project. When

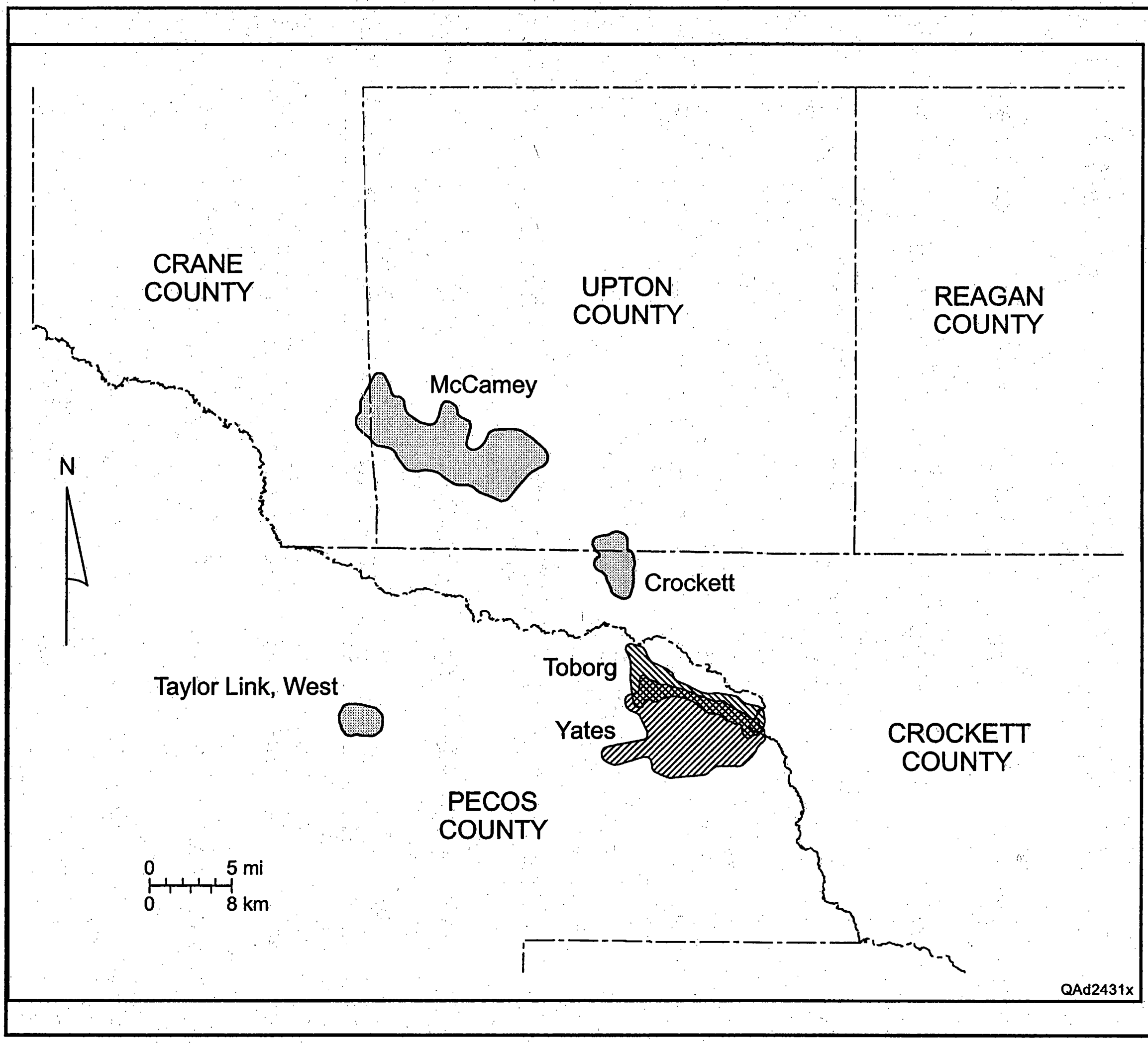

FIGURE 7. Example of a draft play map in Texas showing reservoir outlines for the San Andres Karst-Modified Platform Carbonate play and reservoirs that have >1 MMbbl cumulative production.

completed, each PUMP-defined play will be able to be displayed separately or in combination with any or all other plays. A page-size example of a play map, the Abo Platform Carbonate play in New Mexico, is shown in figure 8. The GIS data tables for New Mexico contain the following headers: Field, Pool, Reservoir, County, Discovery Year, Depth, Oil- vs. Gas-Dominated Production, Cumulative Production, Primary Play Name, Secondary Play Name, and Tertiary Play Name.

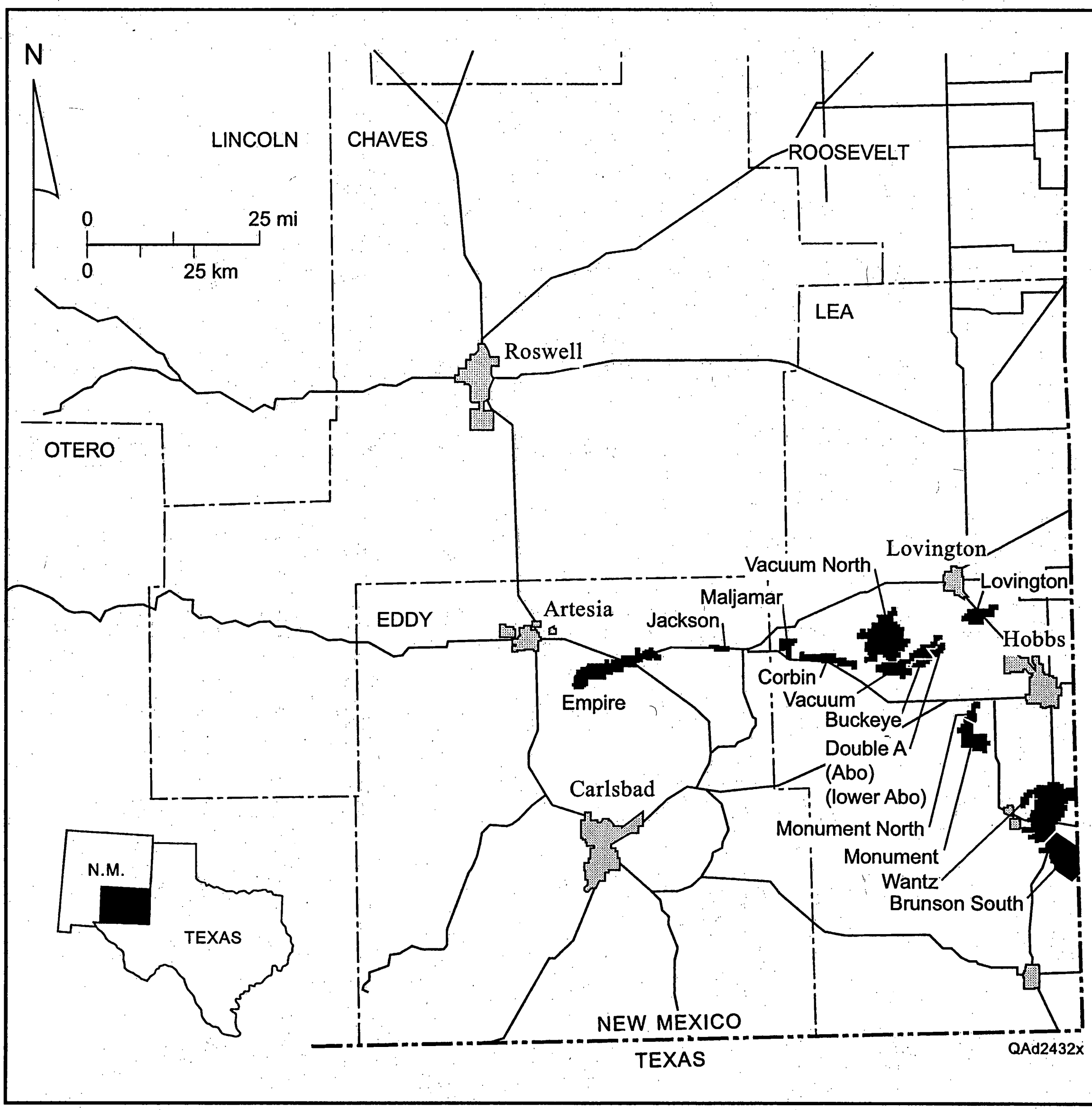

FIGURE 8. Example of a draft play map showing the Abo Platform Carbonate play in New Mexico and reservoirs that have >1 MMbbl cumulative production.

Table 2. Example of play data table for the Devonian Thirtyone Ramp Carbonate play. Shading indicates a combined reservor.

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
2727250	8	ANDREWS, N.	DEVONIAN	ANDREWS	1960	10424	7,844,331
2730284	8	ANDREWS, SOUTH	DEVONIAN	ANDREWS	1953	11075	10,316,428
4605222	8	AZALEA	DEVONIAN	MIDLAND	1957	11520	1,714,524
5166333	8	BAKKE	DEVONIAN	ANDREWS	1956	10500	17,106,630
9202166	8	BLOCK 9	DEVONIAN	ANDREWS	1960	12540	1,540,950
23907142	8	DEEP ROCK	DEVONIAN	ANDREWS	1963	10063	1,713,689
25395166	8	DORA ROBERTS	DEVONIAN	MIDLAND	1955	12010	2,528,808
28843111	8	EMBAR	DEVONIAN	ANDREWS	1954	9346	1,335,402
28899166	8	EMMA	DEVONIAN	ANDREWS	1954	10192	5,753,019
33176284	8	FUHRMAN-MASCHO	DEVONIAN	ANDREWS	1956	10000	1,835,504
35652310	8	GOLDSMITH	FIGURE 5 DEVONIAN	ECTOR	1956	7760	1,358,571
39176332	8	HARPER	DEVONIAN	ECTOR	1962	10005	10,515,508
39969400	8	HEADLEE	DEVONIAN	ECTOR	1953	11756	14,167,925
39971500	8	HEADLEE, N.	DEVONIAN	ECTOR	1956	12210	6,195,590
91350100	8	TRIPLE-N	DEVONIAN	ANDREWS	1957	10600	1,072,723
92534250	8	UNIVERSITY BLOCK 9	DEVONIAN	ANDREWS	1954	10450	23,606,166

RRC_RESN = Railroad Commission of Texas reservoir number
RRC = Railroad Commission of Texas district number
FLDNAME = Field name
RESNAME = Reservoir name
DISCYR = Discovery year
DEPTHTOP = Depth in feet to top of reservoir
CUMPROD = Cumulative production in barrels through December 31, 2000

Table 3. Example of play data table for the San Andres Karst-Modified Platform Carbonate play.

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
21766001	7C	CROCKETT		CROCKETT	1938	1571	4,762,786
58840001	7C	MCCAMEY		UPTON	1925	2100	135,137,987
88567700	8	TAYLOR LINK W.	SAN ANDRES	PECOS	1984	1800	1,640,304
90286001	8	TOBORG		PECOS	1929	500	43,045,830
99295001	8	YATES		PECOS	1926	1500	1,381,373,107

RRC_RESN = Railroad Commission of Texas reservoir number
RRC = Railroad Commission of Texas district number
FLDNAME = Field name
RESNAME = Reservoir name
DISCYR = Discovery year
DEPTHTOP = Depth in feet to top of reservoir
CUMPROD = Cumulative production in barrels through December 31, 2000

Reservoir Characterization of Key Reservoirs

Reservoir-characterization studies of key reservoirs from three of the largest or most active plays in the Permian Basin are being conducted as part of this project. The reservoirs being studied are Kelly-Snyder (SACROC unit) in the Pennsylvanian and Lower Permian Horseshoe Atoll Carbonate play, Fullerton in the Leonardian Restricted Platform Carbonate play, and Barnhart (Ellenburger) in the Ellenburger Selectively Dolomitized Ramp Carbonate play (fig. 9). The geologic heterogeneity in these reservoirs is being investigated so that production constraints that would apply to other reservoirs in that play can be better understood. For each of these detailed reservoir studies, technologies for further, economically viable exploitation are being investigated. The information on improved practices in reservoir development will be incorporated into the play portfolio.

Barnhart

Barnhart field in Reagan County, Texas (fig. 9), produces from the Ellenburger Group and is part of the Ellenburger Selectively Dolomitized Ramp Carbonate play. This is a major, deep-basin carbonate reservoir play in the Permian Basin that contains a remaining mobile oil fraction of as much as 900 MMbbl of oil (Tyler and Banta, 1989). The Ellenburger reservoir in Barnhart field is composed of shallow-water, Lower Ordovician carbonates containing both dolostone and limestone (Gomez and others, 2001) at a depth of about 9,000 ft.

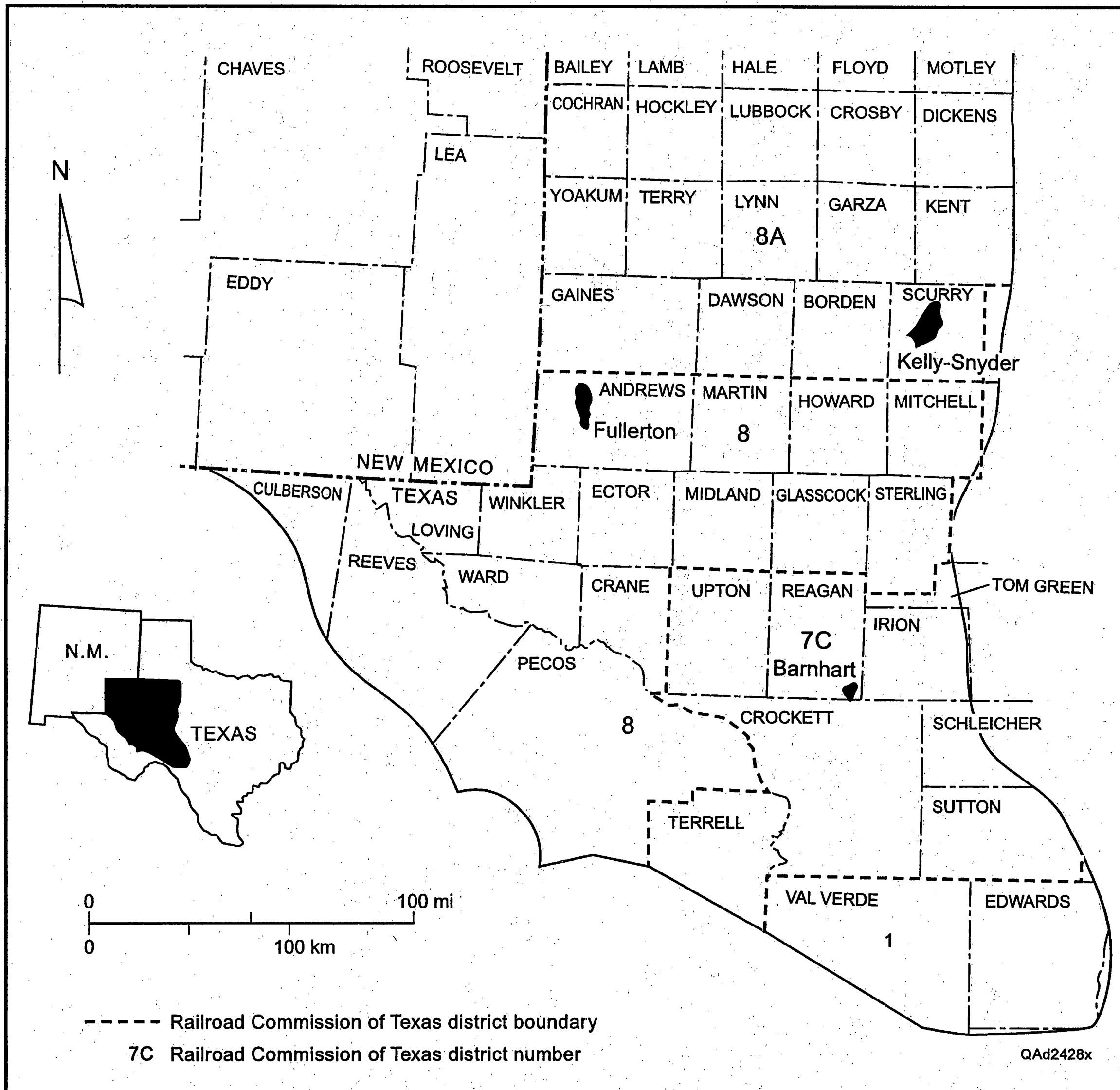

FIGURE 9. Location of reservoirs being studied in detail in this project: Kelly-Snyder (SACROC unit) in the Pennsylvanian and Lower Permian Horseshoe Atoll Carbonate play, Fullerton in the Leonardian Restricted Platform Carbonate play, and Barnhart (Ellenburger) in the Ellenburger Selectively Dolomitized Ramp Carbonate play.

Discovered in 1941, Barnhart field has produced about 16 MMbbl of an estimated 115 MMbbl OOIP from the Ellenburger (Galloway and others, 1983; Tyler and others, 1991). The poor recovery efficiency at Barnhart is due to the loss of reservoir energy caused by pressure decline in the solution-gas-drive reservoir. Reservoir pressure has declined from its original 3,920 psi to the current 1,600 psi. Current production from the field is less than 21,000 bbl per year from six active wells. Secondary recovery has never been implemented in the field owing to the high cost of drilling required.

Goldrus Producing Company operates the Barnhart (Ellenburger) Unit, which comprises >5,000 acres (about one-half of the field). In conjunction with the BEG and the field royalty owner, the University of Texas System, Goldrus installed a two-well pilot to test the effectiveness of high-pressure air injection (HPAI) technology in the Barnhart Ellenburger reservoir. HPAI, a tertiary oil-recovery technology, works by creating downhole combustion of oxygen and oil to produce flue gas (nitrogen and carbon dioxide) that serves, at the same time, to repressurize and flood the reservoir. Goldrus is testing HPAI at Barnhart because the technology requires fewer injectors than more conventional secondary and tertiary recovery operations.

Results from the pilot confirm that combustion is taking place in the reservoir (documented by the generation of elevated levels of CO_2 and N_2 gases in the producing well) and show increased oil production, indicating that reservoir drive energy is being restored. This pilot consists of a single vertical injection well and a horizontal producing well. Air injection was initiated in the vertical injection well and has verified the ability to maintain stabilized air-injection rates of 1,500 thousand cubic feet per day (Mcfd). Injection rates and volumes are well within range for commercial development. A positive production response has been monitored in the horizontal producing well, and there has been no evidence to indicate adverse directional permeability that would inhibit the sweep efficiency of this process. Oil production from the second well is already three to five times the rates observed before HPAI. Natural gas production is also high: as much as 30 to 50 times higher than from other field wells.

Characterization of the reservoir architecture at Barnhart field is especially critical because of the complexity of the fractured and karsted Ellenburger Group carbonates that compose the reservoir. Key issues that are being studied at Barnhart field are (1) the distribution of karst features and their impact on flow and (2) the distribution, abundance, and orientation of fractures and their impact on flow. Work to date has established that fractures are abundant in the Ellenburger reservoir at Barnhart field on the basis of study of sidewall cores, conventional cores, and image logs (Gomez and others, 2001). A preliminary analysis of fracture types and orientations using sidewall cores and a conventional core has been completed using scanning electron-microscope-based cathodoluminescence (SEM-CL) for observing and imaging microfractures in carbonates. The next step is to integrate the fracture data with data from karst modeling studies to develop a refined model of the orientation and distribution of fractures in the reservoir. These models will be used to identify optimal patterns of injector-producer spacing and orientation. Efficient deployment and spacing of injectors and producers is key to the success of the HPAI project.

If HPAI technology is successful in Barnhart field, it can be applied to other reservoirs in the Ellenburger Selectively Dolomitized Ramp Carbonate play, as well as reservoirs in the Ellenburger Karst-Modified Restricted Ramp

Carbonate play. The Ellenburger plays contain a resource of about 900 MMbbl of remaining mobile oil that could be targeted for application of HPAI in the Permian Basin.

SACROC

Detailed reservoir studies are being conducted of the SACROC unit in the Pennsylvanian and Lower Permian Horseshoe Atoll Carbonate play. The SACROC (Scurry Area Canyon Reef Operators Committee) unit, which incorporates nearly all of Kelly-Snyder field, is the largest producing unit of the Horseshoe Atoll play. Since discovery in the 1940's, primary, secondary, and tertiary recovery activities have been extensive, with more than 1,500 wells in this, the first CO_2 flood in West Texas. In spite of this history, only the basics of the unit's stratigraphic and petrophysical architecture were understood. This study is based on data from well log and core-based examination of the northern third of the unit, including 550 wells, 3,500 ft of core, and 26 mi^2 of 3-D seismic data.

The 700-ft-thick reservoir column consists of Canyon and Cisco carbonates that change from layered cyclic, open-shelf, subtidal cycles having minimal diagenetic overprint (lower and mid-Canyon) to high-energy, shoal-related cycles having frequent exposure surfaces (upper Canyon–lower Cisco) and increased evidence of cycle and sequence-scale erosion (Kerans, 2001). Early Cisco deposition was characterized by dramatic changes in depositional style, including growth of pinnacle reefs and the formation of complex, fractured, muddy, crinoid-dominated facies that resemble Waulsortian deeper-water buildups. Seismic data were used extensively in constructing the stratigraphic framework and allowed significant advances in understanding of the stratigraphic architecture that were not possible with logs alone.

Seismic data were also fully integrated into 3-D geologic model through the following processes.

- Seismic data were first inverted to impedance and then porosity using a range of approaches, including standard Hampson Russell software and the neural-network technique.
- Two geologic models having the same layering were built in time and depth spaces. The seismic and inverted data cubes were first loaded in a 3-D time model and then copied into the 3-D depth model.
- 3-D porosity distributions were modeled using the seismically inverted porosity data constrained by 450 wireline logs.

The end result of this modeling effort, utilizing modern geologic, geophysical, and modeling practices, is a 3-D volume that is drastically different from that previously generated. Huge volumes of the platform previously modeled as a layer cake can be shown to consist of erosionally generated slope wedges associated with major icehouse eustatic sea-level falls. Complex promontories and reentrants similar to the present-day Bahama platform mark the edges of the field, and large windward-leeward asymmetries control reservoir-quality distribution. This modern model of SACROC should greatly aid ongoing efforts for enhanced recovery using WAG (water alternating gas) processes and related practices. An estimated 700 MMbbl of unrecovered mobile oil remains in the Pennsylvanian and Lower Permian Horseshoe Atoll Carbonate play (Tyler and Banta, 1989).

Fullerton

The third reservoir-characterization study is being done on the Clear Fork reservoir of Fullerton field, Andrews County (fig. 9), in the Leonardian Restricted Platform Carbonate play. This reservoir was discovered in 1941 and had produced nearly 306 MMbbl of oil through 2000. Study of the Fullerton Clear Fork reservoir has been subdivided into three phases. The first two phases, Phase 1 and Phase 2, are focusing, in turn, on two small areas of the reservoir; Phase 3 will involve study of the remaining parts of the reservoir and an integration of all three areas.

The goal of the Fullerton study is to develop techniques for improving the resolution and predictability of key reservoir properties leading to the construction of more accurate reservoir models for simulation and exploitation. The integration of cycle-stratigraphic, rock-property, and 3-D seismic data provides a basis for predicting the distribution of reservoir rock and fluid properties that is more robust than is currently obtainable from more conventional methodologies. The goal is being met by constructing an integrated outcrop and subsurface core-based, cycle-stratigraphic framework for the lower Clear Fork and Abo reservoir intervals at Fullerton field. More than 5,000 m of core from the field is being integrated with outcrop analogs in the Sierra Diablo Mountains of west Texas to develop a cycle-stratigraphic framework for petrophysically and seismically based definition of reservoir rock properties.

During the past year, the stratigraphic architecture has been established through correlation of wireline logs guided by core and outcrop studies of facies and cyclicity. A porosity model has been developed that creates a basis for calculation of porosity for wells in the study area. Rock fabrics have been defined by sampling, analysis, and description of cores and used to create transforms for calculating permeability and oil saturation from porosity data. A preliminary 3-D model of the Phase 1 area was constructed that incorporates stratigraphic architecture, rock fabric data, and petrophysical data. Next, a fine-grid 3-D geologic model was built and tested using 33 horizons and 85 wireline logs and containing porosity, permeability, and initial water saturation data. Permeability and water saturation were calculated using rock-fabric-based relationships. This 5.2-million-cell model comprises 149 columns, 110 rows, and 320 layers. Porosity, permeability, and water saturation were modeled deterministically with a 2,000-ft search radius. In general, the lowermost sequence of the Lower Clear Fork has the best porosity and permeability. The Wichita has good porosity but relatively lower permeability and porosity. The estimated OOIP for the Phase 1 area calculated from this model is 185 MMbbl. Because only 40 MMbbl has been produced to date from this area, 145 MMbbl, or about 80 percent of the OOIP, probably remains.

When one considers that the Phase 1 model area is one of the most completely developed parts of the field, these data suggest that a very large target resource remains in the field as a whole. Reservoir characterization of the entire reservoir, including imaging of rock fabrics and reservoir architecture and fluid flow modeling and simulation, will provide key insights into the best practices for improved recovery of this huge resource. Successful application of these new approaches in other Clear Fork reservoirs throughout the Permian Basin will target more than 2.5 Bbbl of remaining oil. These techniques may also apply to platform-carbonate reservoirs in other plays.

Conclusions

Good progress has been made on the Permian Basin PUMP project during the past year. All reservoirs in the Permian Basin having cumulative production of >1 MMbbl of oil were identified, and cumulative production through December 31, 2000, was determined. A total of about 1,000 reservoirs in Texas and 300 reservoirs in New Mexico had produced >1 MMbbl of oil through 2000. A reservoir database was established that lists the RRC reservoir number and district (Texas only), official field and reservoir name, year reservoir was discovered, depth to top of the reservoir, and cumulative production through 2000.

Thirty-two plays covering both the Texas and New Mexico parts of the Permian Basin were defined. There may be further refinement of these plays next year. Each of the 1,300 reservoirs having >1 MMbbl cumulative oil production has been tentatively assigned to a play. Because questions remain about the play assignments of several reservoirs, some of these designations may change during the coming year as more information about the fields is acquired.

Mapping of the 1,300 major oil reservoirs in the Permian Basin began this year. The mapping of reservoir outlines is being done by play in ArcView™GIS. The final reservoir shapefile for each play contains the geographic location of each reservoir and all associated reservoir information within the linked dBASE data table. The final GIS product of this process will be an ArcView project file containing the base map, the newly created series of play-specific reservoir shapefiles, and the play-boundary shapefile.

Reservoir-characterization studies of key reservoirs from three of the largest or most active plays in the Permian Basin are being conducted.

Detailed studies of the following reservoirs are in progress: Kelly-Snyder (SACROC unit) in the Pennsylvanian and Lower Permian Horseshoe Atoll Carbonate play, Fullerton in the Leonardian Restricted Platform Carbonate play, and Barnhart (Ellenburger) in the Ellenburger Selectively Dolomitized Ramp Carbonate play. The geologic heterogeneity in these reservoirs is being investigated so that we can better understand production constraints that would apply to all reservoirs in that play. For each of these detailed reservoir studies, technologies for further, economically viable, exploitation are being investigated. The information on improved practices in reservoir development will be incorporated into the portfolio.

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List of Acronyms and Abbreviations

Bbbl	Billion barrels
BEG	Bureau of Economic Geology
GIS	Geographic Information System
HPAI	High-pressure air injection
MMbbl	Million barrels
NMBGMR	New Mexico Bureau of Geology and Mineral Resources
OCD	Oil Conservation Division of the New Mexico Energy, Minerals and Natural Resources Department
OOIP	Original oil in place
PUMP	Preferred upstream management practices
RRC	Railroad Commission of Texas
SACROC	Scurry Area Canyon Reef Operators Committee
SEPM	Society for Sedimentary Geology
WAG	Water alternating gas

Appendix A. Oil reservoirs in the Texas part of the Permian Basin having a cumulative production of >1 MMbbl. Reservoirs are in alphabetical order by RRC districts. Production shown for fields that have had others combined into them represents the totals. Combined fields are highlighted.

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
587166	7C	ADAMC	BEND	UPTON	1958	9236	1,289,736
587332	7C	ADAMC	DEVONIAN	UPTON	1953	10490	5,208,779
587498	7C	ADAMC	ELLENBURGER	UPTON	1953	11575	1,162,037
2220900	7C	AMACKER-TIPPET, SW	9100	UPTON	1980	9344	5,264,842
2207380	7C	AMACKER-TIPPETT	ELLENBURGER	UPTON	1953	11890	17,917,650
2207608	7C	AMACKER-TIPPETT	STRAWN	UPTON	1954	9870	1,842,947
2207912	7C	AMACKER-TIPPETT	WOLFCAMP	UPTON	1954	9090	5,567,355
2212111	7C	AMACKER-TIPPETT, S.	BEND	UPTON	1961	9848	6,908,189
2213250	7C	AMACKER-TIPPETT, SE	BEND 10600	UPTON	1966	10637	4,159,301
2220700	7C	AMACKER-TIPPETT, SW	WOLFCAMP	UPTON	1977	9218	16,046,136
2220710	7C	AMACKER-TIPPETT, SW.	WOLFCAMP A	UPTON	1988	9069	4,442,155
2718400	7C	ANDREW A.	CANYON	IRION	1979	7390	3,321,404
3602550	7C	ARLEDGE	PENN SAND	COKE	1974	5270	1,191,965
	7C	ATKINSON, W.	SAN ANGELO	TOM GREEN	1965	816	2,311,838
5143300	7C	BAKER RANCH	CANYON	IRION	1978	7019	2,298,589
5783001	7C	BARNHART		REAGAN	1941	9008	16,446,688
7109500	7C	BENEDUM	FUSSELMAN	UPTON	1966	11110	2,931,937
7109875	7C	BENEDUM	SPRABERRY	UPTON	1947	7593	24,699,962
7919001	7C	BIG LAKE		REAGAN	1923	3000	133,973,558
9450200	7C	BLOCK 42	PENN	UPTON	1956	9450	2,559,545
9521500	7C	BLOCK 49	2450	REAGAN	1955	2456	2,134,823
	7C	BLOODWORTH, NE.	5750 CANYON	NOLAN	1967	8,124	3,710,179
12175852	7C	BRONTE	4800 SAND	COKE	1952	4838	6,075,918
12244075	7C	BROOKS	CANYON K	IRION	1973	6494	1,072,548
14981710	7C	CAMAR	STRAWN-OIL	SCHLEICHER	1959	4324	3,754,255
14988250	7C	CAMAR, SW.	STRAWN	SCHLEICHER	1959	4445	2,117,614
17991500	7C	CHRISTI	CANYON 6800	IRION	1971	6824	1,192,011
18500001	7C	CLARA COUCH		CROCKETT	1941	2186	6,596,133
20101500	7C	CONGER, SW	PENN	REAGAN	1979	8134	2,675,544
20482001	7C	COPE		STERLING	1951	6031	12,672,984
20844500	7C	CORVETTE	WOLFCAMP	UPTON	1991	9388	4,826,776
21766001	7C	CROCKETT		CROCKETT	1938	1571	4,762,786
23380300	7C	DAVIS	ELLENBURGER	UPTON	1950	13050	1,370,746
25930426	7C	DOVE CREEK	CANYON -D-	IRION	1965	6540	3,140,304
25930284	7C	DOVE CREEK	CANYON-C-	TOM GREEN	1965	6497	1,205,124
28393333	7C	ELKHORN	ELLENBURGER	CROCKETT	1951	7185	12,109,347
29292400	7C	ESCONDIDO	FUSSELMAN	CROCKETT	1963	8560	1,060,327
29894333	7C	F & H	CISCO	SCHLEICHER	1958	2612	1,032,823
30243500	7C	FARMER	SAN ANDRES	CROCKETT	1953	2240	28,675,225
31236666	7C	FLAT ROCK	SPRABERRY	UPTON	1951	7245	1,781,814
32142200	7C	FORT TERRETT RANCH	CANYON 2800	SUTTON	1966	2816	3,274,564
32449400	7C	FRADEAN	ELLENBURGER	UPTON	1959	10186	2,154,464
32555666	7C	FRANCO	DEVONIAN	UPTON	1964	10633	1,765,137
36565001	7C	GRAYSON		REAGAN	1928	3050	1,482,688
38156001	7C	HALFF		CROCKETT	1951	1680	3,991,162
40295400	7C	HELUMA	ELLENBURGER	UPTON	1956	10590	4,097,691
40295600	7C	HELUMA	PENN.	UPTON	1956	8030	1,930,528
40296500	7C	HELUMA, EAST	DEVONIAN	UPTON	1973	8740	4,563,131
40300500	7C	HELUMA, SE	DEVONIAN	UPTON	1979	9024	1,613,983
42341500	7C	HOLT RANCH	ELLENBURGER	CROCKETT	1965	7897	2,380,554
43445500	7C	HULLDALE	PENNSYLVANIAN REEF	SCHLEICHER	1950	5772	26,827,284
43447333	7C	HULLDALE, NORTH	PENN. REEF	SCHLEICHER	1951	5690	1,168,869
44042125	7C	I. A. B.	HARRIS SAND	COKE	1970	5275	1,097,186
44042750	7C	I. A. B.	PENN 5070	COKE	1957	5063	1,023,437
44045600	7C	I. A. B., NE.	PENN. 5150	COKE	1961	5192	2,978,833
44717500	7C	IRION 163	ELLEN	IRION	1977	8916	2,605,958
45580666	7C	JAMESON	STRAWN	COKE	1952	5800	43,573,486
46935500	7C	JOHN SCOTT	GRAYBURG	REAGAN	1953	2534	5,505,146
49099500	7C	KETCHUM MT.	CLEAR FORK	IRION	1955	4548	9,226,117
49413200	7C	KING MOUNTAIN	DEVONIAN	UPTON	1956	10459	1,870,050
49413400	7C	KING MOUNTAIN	ELLENBURGER	UPTON	1955	11775	6,890,744
49415545	7C	KING MOUNTAIN, N.	CISCO	UPTON	1975	8764	2,014,219
54590300	7C	LONE JOE DEEP	FUSSELMAN	IRION	1987	9046	8,076,439
58840001	7C	MCCAMEY		UPTON	1925	2100	135,137,987
59560300	7C	MCKAY CREEK	CABALLOS	TERRELL	1979	6238	1,173,298
60698664	7C	MERTZON	SAN ANGELO	IRION	1955	1648	3,430,892
61204875	7C	MIDWAY LANE	1300	CROCKETT	1953	1300	1,712,554
61204500	7C	MIDWAY LANE	PERMIAN	CROCKETT	1956	1124	7,686,681
61204001	7C	MIDWAY LANE		CROCKETT	1947	7596	4,555,520
61269500	7C	MIETHER	GRAYBURG	UPTON	1956	3241	1,049,526
65023666	7C	NEVA, WEST	STRAWN	SCHLEICHER	1951	6217	14,618,884
65674001	7C	NOELKE		CROCKETT	1940	1133	5,595,084
66878333	7C	OHARROW	CANYON	SCHLEICHER	1955	4756	1,248,808
67284001	7C	OLSON		CROCKETT	1940	1828	16,082,538
67768142	7C	OTTO	CANYON	SCHLEICHER	1957	4618	1,173,362
67999333	7C	OZONA, NW.	CANYON	CROCKETT	1963	6675	1,913,927

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
68349001	7C	PAGE		SCHLEICHER	1939	5725	5,121,365
70279125	7C	PEGASUS	DEVONIAN	UPTON	1952	12353	1,442,855
70279250	7C	PEGASUS	ELLENBURGER	UPTON	1949	12530	96,008,159
70279375	7C	PEGASUS	FUSSELMAN	MIDLAND	1958	12100	3,378,847
70279500	7C	PEGASUS	PENNSYLVANIAN	UPTON	1951	10470	17,127,951
70279625	7C	PEGASUS	SAN ANDRES	MIDLAND	1954	5584	11,051,115
70279750	7C	PEGASUS	SPRABERRY	UPTON	1952	8255	16,174,394
73085500	7C	PRICE	GRAYBURG	REAGAN	1953	2410	6,437,211
73243500	7C	PROBANDT	CANYON	TOM GREEN	1975	7169	1,468,833
73468001	7C	PURE-BEAN		CROCKETT	1952	1360	1,876,345
74450300	7C	RAMON	LEONARD	SCHLEICHER	1980	2617	1,177,882
74505500	7C	RANCH	STRAWN	CROCKETT	1953	8156	3,744,987
77622500	7C	ROCK PEN	CANYON	IRION	1976	7145	3,205,731
77622550	7C	ROCK PEN	CLEAR FORK	IRION	1988	3840	1,181,195
77841333	7C	RODMAN-NOEL	GRAYBURG	UPTON	1953	1745	1,143,800
82663568	7C	SHANNON	SAN ANDRES	CROCKETT	1943	2406	12,449,849
83703001	7C	SIMPSON		CROCKETT	1938	1985	1,118,315
83873250	7C	SIXTY SEVEN	CANYON	IRION	1966	6684	1,081,381
83873750	7C	SIXTY SEVEN	STRAWN REEF	IRION	1956	6898	2,867,254
84819850	7C	SOUTHWEST MESA	WOLFCAMP	CROCKETT	1988	6268	1,463,139
85279200	7C	SPRABERRY	TREND AREA	GLASSCOCK	1952	6785	433,832,105
85279400	7C	SPRABERRY	TREND AREA CL. FK.	REAGAN	1955	6194	11,327,959
85447300	7C	SRH	CLEAR FORK	REAGAN	1995	4837	1,266,029
87015881	7C	SUGG RANCH	CANYON	STERLING	1987	7860	7,615,629
	7C	T. D.	6575	TOM GREEN	1982	6592	1,001,559
89134750	7C	TEXEL	PENNSYLVANIAN	UPTON	1954	9143	1,621,367
89198500	7C	TEXON, S	GRAYBURG	REAGAN	1968	3266	1,275,271
89201500	7C	TEXON, W.	SPRABERRY	REAGAN	1964	6923	2,924,301
90007498	7C	TILLERY	PENN.	SCHLEICHER	1953	3568	1,885,797
90188415	7C	TIPPETT	LEONARD, LOWER	CROCKETT	1962	5067	4,979,264
90188001	7C	TIPPETT		CROCKETT	1947	6100	3,627,887
90196666	7C	TIPPETT, W.	WOLFCAMP LO.	CROCKETT	1967	5564	1,365,836
90196333	7C	TIPPETT, WEST	HUECO	CROCKETT	1968	5012	1,469,047
90314400	7C	TODD	SAN ANDRES	CROCKETT	1951	1440	2,183,638
90315333	7C	TODD, DEEP	CRINOIDAL	CROCKETT	1940	5778	41,017,729
90315666	7C	TODD, DEEP	ELLENBURGER	CROCKETT	1940	6232	44,300,279
91424475	7C	TRIUMPH	WOLFCAMP	UPTON	1992	8530	3,362,056
93264001	7C	VAUGHN		CROCKETT	1947	1445	13,265,577
93410710	7C	VELREX	HENDERSON UPPER	SCHLEICHER	1964	6406	1,008,498
95445666	7C	WATER VALLEY	SAN ANDRES	TOM GREEN	1948	1035	4,159,900
95867500	7C	WEGER	SAN ANDRES	CROCKETT	1955	2268	2,934,749
95869001	7C	WEGER, NORTH		CROCKETT	1955	2318	1,173,145
96324500	7C	WENDKIRK	CISCO	COKE	1953	3696	4,559,984
97834500	7C	WILSHIRE	ELLENBURGER	UPTON	1951	11944	41,080,326
97834750	7C	WILSHIRE	PENNSYLVANIAN	UPTON	1952	9810	1,374,833
98796001	7C	WORLD		CROCKETT	1925	2600	45,886,544
98803500	7C	WORLD, WEST	STRAWN	CROCKETT	1954	8190	8,632,607
99023001	7C	WYATT		CROCKETT	1940	1224	1,937,617
99658500	7C	ZAN-ZAN	MID. CANYON	IRION	1988	6014	1,174,262
250750	8	A. W.	FUSSELMAN	WINKLER	1964	9717	1,348,292
292203	8	ABELL	DEVONIAN	CRANE	1953	5245	11,901,722
292580	8	ABELL	PERMIAN 3800	PECOS	1949	3800	1,000,919
292500	8	ABELL	PERMIAN-GENERAL	CRANE	1975	4200	1,658,580
292725	8	ABELL	SILURIAN - MONTOYA, N. W.	CRANE	1962	5110	1,432,119
292667	8	ABELL	SILURIAN-MONTOYA	PECOS	1948	4936	12,619,167
292001	8	ABELL		PECOS	1940	5400	8,106,194
292058	8	ABELL	CLEAR FORK	PECOS	1950	3555	1,043,523
292551	8	ABELL	PERMIAN 2200	PECOS	1949	2200	1,074,575
293625	8	ABELL, EAST	MCKEE	PECOS	1956	5415	2,322,612
293875	8	ABELL, EAST	WADDELL, W. SEG.	PECOS	1957	6090	2,014,539
296500	8	ABELL, NORTHWEST	MCKEE SAND	PECOS	1949	5432	1,435,103
2596200	8	ANDECTOR	ELLENBURGER	ECTOR	1946	8545	177,718,593
2596400	8	ANDECTOR	MCKEE	ECTOR	1948	7635	3,374,471
2596800	8	ANDECTOR	WADDELL	ECTOR	1948	7835	2,029,953
2725500	8	ANDREWS	PENNSYLVANIAN	ANDREWS	1954	9220	15,502,674
2725750	8	ANDREWS	WOLFCAMP	ANDREWS	1953	8596	22,785,915
2725760	8	ANDREWS	WOLFCAMP-PENN.	ANDREWS	1995	9380	3,692,443
2727250	8	ANDREWS, N.	DEVONIAN	ANDREWS	1960	10424	7,844,331
2727500	8	ANDREWS, NORTH	ELLENBURGER	ANDREWS	1959	12349	28,873,225
2727750	8	ANDREWS, NORTH	STRAWN	ANDREWS	1959	9589	3,673,474
2730284	8	ANDREWS, SOUTH	DEVONIAN	ANDREWS	1953	11075	10,316,428
2730852	8	ANDREWS, SOUTH	WOLFCAMP	ANDREWS	1953	9183	15,169,599
3278001	8	APCO-WARNER		PECOS	1939	4600	12,564,506
3520500	8	ARENOSO	STRAWN DETRITUS	WINKLER	1965	8587	22,978,851
3644852	8	ARMER	6350	CRANE	1955	6340	4,779,874
3644568	8	ARMER	TUBB	CRANE	1955	4865	1,441,098
4184666	8	ATAPCO	QUEEN	CRANE	1959	2140	1,351,920
4184333	8	ATAPCO	DEVONIAN	CRANE	1959	5520	1,398,972
4228664	8	ATHEY	WOLFCAMP 10900	PECOS	1967	11263	2,411,926
4605080	8	AZALEA	ATOKA	MIDLAND	1973	10898	2,996,387
4605222	8	AZALEA	DEVONIAN	MIDLAND	1957	11520	1,714,524
4605444	8	AZALEA	GRAYBURG	MIDLAND	1967	4088	2,064,038
4690300	8	B.C.	CANYON	HOWARD	1985	9041	1,226,734

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
5166333	8	BAKKE	DEVONIAN	ANDREWS	1956	10500	17,106,630
5166444	8	BAKKE	ELLENBURGER	ANDREWS	1956	12400	23,722,974
5166555	8	BAKKE	PENN.	ANDREWS	1956	8956	12,336,328
5166888	8	BAKKE	WOLFCAMP	ANDREWS	1956	8492	25,048,339
5524664	8	BAR-MAR	DEV.	CRANE	1965	5258	5,143,157
5524830	8	BAR-MAR	TUBB	CRANE	1965	3962	1,022,337
5859333	8	BARROW	ELLENBURGER	ECTOR	1955	13578	1,436,411
6378284	8	BAYVIEW	GLORIETA	CRANE	1961	3008	2,595,807
6385500	8	BAYVIEW, W.	GLORIETA	CRANE	1965	3023	1,026,923
6671166	8	BEDFORD	DEVONIAN	ANDREWS	1945	8777	19,358,362
6671332	8	BEDFORD	ELLENBURGER	ANDREWS	1950	11018	7,884,926
6671498	8	BEDFORD	FUSSELMAN	ANDREWS	1951	9702	1,854,661
6853333	8	BELDING	YATES	PECOS	1964	2672	1,138,199
8044400	8	BIG SPRING	FUSSELMAN	HOWARD	1955	9589	7,238,047
8735500	8	BLALOCK LAKE, E.	WOLFCAMP	GLASSCOCK	1971	7914	5,978,078
8739500	8	BLALOCK LAKE, S.	WOLFCAMP	GLASSCOCK	1974	8246	10,256,922
8740500	8	BLALOCK LAKE, SE	WOLFCAMP	GLASSCOCK	1981	8245	9,974,801
9230142	8	BLOCK 11	DEVONIAN	ANDREWS	1951	8230	11,110,212
9230426	8	BLOCK 11	FUSSELMAN	ANDREWS	1961	7956	1,069,231
9236333	8	BLOCK 11, SW.	DEVONIAN	ANDREWS	1952	8160	5,113,708
9250400	8	BLOCK 12	ELLENBURGER	ANDREWS	1952	10884	4,705,759
9250001	8	BLOCK 12		ANDREWS	1946	7170	3,003,421
9251333	8	BLOCK 12, EAST	ELLENBURGER	ANDREWS	1953	10117	9,262,118
9288500	8	BLOCK 17, SOUTHEAST	DELAWARE	WARD	1956	5003	1,722,191
9116500	8	BLOCK 2	GRAYBURG	ANDREWS	1957	4736	3,116,332
9358270	8	BLOCK 31	CONNELL	CRANE	1948	10170	1,083,545
9358450	8	BLOCK 31	DEVONIAN	CRANE	1945	8812	223,850,169
9358540	8	BLOCK 31	ELLENBURGER	CRANE	1945	10291	6,266,474
9358630	8	BLOCK 31	GRAYBURG	CRANE	1956	3200	4,918,490
9359250	8	BLOCK 31, EAST	ATOKA	CRANE	1965	8122	1,225,223
9362500	8	BLOCK 31, NW.	PENN UPPER	CRANE	1969	7907	4,489,708
9172250	8	BLOCK 6	DEVONIAN	ANDREWS	1952	12530	4,478,026
9175500	8	BLOCK 6, NE	SILURIAN	ANDREWS	1974	12471	3,623,929
9188250	8	BLOCK 7	DEVONIAN	MARTIN	1950	12280	5,209,687
9202166	8	BLOCK 9	DEVONIAN	ANDREWS	1960	12540	1,540,950
9202332	8	BLOCK 9	ELLENBURGER	ANDREWS	1958	12508	3,542,455
8944750	8	BLOCK A-28	WICHITA-ALBANY	ANDREWS	1964	7463	1,690,793
8958200	8	BLOCK A-34	ELLENBURGER	ANDREWS	1954	13250	4,378,343
8958400	8	BLOCK A-34	GLORIETA	ANDREWS	1955	5910	3,112,350
8958800	8	BLOCK A-34	STRAWN	ANDREWS	1954	9916	1,100,472
8958500	8	BLOCK A-34	SAN ANDRES	ANDREWS	1979	4676	1,120,760
8962500	8	BLOCK A-34, NORTHWEST	GLORIETA	ANDREWS	1955	5914	1,402,909
8990333	8	BLOCK A-49	DEVONIAN	ANDREWS	1965	8637	2,088,379
8990666	8	BLOCK A-49	ELLENBURGER	ANDREWS	1962	11200	1,623,307
10821500	8	BOURLAND	SAN ANDRES	ECTOR	1952	4352	1,125,033
11082333	8	BOYDELL, S.	CLEAR FORK, LO.	ANDREWS	1967	7089	2,325,116
11240500	8	BRADFORD RANCH	ATOKA	MIDLAND	1979	11221	5,717,992
11601500	8	BRAZOS	SAN ANDRES	MIDLAND	1982	4433	1,934,677
11751200	8	BREEDLOVE	SPRABERRY	MARTIN	1962	8350	2,400,927
11751001	8	BREEDLOVE		MARTIN	1951	12078	31,736,195
11752666	8	BREEDLOVE, EAST	SPRABERRY	MARTIN	1962	8180	2,347,842
11756500	8	BREEDLOVE, SOUTH	SPRABERRY	MARTIN	1962	8084	3,979,507
12230333	8	BROOKLAW	CLEAR FORK, LOWER	PECOS	1969	3460	2,195,374
12448200	8	BROWN & THORP	CLEAR FORK	PECOS	1951	3028	6,882,219
12449800	8	BROWN & THORP, EAST	TUBB	PECOS	1965	3125	2,681,183
12763333	8	BRYANT -G-	DEVONIAN	MIDLAND	1979	12002	1,643,736
12978600	8	BUCKWHEAT	SILURO-DEVONIAN	HOWARD	1989	10182	1,488,718
14155001	8	BYRD		WARD	1942	2700	1,148,651
14215250	8	C. C. GUNN	CANYON REEF	HOWARD	1987	7564	1,006,890
15499380	8	CAPRITO	DELAWARE MIDDLE	WARD	1974	6164	5,587,028
14200400	8	C-BAR	SAN ANDRES	CRANE	1949	3520	20,386,507
14200800	8	C-BAR	TUBB	CRANE	1957	5320	2,622,880
17029001	8	CHAPMAN		REEVES	1948	2900	1,578,789
18254600	8	CIRCLE BAR	ELLEN	ECTOR	1962	12758	3,816,623
18593666	8	CLARK	SAN ANDRES	STERLING	1949	890	1,568,965
19113750	8	COAHOMA, N.	FUSSEL	HOWARD	1969	8791	2,778,608
19235700	8	COBRA	WOLFCAMP	GLASSCOCK	1984	7947	10,587,410
19541001	8	COLEMAN RANCH		MITCHELL	1946	2560	10,496,867
19543500	8	COLEMAN RANCH, N.	CLEAR FORK	MITCHELL	1953	3050	4,051,150
19665200	8	COLLIE	DELAWARE	WARD	1981	4725	3,479,423
20004666	8	CONCHO BLUFF	QUEEN	CRANE	1956	4131	8,689,957
20006500	8	CONCHO BLUFF, NORTH	QUEEN	ECTOR	1956	4490	15,394,816
20097700	8	CONGER	PENN	GLASSCOCK	1978	7739	20,406,213
20607001	8	CORDONA LAKE		CRANE	1949	5470	32,578,669
20609666	8	CORDONA LAKE NORTH	TUBB 4500	CRANE	1966	4546	1,061,583
20615500	8	CORDONA LAKE, WEST	DEV.	CRANE	1965	5561	1,490,496
21287250	8	COWDEN	CISCO	ECTOR	1955	8846	6,348,910
21289400	8	COWDEN, NORTH	CLEAR FORK	ECTOR	1970	5239	5,850,903
21289600	8	COWDEN, NORTH	DEEP	ECTOR	1939	5170	69,141,846
21289001	8	COWDEN, NORTH		ECTOR	1930	4400	541,669,047
21289180	8	COWDEN, NORTH	CANYON	ECTOR	1973	9094	1,428,470
21292875	8	COWDEN, SOUTH	13800	ECTOR	1966	13900	2,744,404
21292125	8	COWDEN, SOUTH	CANYON 8790	ECTOR	1966	9202	43,011,248

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
21292250	8	COWDEN, SOUTH	CANYON 8900	ECTOR	1968	8993	13,270,487
21292625	8	COWDEN, SOUTH	ELLENBURGER	ECTOR	1954	12883	5,459,419
21292750	8	COWDEN, SOUTH	PENNSYLVANIAN	ECTOR	1955	8360	1,095,207
21292001	8	COWDEN, SOUTH		ECTOR	1932	5050	161,204,532
21382250	8	COYANOSA	DELAWARE SD.	PECOS	1959	4793	1,327,118
21382875	8	COYANOSA	WOLFCAMP	PECOS	1970	11614	6,299,774
21384666	8	COYANOSA, N.	DELAWARE	PECOS	1966	4809	3,249,484
21517001	8	CRANE COWDEN		CRANE	1932	2550	5,824,566
21577180	8	CRAWAR	DEVONIAN, NORTH	CRANE	1958	6450	6,308,067
21577270	8	CRAWAR	ELLENBURGER	CRANE	1954	8236	1,111,683
21577810	8	CRAWAR	WADDELL	WARD	1955	7645	1,587,021
21577450	8	CRAWAR	GLORIETA	WARD	1954	4040	1,285,530
21597500	8	CREDO	WOLFCAMP, LOWER -B-	STERLING	1962	7430	2,497,526
21597250	8	CREDO	WOLFCAMP	STERLING	1962	7334	3,951,915
21907555	8	CROSSETT	3000 CLEAR FORK	CRANE	1952	2960	3,022,275
21907111	8	CROSSETT	DEVONIAN	CRANE	1944	5440	25,568,056
21912333	8	CROSSETT, S.	DETRITAL	CROCKETT	1965	4924	16,972,491
21912666	8	CROSSETT, S.	DEVONIAN	CROCKETT	1956	5324	17,145,768
23131250	8	DARMER	CANYON	WINKLER	1964	8500	2,323,635
23138500	8	DARMER, NE.	PENN.	WINKLER	1978	8256	1,055,362
23543666	8	DAWSON	DEVONIAN	CRANE	1955	5168	2,165,509
23907142	8	DEEP ROCK	DEVONIAN	ANDREWS	1963	10063	1,713,689
23907284	8	DEEP ROCK	ELLENBURGER	ANDREWS	1954	12252	14,245,387
23907568	8	DEEP ROCK	GLORIETA 5950	ANDREWS	1954	5700	13,186,510
23907710	8	DEEP ROCK	PENN.	ANDREWS	1961	9037	7,857,006
24396100	8	DESPERADO	ATOKA	MIDLAND	1984	10845	3,642,912
24488650	8	DEWEY LAKE	WOLFCAMP	GLASSCOCK	1982	8449	1,395,910
24489380	8	DEWEY LAKE, S.	STRAWN	GLASSCOCK	1983	10055	1,115,433
24853400	8	DIMMITT	CHERRY CANYON	LOVING	1980	6226	8,574,522
25188200	8	DOLLARHIDE	CLEAR FORK	ANDREWS	1949	6545	47,270,501
25188400	8	DOLLARHIDE	DEVONIAN	ANDREWS	1955	8051	97,596,076
25188600	8	DOLLARHIDE	ELLENBURGER	ANDREWS	1947	10137	26,460,708
25188800	8	DOLLARHIDE	SILURIAN	ANDREWS	1947	8345	40,980,095
25189200	8	DOLLARHIDE, EAST	DEVONIAN	ANDREWS	1949	10186	9,284,134
25189400	8	DOLLARHIDE, EAST	ELLENBURGER	ANDREWS	1959	12610	6,432,601
25189600	8	DOLLARHIDE, EAST	SILURIAN	ANDREWS	1949	11000	1,337,356
25347750	8	DONNELLY	HOLT	ECTOR	1950	5275	1,710,117
25347875	8	DONNELLY	SAN ANDRES	ECTOR	1950	4305	8,423,063
25395100	8	DORA ROBERTS	CONSOLIDATED	MIDLAND	1995	10341	2,371,206
25395166	8	DORA ROBERTS	DEVONIAN	MIDLAND	1955	12010	2,528,808
25395332	8	DORA ROBERTS	ELLENBURGER	MIDLAND	1954	12835	50,731,918
25501500	8	DORR	QUEEN SAND	WARD	1955	2291	1,045,088
25742500	8	DOUBLE -H-	GRAYBURG	ECTOR	1955	4456	4,217,866
26538830	8	DUNE	WOLFCAMP	CRANE	1957	7710	7,564,044
26538001	8	DUNE		CRANE	1938	3270	192,685,765
27739001	8	EDWARDS		ECTOR	1935	3400	9,431,134
27779500	8	EDWARDS -04-, S.	7900	CRANE	1967	7925	2,312,280
27746500	8	EDWARDS, WEST	CANYON	ECTOR	1970	8962	23,979,851
28019500	8	EL MAR	DELAWARE	LOVING	1959	4532	18,927,176
28843888	8	EMBAR	5600	ANDREWS	1955	5606	6,368,089
28843111	8	EMBAR	DEVONIAN	ANDREWS	1954	9346	1,335,402
28843222	8	EMBAR	ELLENBURGER	ANDREWS	1942	7977	22,646,307
28843666	8	EMBAR	PERMIAN	ANDREWS	1942	6280	6,779,777
28899166	8	EMMA	DEVONIAN	ANDREWS	1954	10192	5,753,019
28899249	8	EMMA	ELLENBURGER	ANDREWS	1953	13307	54,500,181
28899332	8	EMMA	FUSSELMAN	ANDREWS	1954	11288	1,933,151
28899415	8	EMMA	GLORIETA	ANDREWS	1953	5405	3,630,701
28899747	8	EMMA	STRAWN	ANDREWS	1958	9123	3,239,757
28899001	8	EMMA		ANDREWS	1939	4300	20,813,110
28961568	8	EMPEROR	HOLT	WINKLER	1946	4765	9,475,152
28962001	8	EMPEROR, DEEP		WINKLER	1935	3000	11,773,170
28963500	8	EMPEROR, EAST	CLEAR FORK, LO.	WINKLER	1962	6097	1,131,119
29507500	8	ESTES BLOCK 34	PENN.	WARD	1957	8150	4,999,188
30394375	8	FASKEN	ELLENBURGER	ANDREWS	1953	12604	3,641,104
30394500	8	FASKEN	PENN.	ECTOR	1956	10158	5,955,633
30394750	8	FASKEN	WOLFCAMP	ANDREWS	1952	8571	7,451,167
30394875	8	FASKEN	WOLFCAMP, NORTH	ANDREWS	1956	8290	1,343,663
30398500	8	FASKEN, S.	FUSSELMAN	ECTOR	1957	12270	1,655,361
30398875	8	FASKEN, SOUTH	WOLFCAMP	ECTOR	1960	8475	1,298,246
31768333	8	FLYING -W-	ELLEN	WINKLER	1970	11768	1,003,126
31768666	8	FLYING -W-	WOLFCAMP	WINKLER	1955	8190	1,525,905
31768001	8	FLYING -W-		WINKLER	1949	9660	1,944,700
31908500	8	FORD, EAST	DELAWARE SAND	REEVES	1963	2730	3,401,021
31913500	8	FORD, WEST	4100	CULBERSON	1963	4143	3,010,344
32124625	8	FORT STOCKTON	YATES LOWER	PECOS	1943	3072	1,770,005
32124001	8	FORT STOCKTON		PECOS	1944	2892	34,386,845
32309001	8	FOSTER		ECTOR	1935	4300	284,565,604
32344800	8	FOUR C	SAN ANDRES	PECOS	1975	2302	1,110,536
33158250	8	FUHRMAN	GLORIETA	ANDREWS	1950	5612	11,248,689
33176284	8	FUHRMAN-MASCHO	DEVONIAN	ANDREWS	1956	10000	1,835,504
33176001	8	FUHRMAN-MASCHO		ANDREWS	1930	4700	119,367,788
33230900	8	FULLERTON	8500	ANDREWS	1944	8658	51,119,358
33230300	8	FULLERTON	DEVONIAN	ANDREWS	1987	8276	2,734,646

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
33230400	8	FULLERTON	ELLENBURGER	ANDREWS	1945	9945	2,067,603
33230500	8	FULLERTON	SAN ANDRES	ANDREWS	1945	4785	39,796,567
33230001	8	FULLERTON		ANDREWS	1941	7300	309,506,748
33231250	8	FULLERTON, EAST	ELLEN.	ANDREWS	1967	11428	1,236,825
33232510	8	FULLERTON, NORTH	ELLENBURGER	ANDREWS	1991	9872	1,054,548
33235250	8	FULLERTON, SOUTH	ELLENBURGER	ANDREWS	1948	10600	13,774,543
33235750	8	FULLERTON, SOUTH	WOLFCAMP	ANDREWS	1955	8245	4,217,011
33989001	8	GARDEN CITY		GLASSCOCK	1946	9740	1,128,766
34001750	8	GARDEN CITY, W.	WOLFCAMP 7880	GLASSCOCK	1966	7920	3,479,124
34529666	8	GERALDINE	FORD	REEVES	1957	2557	30,222,300
34529200	8	GERALDINE	DELAWARE 3400	CULBERSON	1982	3454	1,598,553
34563400	8	GERMANIA	GRAYBURG	MIDLAND	1952	3940	5,351,696
35197333	8	GLASCO	DEVONIAN	ANDREWS	1953	12543	21,207,037
35197380	8	GLASCO	ELLENBURGER	ANDREWS	1985	13806	2,830,825
35652868	8	GOLDSMITH	5600	ECTOR	1947	5600	240,096,410
35652062	8	GOLDSMITH	CLEAR FORK	ECTOR	1946	6300	93,193,807
35652186	8	GOLDSMITH	DEVONIAN	ECTOR	1948	7875	15,171,587
35652248	8	GOLDSMITH	ELLENBURGER	ECTOR	1947	9495	2,136,727
35652310	8	GOLDSMITH	FIGURE 5 DEVONIAN	ECTOR	1956	7760	1,358,571
35652434	8	GOLDSMITH	FUSSELMAN	ECTOR	1954	7763	4,696,451
35652558	8	GOLDSMITH	HOLT	ECTOR	1952	5106	2,298,769
35652001	8	GOLDSMITH		ECTOR	1935	4300	357,953,213
35653777	8	GOLDSMITH, E.	PENNSYLVANIAN	ECTOR	1953	8621	1,655,075
35653333	8	GOLDSMITH, EAST	GLORIETA	ECTOR	1955	5136	1,360,016
35653666	8	GOLDSMITH, EAST	HOLT	ECTOR	1954	4988	8,214,446
35653888	8	GOLDSMITH, EAST	SAN ANDRES	ECTOR	1962	4224	9,088,613
35654166	8	GOLDSMITH, N.	DEVONIAN	ECTOR	1946	7900	9,021,147
35654332	8	GOLDSMITH, N.	ELLENBURGER	ECTOR	1954	8896	5,595,412
35654664	8	GOLDSMITH, N.	SAN ANDRES, CON.	ECTOR	1964	4500	22,178,175
35654830	8	GOLDSMITH, N.	SILURIAN	ECTOR	1948	8255	1,524,694
35659125	8	GOLDSMITH, W.	CLEAR FORK, UP.	ECTOR	1956	5640	9,675,776
35659375	8	GOLDSMITH, W.	ELLENBURGER	ECTOR	1954	9428	4,018,423
35659625	8	GOLDSMITH, W.	SAN ANDRES	ECTOR	1956	4280	6,843,367
35659500	8	GOLDSMITH, W.	FUSSELMAN	ECTOR	1955	8294	2,672,229
35708670	8	GOMEZ	WOLFCAMP UPPER	PECOS	1977	10620	1,227,066
36924500	8	GRICE	DELAWARE	LOVING	1956	4510	10,207,517
37821710	8	H. S. A.	PENNSYLVANIAN	WARD	1960	8088	3,516,869
37821900	8	H. S. A.	SAN ANDRES	WARD	1979	4485	1,491,427
38227333	8	HALLANAN	STRAWN	MIDLAND	1952	10570	4,202,854
38255116	8	HALLEY	CLEAR FORK	WINKLER	1961	5162	2,881,280
38255174	8	HALLEY	DEVONIAN	WINKLER	1956	9884	3,425,981
38255406	8	HALLEY	GLORIETA	WINKLER	1957	5006	4,333,697
38255464	8	HALLEY	MONTOYA	WINKLER	1956	10350	2,969,405
38255001	8	HALLEY		WINKLER	1939	3150	44,608,756
38260664	8	HALLEY, SOUTH	QUEEN SAND	WINKLER	1960	3113	4,788,167
39176332	8	HARPER	DEVONIAN	ECTOR	1962	10005	10,515,508
39176498	8	HARPER	ELLENBURGER	ECTOR	1962	12436	23,900,923
39176830	8	HARPER	STRAWN	ECTOR	1962	9028	1,014,517
39176001	8	HARPER		ECTOR	1933	4300	50,261,732
39176690	8	HARPER	GLORIETA	ECTOR	1988	5500	1,118,476
39182666	8	HARPER, SE.	ELLEN.	ECTOR	1965	12505	1,829,238
39969400	8	HEADLEE	DEVONIAN	ECTOR	1953	11756	14,167,925
39969600	8	HEADLEE	ELLENBURGER	ECTOR	1953	13106	38,326,414
39971500	8	HEADLEE, N.	DEVONIAN	ECTOR	1956	12210	6,195,590
40354001	8	HENDERSON		WINKLER	1936	3030	16,617,751
40406001	8	HENDRICK		WINKLER	1926	3100	265,038,391
40752500	8	HERRELL, EAST	QUEEN SAND	STERLING	1953	1454	4,793,966
42971166	8	HOWARD GLASSCOCK	CLEAR FORK,MI	HOWARD	1970	3705	6,808,390
42971001	8	HOWARD GLASSCOCK		HOWARD	1925	3200	403,182,614
42971332	8	HOWARD-GLASSCOCK	GLORIETA	HOWARD	1925	3200	39,431,415
42971664	8	HOWARD-GLASSCOCK	WOLFCAMP 7400	HOWARD	1970	7441	6,178,414
43106200	8	HUBBARD	CHERRY CANYON	LOVING	1982	5286	1,145,161
43878600	8	HUTEX	DEAN	ANDREWS	1959	9595	2,273,165
43878800	8	HUTEX	DEVONIAN	ANDREWS	1953	12509	48,354,343
43926600	8	HUTTO, SOUTH	WOLFCAMP	HOWARD	1964	7421	3,330,447
44147500	8	IATAN	SAN ANDRES	MITCHELL	1957	2364	2,350,479
44148500	8	IATAN, EAST HOWARD		HOWARD	1926	2700	168,656,507
44149001	8	IATAN, NORTH		HOWARD	1943	2908	3,791,827
44521350	8	INEZ	DEEP	ANDREWS	1989	11500	4,349,034
44521498	8	INEZ	ELLENBURGER	ANDREWS	1961	12505	16,436,191
45582200	8	JAMESON N.	ELLEN	MITCHELL	1978	7157	1,602,269
45582666	8	JAMESON, NORTH	STRAWN	MITCHELL	1953	5866	9,622,521
45680500	8	JANELLE, SE.	TUBB	WARD	1962	5344	4,843,708
46296300	8	JESS BURNER	DELAWARE 3800	REEVES	1982	3802	2,828,941
47007380	8	JOHNSON	GLORIETA	ECTOR	1973	5452	8,122,905
47007400	8	JOHNSON	HOLT	ECTOR	1973	5303	12,446,922
47007600	8	JOHNSON	PENN	ECTOR	1973	9261	1,132,603
47007001	8	JOHNSON		ECTOR	1934	4200	35,981,707
47267076	8	JORDAN	CONNELL SAND	ECTOR	1948	8830	4,445,230
47267228	8	JORDAN	ELLENBURGER	ECTOR	1947	8914	31,726,443
47267304	8	JORDAN	FUSSELMAN	ECTOR	1951	7420	1,704,012
47267456	8	JORDAN	PENNSYLVANIAN	CRANE	1953	7830	2,104,294
47267608	8	JORDAN	TUBB	ECTOR	1948	5250	3,416,506

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
47267001	8	JORDAN		CRANE	1937	3700	90,771,561
48754500	8	KEN REGAN	DELAWARE	REEVES	1954	3350	4,370,922
49038071	8	KERMIT	ELLENBURGER	WINKLER	1943	10744	5,521,825
49038001	8	KERMIT		WINKLER	1928	2800	111,012,043
49043333	8	KERMIT, SE.	TUBB	WINKLER	1965	6211	1,012,432
49042250	8	KERMIT, SOUTH	DEVONIAN-OIL	WINKLER	1957	8220	9,656,276
49129066	8	KEYSTONE	CLEAR FORK	WINKLER	1958	5739	5,291,790
49129132	8	KEYSTONE	COLBY	WINKLER	1939	3300	75,325,366
49129198	8	KEYSTONE	DEVONIAN	WINKLER	1946	8040	15,403,476
49129330	8	KEYSTONE	ELLENBURGER	WINKLER	1943	9524	146,847,044
49129396	8	KEYSTONE	HOLT	WINKLER	1943	4800	44,955,406
49129594	8	KEYSTONE	SAN ANDRES	WINKLER	1960	4465	4,308,999
49129660	8	KEYSTONE	SILURIAN	WINKLER	1955	8500	30,949,283
49133001	8	KEYSTONE, SOUTH		WINKLER	1958	6470	3,276,871
49138100	8	KEYSTONE, SW.	SAN ANDRES	WINKLER	1981	4446	1,306,447
49411500	8	KING LAKE	ELLENBURGER	ECTOR	1988	11082	2,059,844
51152500	8	LACAFF	DEAN	MARTIN	1969	9490	8,111,254
52497333	8	LAWSON	SAN ANDRES	ECTOR	1950	4320	16,068,261
52567500	8	LAZY R	STRAWN DETRITUS	ECTOR	1963	8307	1,211,321
52624200	8	LEA	CONNELL	CRANE	1953	8178	3,431,877
52624300	8	LEA	ELLENBURGER	CRANE	1953	8165	20,496,500
52624800	8	LEA	SAN ANDRES	CRANE	1955	3075	10,167,344
52624900	8	LEA	TUBB	CRANE	1955	4448	1,842,206
53000830	8	LEHN-APCO	1600	PECOS	1939	1700	3,296,731
53002666	8	LEHN-APCO, NORTH	1600	PECOS	1946	1945	3,200,802
53009500	8	LEHN-APCO, SOUTH	ELLEN	PECOS	1977	4740	1,210,952
53989250	8	LITTLE JOE	DELAWARE	WINKLER	1965	5034	1,728,191
54116500	8	LITTMAN	SAN ANDRES	ANDREWS	1951	4313	1,390,768
55256284	8	LOWE	ELLENBURGER	ANDREWS	1957	13314	11,896,530
55256710	8	LOWE	SILURIAN	ANDREWS	1953	12818	14,948,341
55818333	8	LUTHER, NORTH	CANYON REEF	HOWARD	1952	7950	1,789,764
55822500	8	LUTHER, SE.	SILURIAN-DEVONIAN	HOWARD	1953	9855	28,797,594
55953250	8	LYLES	CLEAR FORK	CRANE	1970	3170	2,423,992
56082500	8	M.A.K.	SPRABERRY	MARTIN	1963	8501	1,995,628
56159200	8	M.F.E.	GRAYBURG	ANDREWS	1991	4936	3,556,164
56378001	8	MABEE		ANDREWS	1943	4704	115,007,221
56761001	8	MAGNOLIA SEALY		WARD	1939	3000	5,774,660
56766001	8	MAGNOLIA SEALY, SOUTH		WARD	1940	2847	3,580,223
56822125	8	MAGUTEX	DEVONIAN	ANDREWS	1953	12504	48,627,371
56822250	8	MAGUTEX	ELLENBURGER	ANDREWS	1952	13840	17,610,065
56822625	8	MAGUTEX	QUEEN	ANDREWS	1958	4862	4,868,087
56949500	8	MALICKY	QUEEN SAND	PECOS	1949	1964	3,604,412
57324650	8	MARALO	WOLFCAMP	PECOS	1984	11055	1,200,187
57774275	8	MARTIN	CONSOLIDATED	ANDREWS	2000	7490	8,977,662
57774332	8	MARTIN	ELLENBURGER	ANDREWS	1946	8400	36,536,319
57774498	8	MARTIN	MCKEE	ANDREWS	1945	8300	6,816,298
57774581	8	MARTIN	SAN ANDRES	ANDREWS	1945	4300	2,920,470
57774664	8	MARTIN	TUBB	ANDREWS	1955	6260	2,115,646
58099001	8	MASON		LOVING	1937	3900	3,020,075
58101500	8	MASON, N.	DELAWARE SAND	LOVING	1952	4055	6,709,456
58164001	8	MASTERSON		PECOS	1929	1500	2,723,125
59304250	8	MCDOWELL	SAN ANDRES	GLASSCOCK	1964	2341	2,526,387
59337001	8	MCELROY		CRANE	1926	2900	569,725,971
59339500	8	MCELROY, NORTH	ELLENBURGER	CRANE	1973	12024	3,430,675
59339700	8	MCELROY, NORTH	SILURIAN	CRANE	1973	11049	1,015,002
59419166	8	MCFARLAND	ELLENBURGER	ANDREWS	1961	13898	5,636,171
59419498	8	MCFARLAND	PENNSYLVANIAN	ANDREWS	1956	10423	5,053,412
59419664	8	MCFARLAND	QUEEN	ANDREWS	1955	4790	42,782,895
59419830	8	MCFARLAND	WOLFCAMP	ANDREWS	1955	9134	8,558,308
59420500	8	MCFARLAND, EAST	QUEEN	ANDREWS	1955	4789	2,560,021
59563333	8	MCKEE	CLEAR FORK, LOWER	CRANE	1950	4050	1,078,221
60137500	8	MEANS	QUEEN SAND	ANDREWS	1954	4024	39,045,231
60137001	8	MEANS		ANDREWS	1934	4400	232,243,704
60138500	8	MEANS, EAST	STRAWN	ANDREWS	1954	10616	4,041,930
60139500	8	MEANS, N.	QUEEN SAND	GAINES	1955	4341	8,270,696
60142750	8	MEANS, SOUTH	WOLFCAMP	ANDREWS	1956	9378	7,257,075
60873426	8	METZ	GLORIETTA	ECTOR	1959	4426	1,802,537
60874500	8	METZ, EAST	ELLENBURGER	ECTOR	1961	9046	2,984,224
61046250	8	MIDDLETON	CANYON REEF	HOWARD	1986	8536	1,285,697
61118332	8	MIDLAND FARMS	ELLENBURGER	ANDREWS	1952	12672	50,853,026
61118830	8	MIDLAND FARMS	WOLFCAMP	ANDREWS	1954	9539	15,397,011
61118001	8	MIDLAND FARMS		ANDREWS	1945	4800	161,255,366
61130001	8	MIDLAND FARMS DEEP		ANDREWS	1986	11924	13,227,411
61121666	8	MIDLAND FARMS, NE.	ELLENBURGER	ANDREWS	1953	12540	7,643,557
61120500	8	MIDLAND FARMS, NORTH	GRAYBURG	ANDREWS	1953	4943	16,927,251
61119333	8	MIDLAND FARMS,E	GRAYBURG UPPER	ANDREWS	1969	4780	2,460,219
61143400	8	MID-MAR, EAST	FUSSELMAN	MIDLAND	1982	11711	2,750,895
61473500	8	MILLER BLOCK B-29	PENN.	WARD	1959	8104	2,737,993
62415083	8	MONAHANS	CLEAR FORK	WARD	1945	4750	19,445,953
62415332	8	MONAHANS	ELLENBURGER	WARD	1942	10550	5,318,009
62415415	8	MONAHANS	FUSSELMAN	WARD	1954	8336	1,262,546
62415747	8	MONAHANS	QUEEN SAND	WARD	1960	3269	6,505,467
62416666	8	MONAHANS, E.	PENN., LO.	WINKLER	1964	8873	1,325,184

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
62417360	8	MONAHANS, N.	ELLENBURGER	WINKLER	1955	11990	8,663,172
62418666	8	MONAHANS, NE.	PENN DETRITAL, UP	WINKLER	1968	8128	3,878,539
62417110	8	MONAHANS, NORTH	CLEARFORK	WINKLER	1987	5610	1,146,607
62417270	8	MONAHANS, NORTH	DEVONIAN	WINKLER	1955	9447	6,347,324
62417450	8	MONAHANS, NORTH	FUSSELMAN	WINKLER	1957	10026	1,944,511
62417630	8	MONAHANS, NORTH	MONTOYA	WINKLER	1956	10080	1,036,863
62420666	8	MONAHANS, SOUTH	QUEEN	WARD	1961	3108	8,027,310
62494001	8	MONROE		WARD	1931	4600	4,146,637
62703200	8	MOONLIGHT	ELLENBURGER	MIDLAND	1983	13325	1,014,717
62703400	8	MOONLIGHT	MISSISSIPPIAN	MIDLAND	1984	11599	1,162,891
62711300	8	MOORE	DEEP FSLM	HOWARD	1982	10032	5,073,129
62711001	8	MOORE		HOWARD	1937	3200	15,258,997
62781500	8	MOOSE	QUEEN	ECTOR	1958	4512	9,078,764
63143500	8	MOSS	GRAYBURG	ECTOR	1955	3543	1,627,164
64890500	8	NELSON	ELLENBURGER	ANDREWS	1946	10384	5,070,077
64890750	8	NELSON	WICHITA	ANDREWS	1948	7160	2,354,254
64995001	8	NETTERVILLE		PECOS	1934	2400	3,325,351
65567300	8	NIX	CLEARFORK	ANDREWS	1989	7036	2,269,877
65572001	8	NIX, SOUTH		ANDREWS	1954	7386	3,279,283
65766111	8	NOLLEY	CANYON	ANDREWS	1967	10384	2,131,200
65766333	8	NOLLEY	DEVONIAN	ANDREWS	1967	12311	4,321,428
65766444	8	NOLLEY	ELLEN.	ANDREWS	1968	13939	2,678,693
65766888	8	NOLLEY	WOLFCAMP	ANDREWS	1951	9227	30,459,183
65967400	8	NORMAN	DEVONIAN	GAINES	1961	12214	7,734,263
65967600	8	NORMAN	ELLENBURGER	GAINES	1970	13865	2,195,849
66588001	8	OATES		PECOS	1947	790	1,595,709
66669500	8	OCEANIC	PENNSYLVANIAN	HOWARD	1953	8140	24,059,565
66672500	8	OCEANIC, N.E.	PENNSYLVANIAN	BORDEN	1968	8135	1,495,837
67074500	8	OLDS	DELAWARE	REEVES	1958	3029	1,340,153
67604500	8	ORLA, SOUTH	DELAWARE SAND	REEVES	1953	3562	1,044,747
68222080	8	P&P	DEVONIAN	CRANE	1995	5508	1,375,704
69193426	8	PARKER	GRAYBURG, SAN ANDRES	ANDREWS	1935	4800	4,322,184
69193568	8	PARKER	PENNSYLVANIAN	ANDREWS	1954	9087	8,334,854
69193710	8	PARKER	WOLFCAMP	ANDREWS	1953	8554	5,501,626
69200500	8	PARKER, WEST	PENN.	ANDREWS	1967	9046	1,151,180
69233498	8	PARKS	PENNSYLVANIAN	MIDLAND	1950	10440	15,249,943
69233664	8	PARKS	SPRABERRY	MIDLAND	1957	7770	7,815,355
69233400	8	PARKS	FUSSELMAN-MONTOYA	MIDLAND	1983	12405	1,143,084
69351166	8	PAROCHIAL-BADE	CLEAR FORK	STERLING	1954	2211	4,764,467
69351498	8	PAROCHIAL-BADE	QUEEN SAND	STERLING	1951	1103	2,031,854
69873001	8	PAYTON		PECOS	1938	2000	14,835,765
70129348	8	PECOS VALLEY	DEVONIAN 5400	PECOS	1953	5771	8,388,267
70129580	8	PECOS VALLEY	HIGH GRAVITY	PECOS	1928	1800	20,014,222
70129638	8	PECOS VALLEY	LOW GRAVITY	PECOS	1928	1600	6,747,210
70129812	8	PECOS VALLEY	PERMIAN, LOWER	PECOS	1956	5140	3,236,057
70537924	8	PENWELL	4500	ECTOR	1948	4410	2,805,483
70537066	8	PENWELL	CLEAR FORK	ECTOR	1953	4996	1,878,499
70537330	8	PENWELL	ELLENBURGER	ECTOR	1946	8888	14,203,574
70537396	8	PENWELL	FUSSELMAN	ECTOR	1953	7490	1,848,684
70537462	8	PENWELL	GLORIETA	ECTOR	1953	4420	7,345,775
70537001	8	PENWELL		ECTOR	1926	3800	100,075,474
70661300	8	PERRIWINKLE	CANYON	MARTIN	1985	9420	1,062,980
71267500	8	PHOENIX	GRAYBURG	MARTIN	1972	3930	4,620,068
71542400	8	PINAL DOME	CHERRY CANYON	LOVING	1984	6485	1,432,297
72810500	8	POWELL	8300	GLASSCOCK	1982	8552	2,181,282
73103666	8	PRICHARD	ELLENBURGER	ANDREWS	1953	13475	1,061,819
73167500	8	PRIEST & BEAVERS	QUEEN	PECOS	1957	2180	2,387,501
73926500	8	QUITO	DELAWARE SAND	WARD	1953	4934	2,444,299
73933500	8	QUITO, WEST	DELAWARE	WARD	1955	4732	5,329,219
74793333	8	RATLIFF	ELLENBURGER	ECTOR	1954	13559	3,368,635
76184333	8	RHODA WALKER	CANYON 5900	WARD	1967	6192	17,234,663
74041100	8	RK	DEVONIAN	MARTIN	1975	11815	21,538,949
77247600	8	ROBERDEAU	CLEAR FORK, UPPER	CRANE	1963	3000	2,149,749
77252111	8	ROBERDEAU, S.	CLEAR FORK LOWER	CRANE	1965	3330	1,184,878
77252888	8	ROBERDEAU, S.	TUBB	CRANE	1967	3321	2,161,929
77953250	8	ROJO CABALLOS	DELAWARE	PECOS	1962	5253	1,097,828
78279300	8	ROSE CREEK, N	WOLFCAMP	STERLING	1982	5084	1,582,370
78936600	8	RUNNING W	TUBB	CRANE	1962	4340	1,197,246
78936800	8	RUNNING W	WADDELL	CRANE	1954	6148	25,266,119
78938500	8	RUNNING W, N.	HOLT	CRANE	1964	4008	1,093,983
79131666	8	RUWE-COB	PENN REEF	HOWARD	1967	7424	1,207,162
79423500	8	SABRE	DELAWARE	REEVES	1958	2968	5,913,660
79659700	8	SAINT LAWRENCE	STRAWN	GLASSCOCK	1983	9890	1,469,268
80473248	8	SAND HILLS	JUDKINS	CRANE	1960	3000	12,616,500
80473310	8	SAND HILLS	MCKNIGHT	CRANE	1944	3420	128,500,389
80473372	8	SAND HILLS	ORDOVICIAN	CRANE	1936	6300	13,143,342
80473620	8	SAND HILLS	SAN ANGELO, UPPER	CRANE	1963	3618	3,375,873
80473682	8	SAND HILLS	TUBB	CRANE	1930	4500	102,067,768
80473868	8	SAND HILLS	WOLFCAMP	CRANE	1958	5684	2,537,187
80474500	8	SAND HILLS, EAST	ELLENBURGER	CRANE	1968	5703	2,253,367
80475500	8	SAND HILLS, N.	ELLENBURGER	CRANE	1957	6030	1,177,511
80481001	8	SAND HILLS, WEST		CRANE	1943	3883	2,899,960
81021250	8	SARA-MAG	CANYON REEF	HOWARD	1954	7580	3,937,283

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
81392001	8	SCARBOROUGH		WINKLER	1927	3200	37,034,546
81394001	8	SCARBOROUGH, NORTH		WINKLER	1947	3286	3,443,096
81738200	8	SCOTT	CHERRY CANYON	REEVES	1978	6134	1,013,358
81738250	8	SCOTT	DELAWARE	WARD	1946	4239	5,416,369
81821333	8	SCREWBEAN, NE.	DELAWARE	REEVES	1961	2519	1,224,697
81952500	8	SEALY, SOUTH	YATES	WARD	1946	2700	1,229,767
82275500	8	SERIO	GRAYBURG	ANDREWS	1970	4806	4,834,677
82570100	8	SHAFTER LAKE	CLEAR FORK	ANDREWS	1948	6910	10,252,003
82570200	8	SHAFTER LAKE	DEVONIAN	ANDREWS	1947	9425	27,459,338
82570300	8	SHAFTER LAKE	ELLENBURGER	ANDREWS	1948	11685	6,629,516
82570500	8	SHAFTER LAKE	SAN ANDRES	ANDREWS	1953	4482	49,810,814
82570600	8	SHAFTER LAKE	WOLFCAMP	ANDREWS	1951	8405	12,195,348
82570700	8	SHAFTER LAKE	YATES	ANDREWS	1952	3054	1,951,628
82572666	8	SHAFTER LAKE, N.	SAN ANDRES	ANDREWS	1952	4559	1,231,741
82822001	8	SHEARER		PECOS	1938	1400	4,684,529
82864664	8	SHEFFIELD	ELLENBURGER	PECOS	1952	9272	2,366,006
83292500	8	SHIPLEY	QUEEN SAND	WARD	1928	3075	29,037,233
83977500	8	SLATOR	SAN ANDRES	ECTOR	1957	4172	2,416,337
84257333	8	SMITH	CLEAR FORK	ANDREWS	1950	7340	1,213,636
84469001	8	SNYDER		HOWARD	1937	2800	43,595,719
85104001	8	SPENCER		WARD	1941	2900	3,071,702
85280300	8	SPRABERRY	TREND AREA	MIDLAND	1952	8000	489,365,061
85280400	8	SPRABERRY	TREND AREA CL. FK.	MIDLAND	1955	7000	3,375,768
85280500	8	SPRABERRY	TREND AREA DEAN-WLFCP	GLASSCOCK	1966	9022	10,704,270
87018550	8	SUGG RANCH	CANYON DIST 08	STERLING	1987	7860	6,483,258
87025500	8	SULLIVAN	DELAWARE	REEVES	1957	2665	1,861,453
87073333	8	SULPHUR DRAW	DEAN 8790	MARTIN	1966	9442	13,147,477
87143500	8	SUN VALLEY	TUBB, LOWER	PECOS	1969	3272	1,874,552
87145500	8	SUN VALLEY, N.	TUBB, LOWER	PECOS	1969	3363	1,261,965
87599284	8	SWEETIE PECK	ELLENBURGER	MIDLAND	1950	13128	10,038,376
87599568	8	SWEETIE PECK	PENNSYLVANIAN	MIDLAND	1960	10342	2,158,236
88071928	8	T X L	WOLFCAMP, NORTH	ECTOR	1959	7535	4,584,422
88073500	8	T X L, NORTH	WADDELL	ECTOR	1961	9386	2,716,712
88562001	8	TAYLOR LINK		PECOS	1929	1800	15,896,612
88567700	8	TAYLOR LINK W.	SAN ANDRES	PECOS	1984	1800	1,640,304
89408205	8	THISTLE	CABALLOS NOVACULITE	PECOS	1984	2679	1,291,062
89690250	8	THREE BAR	DEVONIAN	ANDREWS	1945	8385	41,023,054
90286001	8	TOBORG		PECOS	1929	500	43,045,830
90781200	8	TORO	DELAWARE	REEVES	1961	5158	1,059,893
91336498	8	TRIPLE M	WOLFCAMP UPPER	STERLING	1963	6746	3,109,333
91350100	8	TRIPLE-N	DEVONIAN	ANDREWS	1957	10600	1,072,723
91350300	8	TRIPLE-N	GRAYBURG	ANDREWS	1964	4338	8,690,502
91350600	8	TRIPLE-N	PENN., UPPER	ANDREWS	1958	8912	16,084,222
91450333	8	TROPORO	DEVONIAN	CRANE	1957	5404	5,576,672
91455500	8	TROPORO, N	DEVONIAN	CRANE	1979	5555	1,261,495
91630001	8	TUCKER		CRANE	1946	5770	2,241,122
91803200	8	TUNIS CREEK	DEVONIAN	PECOS	1982	6835	3,607,730
91817001	8	TUNSTILL		REEVES	1947	3270	12,199,635
91818500	8	TUNSTILL, EAST	DELAWARE	LOVING	1959	3652	2,870,757
91903333	8	TURNER-GREGORY	CLEAR FORK	MITCHELL	1955	2668	10,555,530
92141333	8	TWOFREDS	DELAWARE	LOVING	1957	4895	14,599,875
88071174	8	TXL	DEVONIAN	ECTOR	1944	8050	58,747,516
88071232	8	TXL	DEVONIAN-MAIN PAY G	ECTOR	1970	8075	2,465,157
88071290	8	TXL	ELLENBURGER	ECTOR	1949	9600	129,551,707
88071522	8	TXL	PENNSYLVANIAN	ECTOR	1956	8450	1,045,392
88071580	8	TXL	SAN ANDRES	ECTOR	1952	4380	12,508,307
88071638	8	TXL	SILURIAN	ECTOR	1946	8465	9,307,489
88071696	8	TXL	TUBB	ECTOR	1950	6158	56,553,202
92304500	8	U S M	QUEEN	PECOS	1964	3368	2,219,718
92450001	8	UNION		ANDREWS	1943	7459	16,655,594
92548250	8	UNIVERSITY BLOCK 13	DEVONIAN	ANDREWS	1960	8826	1,478,228
92548500	8	UNIVERSITY BLOCK 13	ELLEN.	ANDREWS	1960	10800	14,978,243
92534250	8	UNIVERSITY BLOCK 9	DEVONIAN	ANDREWS	1954	10450	23,606,166
92534500	8	UNIVERSITY BLOCK 9	PENN.	ANDREWS	1954	8956	15,782,648
92534750	8	UNIVERSITY BLOCK 9	WOLFCAMP	ANDREWS	1953	8430	28,350,317
92618125	8	UNIVERSITY WADDELL	DEVONIAN	CRANE	1949	9040	70,267,302
92618250	8	UNIVERSITY WADDELL	ELLENBURGER	CRANE	1947	10620	9,039,824
93233333	8	VAREL	SAN ANDRES	HOWARD	1955	3080	6,542,943
93308001	8	VEALMOOR		HOWARD	1948	7934	39,565,153
93310001	8	VEALMOOR, EAST		HOWARD	1950	7414	62,692,195
93485300	8	VENTEAM	ELLENBURGER	ECTOR	1995	13250	1,996,282
93852750	8	VINCENT	CLEAR FORK, LOWER	HOWARD	1977	4410	3,111,060
93854500	8	VINCENT, N.	PENNSYLVANIAN REEF	HOWARD	1957	7444	2,558,261
93857500	8	VINCENT, S.	STRAWN	HOWARD	1964	7839	1,195,546
93860500	8	VINCENT, WEST	PENN.	HOWARD	1957	7454	1,116,613
93958100	8	VIREY	CONSOLIDATED	MIDLAND	1995	10844	3,429,592
93958250	8	VIREY	ELLENBURGER	MIDLAND	1954	13276	30,877,195
93958375	8	VIREY	FUSSELMAN	MIDLAND	1955	12234	1,425,380
93958525	8	VIREY	QUEEN	MIDLAND	1988	4299	1,991,053
94439400	8	W. T. FORD	ELLENBURGER	ECTOR	1991	12260	1,072,228
94187200	8	W.A.M., SOUTH	FUSSELMAN	STERLING	1965	8677	2,470,860
94482001	8	WADDELL		CRANE	1927	3500	108,369,174
94640500	8	WAGON WHEEL	PENN	WARD	1979	8812	9,445,581

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
94648166	8	WAHA	DELAWARE	PECOS	1960	4800	1,535,150
94650333	8	WAHA, NORTH	DELAWARE SAND	REEVES	1960	4917	6,771,248
94656086	8	WAHA, W.	CONSOLIDATED DELAWARE	REEVES	1974	6504	2,843,944
94656111	8	WAHA, WEST	DELAWARE	REEVES	1961	5034	2,514,728
94747001	8	WALKER		PECOS	1940	2016	9,482,673
95138406	8	WARD, SOUTH	PENN. DETRI.,UP.	WARD	1963	7700	1,631,943
95138001	8	WARD, SOUTH		WARD	1938	2700	108,366,864
95152475	8	WARD-ESTES, N.	WICHITA - ALBANY	WARD	1995	6581	1,247,410
95152001	8	WARD-ESTES, NORTH		WARD	1929	3000	412,799,795
95108090	8	WAR-SAN	CONSOLIDATED	MIDLAND	1995	10794	3,223,679
95108375	8	WAR-SAN	ELLENBURGER	MIDLAND	1954	13070	14,916,750
95108500	8	WAR-SAN	FUSSELMAN	MIDLAND	1954	12514	2,095,899
95122200	8	WAR-WINK	CHERRY CANYON	WARD	1965	6037	3,251,201
95123875	8	WAR-WINK, E.	7000	WINKLER	1994	7092	1,127,453
95129600	8	WAR-WINK, S.	WOLFCAMP	WARD	1976	12758	12,741,227
95130900	8	WAR-WINK, W.	WOLFCAMP	WARD	1976	11545	2,865,482
95970200	8	WEINER	COLBY SAND	WINKLER	1941	3200	9,239,506
96166333	8	WELLAW	CLEAR FORK, LO.	PECOS	1967	3094	1,181,678
96291333	8	WEMAC	ELLENBURGER	ANDREWS	1954	13306	5,847,947
96291666	8	WEMAC	WOLFCAMP	ANDREWS	1953	8708	4,239,021
96296500	8	WEMAC, SOUTH	WOLFCAMP	ANDREWS	1962	8786	1,701,980
96373400	8	WENTZ	CLEAR FORK	PECOS	1953	2415	5,045,383
96563001	8	WESTBROOK		MITCHELL	1921	3100	106,699,704
96565500	8	WESTBROOK, EAST	CLEAR FORK	MITCHELL	1975	3166	2,233,993
96742300	8	WHEAT	CHERRY CANYON	LOVING	1979	6610	2,118,654
96742001	8	WHEAT		LOVING	1925	4300	22,583,024
96756200	8	WHEELER	DEVONIAN	WINKLER	1945	8590	10,348,368
96756400	8	WHEELER	ELLENBURGER	WINKLER	1942	10697	17,952,199
96756600	8	WHEELER	SILURIAN	WINKLER	1945	9300	2,711,661
96756800	8	WHEELER	WOLFCAMP	ECTOR	1959	7604	5,753,930
96875001	8	WHITE & BAKER		PECOS	1934	1100	5,575,897
97201500	8	WICKETT, SOUTH	YATES	WARD	1952	2640	1,894,254
98817775	8	WORSHAM	DELAWARE SAND	REEVES	1960	4932	1,691,018
99070200	8	WYNNE	CLEAR FORK, UP.	CRANE	1972	3090	1,435,782
99275250	8	YARBROUGH & ALLEN	DEVONIAN	ECTOR	1954	8505	3,569,192
99275375	8	YARBROUGH & ALLEN	ELLENBURGER	ECTOR	1947	10490	40,502,338
99275750	8	YARBROUGH & ALLEN	WADDELL	ECTOR	1950	10110	1,235,313
99295333	8	YATES	SMITH SAND	PECOS	1944	1100	4,356,435
99295001	8	YATES		PECOS	1926	1500	1,381,373,107
99409500	8	YORK	ELLENBURGER	ECTOR	1955	12395	2,636,804
99583600	8	YUCCA BUTTE, W	STRAWN	PECOS	1975	8304	1,889,536
99733500	8	ZEBULON		HOWARD	1988	10324	1,448,904
448200	8A	ACKERLY	DEAN SAND	DAWSON	1954	8172	49,582,865
450375	8A	ACKERLY, NORTH	CISCO	DAWSON	1972	8766	1,106,255
450900	8A	ACKERLY, NORTH	SPRABERRY	DAWSON	1977	7739	2,936,419
450250	8A	ACKERLY, NORTH	CANYON REEF	DAWSON	1958	9154	1,198,872
570500	8A	ADAIR	WOLFCAMP	TERRY	1950	8505	52,422,109
570001	8A	ADAIR		GAINES	1947	4874	66,079,283
573500	8A	ADAIR, NORTHEAST	WOLFCAMP	TERRY	1954	8846	1,326,016
702750	8A	ADCOCK	SPRABERRY	DAWSON	1972	7556	1,268,187
1406001	8A	ALEX		TERRY	1945	5150	1,623,604
1964333	8A	ALSABROOK	DEVONIAN	GAINES	1953	11135	3,815,802
1964666	8A	ALSABROOK	WOLFCAMP	GAINES	1953	9125	1,053,164
2404333	8A	AMROW	DEVONIAN	GAINES	1954	12628	15,980,351
2711001	8A	ANDREW NOODLE CREEK		KENT	1969	4010	1,063,283
3172500	8A	ANTON	CLEAR FORK, LOWER	HOCKLEY	1959	6502	1,045,786
3177500	8A	ANTON, SOUTH	STRAWN	HOCKLEY	1957	9952	1,178,657
3180001	8A	ANTON, WEST		HOCKLEY	1950	6655	2,517,174
3194001	8A	ANTON-IRISH		HALE	1944	5348	200,803,233
3250510	8A	APCLARK	STRAWN	BORDEN	1996	8534	1,231,864
5229500	8A	BALE, EAST	WOLFCAMP	GAINES	1972	10005	1,636,763
8234002	8A	BILLY	ABO	LAMB	1995	6674	1,168,302
8618375	8A	BLACKWATCH	SAN ANDRES	GAINES	1995	4624	1,324,791
8930333	8A	BLOCK A-7	DEVONIAN	GAINES	1959	11100	1,699,349
9060333	8A	BLOCK D	DEVONIAN	YOAKUM	1957	11923	1,931,322
10406500	8A	BONANZA	SAN ANDRES	COCHRAN	1980	4893	2,070,837
10556500	8A	BOOMERANG	PENNSYLVANIAN REEF	KENT	1955	6582	3,293,149
10560500	8A	BOOMERANG, S.	STRAWN LIME	KENT	1964	6623	5,589,563
11308200	8A	BRAHANEY	DEVONIAN	YOAKUM	1979	11372	8,824,267
11308333	8A	BRAHANEY	MISSISSIPPIAN	YOAKUM	1960	10880	4,268,423
11308001	8A	BRAHANEY		YOAKUM	1945	5301	54,223,283
11313300	8A	BRAHANEY, NORTHWEST	DEVONIAN	YOAKUM	1982	11893	14,748,050
11314200	8A	BRAHANEY, W.	DEV	YOAKUM	1981	11645	1,447,939
11334300	8A	BRALLEY	SILURIAN	YOAKUM	1991	13108	1,927,011
12060500	8A	BRITT	SPRABERRY	DAWSON	1957	7396	1,095,217
12118500	8A	BROADVIEW, WEST	CLEAR FORK	LUBBOCK	1960	5565	3,389,002
12160600	8A	BRONCO	SILURO-DEVONIAN	YOAKUM	1952	11692	14,292,254
12376666	8A	BROWN	WICHITA - ALBANY	GAINES	1960	8004	4,550,006
12376001	8A	BROWN		GAINES	1948	6030	5,380,103
12476400	8A	BROWNFIELD, S.	STRAWN	TERRY	1981	10613	1,349,752
12469333	8A	BROWNFIELD, SOUTH	CANYON	TERRY	1950	9330	5,252,940
12469666	8A	BROWNFIELD, SOUTH	FUSSELMAN	TERRY	1968	12020	5,524,831
12961500	8A	BUCKSHOT	4950	COCHRAN	1956	5010	11,816,602

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
13047001	8A	BUENOS		GARZA	1949	3397	1,834,059
14627333	8A	CAIN	SPRABERRY	GARZA	1959	4916	1,370,936
14627666	8A	CAIN	STRAWN	GARZA	1959	7652	1,047,176
15724500	8A	CARM-ANN	SAN ANDRES	GAINES	1979	4779	1,307,285
16580001	8A	CEDAR LAKE		GAINES	1939	4800	105,374,960
16585500	8A	CEDAR LAKE, SE.	SAN ANDRES	DAWSON	1953	4940	1,649,672
16860333	8A	CHAMPMON	DEV.	GAINES	1959	12735	1,334,656
18436333	8A	CLAIREMONT	PENN., LOWER	KENT	1950	6742	15,880,427
18437333	8A	CLAIREMONT, EAST	STRAWN	KENT	1960	6494	1,456,046
18535500	8A	CLARA GOOD	FUSSELMAN	BORDEN	1956	9740	1,158,807
18790700	8A	CLAYTON RANCH, N.	SPRABERRY	BORDEN	1985	5738	2,273,366
19346142	8A	COGDELL	AREA	KENT	1949	6796	264,228,838
19346284	8A	COGDELL	FULLER SAND	KENT	1950	4985	1,234,509
19346426	8A	COGDELL	SAN ANDRES	KENT	1951	1475	1,455,502
19347250	8A	COGDELL, EAST	CANYON	SCURRY	1958	6813	5,745,654
19351333	8A	COGDELL, SE.	CANYON 6800	SCURRY	1970	6832	1,935,449
20553500	8A	CORAZON	SAN ANDRES	SCURRY	1953	2139	5,457,029
20787001	8A	CORRIGAN		TERRY	1950	11475	4,235,262
20788500	8A	CORRIGAN, EAST	FUSSELMAN	TERRY	1952	11615	4,669,363
21090500	8A	COULTER	SPRABERRY	GARZA	1979	5296	1,184,144
21959500	8A	CROTON CREEK, E.	TANNEHILL	DICKENS	1969	4574	1,285,205
22576333	8A	D. E. B.	WOLFCAMP	GAINES	1960	9200	22,699,269
22576666	8A	D. E. B.	WOLFCAMP, ZONE B	GAINES	1960	9400	1,468,007
24377300	8A	DEROEN	MISSISSIPPIAN	DAWSON	1981	10182	2,002,217
24562142	8A	DIAMOND -M-	CANYON LIME AREA	SCURRY	1948	6569	248,878,432
24562284	8A	DIAMOND -M-	CLEAR FORK	SCURRY	1940	3170	9,832,055
24562710	8A	DIAMOND -M-	WOLFCAMP	SCURRY	1952	5310	2,596,809
22660500	8A	D-L-S	SAN ANDRES	HOCKLEY	1971	5161	13,371,869
25243500	8A	DOMINION	SILURIAN	TERRY	1979	13342	1,005,286
25544001	8A	DORWARD		GARZA	1950	2456	26,776,688
25585500	8A	DOSS	CANYON	GAINES	1949	8850	1,712,794
25728500	8A	DOUBLE J	CANYON REEF	BORDEN	1969	6641	4,335,241
25957600	8A	DOVER	STRAWN	GARZA	1985	8123	1,268,004
26606333	8A	DUNIGAN	ELLENBURGER	BORDEN	1958	8737	1,136,041
26706333	8A	DUPREE	FUSSELMAN	DAWSON	1960	11670	1,608,926
27451500	8A	ECHOLS	SPRABERRY	DAWSON	1984	8277	1,375,136
27664500	8A	EDMISSON	CLEAR FORK	LUBBOCK	1957	5143	14,122,508
27668500	8A	EDMISSON, N.W.	CLEAR FORK	LUBBOCK	1979	5446	2,958,886
28829500	8A	ELZON, W.	STRAWN 6950	KENT	1967	6972	1,674,677
28873500	8A	EMERALD	SILURIAN	YOAKUM	1988	12372	1,550,264
30559166	8A	FELKEN	SPRABERRY	DAWSON	1955	7490	5,863,624
30776500	8A	FIELDS	DEVONIAN	YOAKUM	1954	12030	4,042,266
31222300	8A	FLANAGAN	CLEARFORK, CONS.	GAINES	1949	7142	34,993,943
31222600	8A	FLANAGAN	DEVONIAN	GAINES	1949	10345	2,600,285
31690250	8A	FLUVANNA	ELLENBURGER	BORDEN	1952	8358	3,079,237
31690750	8A	FLUVANNA	STRAWN	BORDEN	1954	7769	13,893,241
31690001	8A	FLUVANNA		BORDEN	1951	8173	5,788,200
31697166	8A	FLUVANNA, SW.	ELLEN.	BORDEN	1968	8306	1,559,708
31697847	8A	FLUVANNA, SW.	STRAWN, UPPER	BORDEN	1973	7902	3,048,201
31893333	8A	FORBES	GLORIETA	CROSBY	1955	3605	8,897,397
33190001	8A	FULLER		SCURRY	1951	5147	7,431,645
33191250	8A	FULLER, EAST	CANYON	SCURRY	1961	6846	2,016,286
33191500	8A	FULLER, EAST	FULLER -B-	SCURRY	1961	4935	1,251,629
33196332	8A	FULLER, SE.	FULLER	SCURRY	1957	5032	1,233,168
33196498	8A	FULLER, SE.	FULLER -C-	SCURRY	1961	5029	1,356,946
34113125	8A	GARZA	GLORIETA	GARZA	1956	3758	1,449,452
34113160	8A	GARZA	GLORIETA, S. DEEP	GARZA	1985	3692	4,388,968
34113001	8A	GARZA		GARZA	1926	2900	116,170,788
34113425	8A	GARZA	SAN ANDRES, DEEP	GARZA	1985	3465	9,648,491
34438500	8A	GEORGE ALLEN	SAN ANDRES	GAINES	1956	4934	1,255,323
34742450	8A	GIEBEL	CFA	GAINES	1998	7670	1,355,740
34849500	8A	GILL	PENN. REEF 6900	SCURRY	1970	6937	1,155,277
34961250	8A	GIN	MISS.	DAWSON	1965	11403	1,148,179
34961750	8A	GIN	SPRABERRY	DAWSON	1965	8068	6,412,068
34970500	8A	GIN, NORTH	8000	DAWSON	1975	8029	3,602,421
33473250	8A	G-M-K	SAN ANDRES	GAINES	1957	5598	15,599,746
33477500	8A	G-M-K, SOUTH	SAN ANDRES	GAINES	1963	5450	16,777,664
35738001	8A	GOOD		BORDEN	1949	7905	49,768,450
35741500	8A	GOOD, NORTHEAST	CANYON REEF	BORDEN	1953	8066	3,509,246
35744666	8A	GOOD, SE.	FUSSELMAN	BORDEN	1958	9692	10,453,193
35744333	8A	GOOD, SE.	CANYON REEF	BORDEN	1959	8123	1,095,717
37356666	8A	GUINN	SAN ANDRES	LYNN	1961	4031	1,875,859
37695500	8A	H & L	GLORIETA	GARZA	1967	3397	2,838,452
38455500	8A	HAMILTON	CLEARFORK	HOCKLEY	1980	6459	1,207,473
38686500	8A	HANFORD	SAN ANDRES	GAINES	1977	5421	11,999,935
38832333	8A	HAP	DEVONIAN	GAINES	1955	12356	1,588,017
38866333	8A	HAPPY	ELLENBURGER	GARZA	1958	8281	3,075,019
38866666	8A	HAPPY	STRAWN	GARZA	1958	7951	1,839,792
38866600	8A	HAPPY	SPRABERRY LIME	GARZA	1989	4970	7,336,714
39242333	8A	HARRIS	QUEEN	GAINES	1957	4148	1,672,816
39242001	8A	HARRIS		GAINES	1949	5965	77,544,178
39717500	8A	HAVEMEYER	SAN ANDRES	GAINES	1977	5488	1,175,130
40716333	8A	HERMLEIGH	STRAWN	SCURRY	1953	6530	1,051,427

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
41769001	8A	HOBBS, EAST		GAINES	1949	6390	1,623,627
41816333	8A	HOBO	PENNSYLVANIAN	BORDEN	1951	7100	12,964,339
42401400	8A	HOMANN	SAN ANDRES	GAINES	1977	5328	2,058,353
42499500	8A	HOOPLE	CLEAR FORK	LUBBOCK	1976	4432	14,531,548
43083250	8A	HUAT	CANYON	GAINES	1961	10470	6,037,105
43731666	8A	HUNTLEY	3400	GARZA	1954	3387	16,691,235
43731333	8A	HUNTLEY	GLORIETA	GARZA	1954	3966	7,649,424
43732500	8A	HUNTLEY, EAST	SAN ANDRES	GARZA	1956	3138	8,883,820
44238500	8A	IDALOU	STRAWN	LUBBOCK	1970	9264	2,063,298
44245500	8A	IDALOU, NORTH	CLEARFORK, LO	LUBBOCK	1979	5650	2,252,994
44313666	8A	ILLUSION LAKE	SAN ANDRES	LAMB	1957	4116	2,274,312
45726550	8A	JANICE	WOLFCAMP	YOAKUM	1981	8937	1,577,530
45991666	8A	JAYTON, WEST	STRAWN SAND	KENT	1963	6466	1,938,821
46132500	8A	JENKINS	SAN ANDRES	GAINES	1950	4543	3,162,188
46132001	8A	JENKINS		GAINES	1948	9100	1,441,170
46134250	8A	JENKINS, NORTH	CANYON	GAINES	1952	8590	1,079,745
46134500	8A	JENKINS, NORTH	CLEAR FORK	GAINES	1954	7148	2,690,500
46564750	8A	JO-MILL	SPRABERRY	BORDEN	1954	7105	108,593,322
47187001	8A	JONES RANCH		GAINES	1945	11200	7,849,382
48338500	8A	KAY	WOLFCAMP REEF	GAINES	1959	10349	1,976,465
48583664	8A	KELLY SNYDER	CLEAR FORK, LOWER	SCURRY	1956	3320	1,227,148
48583498	8A	KELLY-SNYDER	CISCO SAND	SCURRY	1952	6180	15,359,584
48583001	8A	KELLY-SNYDER		SCURRY	1948	6795	1,264,215,085
49113750	8A	KEY	SPRABERRY, UPPER	DAWSON	1963	6978	1,040,170
49125500	8A	KEY WEST	SPRABERRY	DAWSON	1982	7680	1,404,146
49460500	8A	KINGDOM	ABO REEF	TERRY	1970	8120	57,666,707
49678500	8A	KIRKPATRICK	PENN.	GARZA	1961	7902	1,534,724
51742333	8A	LAMESA, WEST	MISS.	DAWSON	1959	11280	1,903,803
51742666	8A	LAMESA, WEST	SPRABERRY	DAWSON	1960	7999	2,640,850
51812500	8A	LANDON	DEVONIAN	COCHRAN	1949	10913	1,676,236
51812750	8A	LANDON	STRAWN	COCHRAN	1947	10340	1,210,407
51812001	8A	LANDON		YOAKUM	1945	5100	7,100,093
52872001	8A	LEE HARRISON		LUBBOCK	1941	4870	15,622,248
52916500	8A	LEEPER	GLORIETA	TERRY	1958	5896	14,672,329
53411070	8A	LEVELLAND	ABO	HOCKLEY	1976	7566	1,521,730
53411710	8A	LEVELLAND	STRAWN	HOCKLEY	1957	10120	1,044,056
53411001	8A	LEVELLAND		COCHRAN	1945	4927	642,609,421
53411852	8A	LEVELLAND	WICHITA-ALBANY	HOCKLEY	1965	7488	1,039,496
53414500	8A	LEVELLAND, NE.	STRAWN	HOCKLEY	1964	10084	3,448,189
53759333	8A	LINKER	CLEAR FORK	HOCKLEY	1961	7162	1,953,860
54098500	8A	LITTLEFIELD	SAN ANDRES	LAMB	1953	4030	4,806,609
55578500	8A	LUCY, NORTH	PENN	BORDEN	1973	7830	2,259,712
55975500	8A	LYN KAY	6150	KENT	1975	6164	1,157,730
56382200	8A	MABEN	CISCO	KENT	1989	5664	1,481,691
58027500	8A	MARY TWO	DEVONIAN	YOAKUM	1981	13220	1,388,687
60989200	8A	MICHELLE KAY	CISCO	KENT	1983	5835	2,252,054
62079500	8A	MIRIAM	GLORIETA 4740	LYNN	1966	4867	1,145,553
63289500	8A	MOUND LAKE	FUSSELMAN	TERRY	1962	11320	2,532,705
56432700	8A	MTS	SAN ANDRES	DAWSON	1984	4922	3,011,168
63799500	8A	MUNGERVILLE	PENNSYLVANIAN	DAWSON	1951	8570	9,030,669
64217500	8A	MYRTLE, NW.	STRAWN	BORDEN	1967	8030	1,013,491
64221666	8A	MYRTLE, W.	STRAWN	BORDEN	1956	8072	2,662,450
64626380	8A	NAVIGATOR	TANNEHILL B	DICKENS	1996	4418	1,273,061
66373250	8A	O D C	DEVONIAN	GAINES	1956	11993	2,812,852
66373750	8A	O D C	SAN ANDRES	GAINES	1956	5450	4,775,959
67899400	8A	OWNBY	CLEAR FORK, UPPER	YOAKUM	1959	6592	22,886,861
67899001	8A	OWNBY		YOAKUM	1941	5350	19,365,908
67905500	8A	OWNBY, WEST	SAN ANDRES	YOAKUM	1953	5307	1,518,031
68101500	8A	P. H. D.	GLORIETA	GARZA	1955	4296	2,535,850
68101001	8A	P. H. D.		GARZA	1944	3565	10,800,728
69563250	8A	PATRICIA	FUSSELMAN	DAWSON	1959	12020	3,983,286
69570500	8A	PATRICIA, WEST	SPRABERRY	DAWSON	1962	8370	1,228,314
71260500	8A	PHIL WRIGHT	SPRABERRY	DAWSON	1982	7832	3,699,781
72213500	8A	POLAR, EAST	PENNSYLVANIAN	KENT	1950	6855	1,993,424
72214500	8A	POLAR, NORTH	ELLENBURGER	KENT	1950	7780	1,439,914
72225500	8A	POLLAN	ELLENBURGER	GARZA	1978	7733	2,931,773
72552500	8A	POST	GLORIETA	GARZA	1950	2700	15,161,894
72560500	8A	POST, WEST	STRAWN	GARZA	1979	8482	1,099,724
72995470	8A	PRENTICE	5100	YOAKUM	1974	5240	1,877,441
72995498	8A	PRENTICE	6700	YOAKUM	1950	6700	150,194,889
72995166	8A	PRENTICE	CLEAR FORK, LOWER	YOAKUM	1955	8130	3,778,472
72995001	8A	PRENTICE		YOAKUM	1951	5940	48,873,597
72999500	8A	PRENTICE, NW.	SAN ANDRES	YOAKUM	1969	5164	3,740,591
74590075	8A	RAND-PAULSON	CANYON	HOCKLEY	1995	9638	1,123,263
75552500	8A	REEVES	SAN ANDRES	YOAKUM	1957	5544	33,359,158
75780001	8A	REINECKE		BORDEN	1950	6791	85,247,005
75781500	8A	REINECKE, E.	CANYON	BORDEN	1966	6794	1,281,886
76043500	8A	REO	JO MILL, LOWER	BORDEN	1980	7350	3,638,537
76093666	8A	REVILO	GLORIETA	SCURRY	1955	2624	13,908,430
76707001	8A	RILEY, NORTH		GAINES	1947	6930	44,651,363
77316852	8A	ROBERTSON	SAN ANDRES	GAINES	1952	4700	2,221,921
77318666	8A	ROBERTSON, N.	CLEAR FORK 7100	GAINES	1956	7114	176,656,655
77318900	8A	ROBERTSON, N.	SAN ANDRES	GAINES	1976	4704	5,011,781

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
77643333	8A	ROCKER -A-	CLEAR FORK	GARZA	1958	3236	1,269,266
77643666	8A	ROCKER -A-	GLORIETA	GARZA	1955	3082	4,308,818
77643001	8A	ROCKER -A-		GARZA	1950	2422	7,180,789
77647333	8A	ROCKER -A-, NW.	SAN ANDRES	GARZA	1959	2772	2,248,354
78167001	8A	ROPES		HOCKLEY	1950	9290	25,593,426
78168500	8A	ROPES, E.	CLEAR FORK	HOCKLEY	1964	6036	3,017,622
78175333	8A	ROPES, WEST	CISCO SAND	HOCKLEY	1953	9875	7,217,081
78525500	8A	ROUGH DRAW, N.	NOODLE CREEK	KENT	1963	4140	1,620,751
79002166	8A	RUSSELL	CLEARFORK 7000	GAINES	1943	7300	63,297,892
79002332	8A	RUSSELL	GLORIETA 6100	GAINES	1942	6100	9,018,065
79004750	8A	RUSSELL, NORTH	6600	GAINES	1957	6736	2,412,699
79004250	8A	RUSSELL, NORTH	DEVONIAN	GAINES	1948	11125	79,739,814
79007500	8A	RUSSELL, S.	SAN ANDRES	GAINES	1964	4859	2,395,124
79393750	8A	SABLE	SAN ANDRES	YOAKUM	1957	5258	10,835,456
79887001	8A	SALT CREEK		KENT	1950	6200	356,369,037
79891500	8A	SALT CREEK, SOUTH	PENN., LOWER	KENT	1952	6622	1,403,717
81913500	8A	SEAGRAVES	SILURO - DEVONIAN	GAINES	1955	13028	4,944,608
81913750	8A	SEAGRAVES	STRAWN	GAINES	1956	11243	1,049,161
81917666	8A	SEAGRAVES, S.	SILURO - DEVONIAN	GAINES	1955	12997	1,783,158
81987400	8A	SEAN ANDREW	PENN.	DAWSON	1994	8329	1,296,502
82225040	8A	SEMINOLE	DEVONIAN	GAINES	1977	11500	5,811,135
82225142	8A	SEMINOLE	SAN ANDRES	GAINES	1936	5032	602,619,981
82225284	8A	SEMINOLE	SAN ANGELO	GAINES	1947	6536	8,777,639
82225568	8A	SEMINOLE	WOLFCAMP LIME	GAINES	1963	9259	1,455,586
82225710	8A	SEMINOLE	WOLFCAMP REEF	GAINES	1962	9162	1,452,509
82226500	8A	SEMINOLE, EAST	SAN ANDRES	GAINES	1959	5450	10,892,763
82228800	8A	SEMINOLE, NE.	SAN ANDRES	GAINES	1986	5427	1,897,871
82229750	8A	SEMINOLE, NW.	DEVONIAN FB 2	GAINES	1964	11456	1,508,906
82231500	8A	SEMINOLE, SE.	SAN ANDRES	GAINES	1964	5310	3,007,614
82231540	8A	SEMINOLE, SE.	STRAWN	GAINES	1973	10792	2,249,644
82233200	8A	SEMINOLE, W.	DEVONIAN	GAINES	1956	11136	1,271,248
82233400	8A	SEMINOLE, W.	DEVONIAN FB 2	GAINES	1957	10554	1,783,937
82233600	8A	SEMINOLE, W.	LEONARD	GAINES	1956	8742	1,473,334
82233001	8A	SEMINOLE, WEST		GAINES	1948	5042	47,466,149
82710498	8A	SHARON RIDGE	1700	SCURRY	1923	1759	66,480,174
82710166	8A	SHARON RIDGE	CLEAR FORK	SCURRY	1950	2994	40,352,615
83991400	8A	SLAUGHTER	CLEAR FORK 7190	HOCKLEY	1966	7332	2,696,681
83991001	8A	SLAUGHTER		COCHRAN	1937	5000	1,207,424,888
84258500	8A	SMITH	SPRABERRY	DAWSON	1950	7940	1,541,626
79303666	8A	S-M-S	CANYON SAND	KENT	1954	6100	11,405,716
84345001	8A	SMYER		HOCKLEY	1944	5980	48,419,531
84347666	8A	SMYER, N.	STRAWN	HOCKLEY	1956	9968	6,354,886
84347333	8A	SMYER, NORTH	CANYON	HOCKLEY	1956	9630	5,195,857
84470750	8A	SNYDER, N	STRAWN ZONE B	SCURRY	1950	7300	7,936,335
85281001	8A	SPRABERRY	PERMIAN	DAWSON	1946	3930	2,381,850
85282001	8A	SPRABERRY, DEEP		DAWSON	1949	6420	11,213,033
85282500	8A	SPRABERRY, DEEP	SPRABERRY, LO.	DAWSON	1957	7592	13,701,528
85292450	8A	SPRABERRY, W.	DEEP, SPRABERRY	DAWSON	1988	7018	13,023,206
85292750	8A	SPRABERRY, WEST	PENN.	DAWSON	1953	8060	2,293,014
85743666	8A	STATEX	CISCO REEF	TERRY	1952	10032	2,870,697
86175500	8A	STINNETT, SE.	CLEAR FORK	LUBBOCK	1963	4585	2,749,554
86252400	8A	STOCKYARD	CLEARFORK, UPPER	GAINES	1991	6480	1,976,951
87157200	8A	SUNDOWN	ABO	HOCKLEY	1978	7926	1,056,569
87173100	8A	SUNILAND		LYNN	1978	3803	9,769,796
87640500	8A	SWENSON-BARRON	ELLEN.	GARZA	1977	8000	13,153,109
87646500	8A	SWENSON-GARZA	STRAWN	GARZA	1971	7356	1,390,411
88611568	8A	TEAS	PENN. 8100	GARZA	1958	8069	3,892,415
88611142	8A	TEAS	ELLENBURGER	GARZA	1958	8396	1,100,062
88760100	8A	TEN GALLON	CANYON LIME	SCURRY	1992	6760	1,173,235
88969800	8A	TEX-FLOR	WOLFCAMP	GAINES	1977	9152	1,810,349
88977142	8A	TEX-HAMON	CANYON	DAWSON	1962	10060	1,399,045
88977284	8A	TEX-HAMON	DEAN	DAWSON	1967	9555	6,356,866
88977426	8A	TEX-HAMON	FUSSELMAN	DAWSON	1962	11574	16,869,275
88977710	8A	TEX-HAMON	MONTOYA	DAWSON	1962	11675	4,833,739
89010700	8A	TEX-MEX, SE.	WICHITA ALBANY	GAINES	1983	7498	5,335,900
89024333	8A	TEX-PAC	CLEAR FORK	GAINES	1956	8290	1,886,905
89038500	8A	TEX-SIN	DEVONIAN	GAINES	1962	12285	7,998,812
89732500	8A	THREE WAY	SAN ANDRES	GARZA	1958	3493	2,192,455
89715400	8A	THREE-O-THREE	SAN ANDRES	GAINES	1991	5538	1,244,903
88000500	8A	TLOC	SAN ANDRES	TERRY	1980	4904	1,457,257
90268333	8A	TOBE	STRAWN	GARZA	1951	7451	1,733,188
90365300	8A	TOKIO	FUSSELMAN	TERRY	1979	12871	1,415,477
90369666	8A	TOKIO, SOUTH	WOLFCAMP	TERRY	1953	9860	3,114,383
90694125	8A	TONTO	CANYON SAND	SCURRY	1955	6690	3,093,714
90697500	8A	TONTO, NE.	CISCO 5030	SCURRY	1966	5046	1,700,852
91318500	8A	TRIPLE D	PENN. REEF	DAWSON	1958	8497	1,088,474
91406500	8A	TRIPP	DEVONIAN	GAINES	1964	12577	1,657,515
91115500	8A	TRI-RUE	REEF	SCURRY	1956	6862	6,516,418
91621001	8A	TSTAR	ABO	HOCKLEY	1996	8039	3,223,835
91670700	8A	TUFBOW	STRAWN	GARZA	1979	7599	1,300,773
91784700	8A	TUMBLEWEED, NW.	TANNEHILL	DICKENS	1986	4108	2,021,841
92290333	8A	U-LAZY -S-	ELLENBURGER	BORDEN	1957	8633	2,338,392
92290666	8A	U-LAZY -S-	PENNSYLVANIAN	BORDEN	1958	8084	3,015,323

RRC_RESN	RRC	FLDNAME	RESNAME	COUNTY	DISCYR	DEPTHTOP	CUMPROD
93234500	8A	VAREL	GLORIETA	SCURRY	1955	2680	1,559,599
94114001	8A	VON ROEDER		BORDEN	1959	6835	19,299,794
94114666	8A	VON ROEDER	WOLFCAMP	BORDEN	1964	6063	1,020,734
94116001	8A	VON ROEDER, NORTH		BORDEN	1954	6835	10,322,342
94748666	8A	WALKER	DEVONIAN	COCHRAN	1967	11818	1,692,316
95245500	8A	WARHORSE	CLEARFORK, UP.	TERRY	1975	6801	3,346,790
95397600	8A	WASSON	WICHITA ALBANY	GAINES	1960	11038	11,639,560
95397800	8A	WASSON	WOLFCAMP	GAINES	1956	8448	6,060,592
95397001	8A	WASSON		YOAKUM	1937	4900	1,840,501,580
95431001	8A	WASSON 72		YOAKUM	1940	7200	109,696,671
95400333	8A	WASSON, NE.	CLEAR FORK	YOAKUM	1954	7800	20,763,808
95402333	8A	WASSON, S.	WICHITA - ALBANY	GAINES	1962	7711	4,652,147
94215500	8A	WBD	SAN ANDRES	YOAKUM	1969	5288	1,056,403
96062001	8A	WELCH		DAWSON	1941	5000	168,998,863
96068666	8A	WELCH, SE.	SPRABERRY	DAWSON	1952	7690	7,826,429
96180001	8A	WELLMAN		TERRY	1950	9712	74,181,795
96187333	8A	WELLMAN, SW.	SAN ANDRES	TERRY	1966	5509	2,982,644
96188333	8A	WELLMAN, W.	SAN ANDRES	TERRY	1966	5583	2,607,101
96202500	8A	WELLS	DEVONIAN	DAWSON	1955	12083	8,760,790
96408166	8A	WESCOTT	DEV.	GAINES	1964	12360	3,933,775
96408664	8A	WESCOTT	STRAWN	GAINES	1954	11008	5,564,505
96487500	8A	WEST	DEVONIAN	YOAKUM	1957	11058	23,898,463
96487001	8A	WEST		YOAKUM	1938	5100	2,668,047
97057500	8A	WHITHARRAL	CLEAR FORK, LO.	HOCKLEY	1971	6938	3,909,654
94432500	8A	WTG	GLORIETA	GARZA	1979	3232	2,712,643
99343001	8A	YELLOWHOUSE		HOCKLEY	1944	4463	15,574,053
99347500	8A	YELLOWHOUSE, S.	SAN ANDRES	HOCKLEY	1957	4705	2,457,147

Appendix B. Oil reservoirs in the New Mexico part of the Permian Basin having a cumulative production of >1 MMbbl. Reservoirs are in alphabetical order within counties.

FIELD NAME	RESERVOIR UNIT	COUNTY	DISCYR	DEPTHTOP	CUMPROD
Cato (San Andres)	San Andres	Chaves	1966	3414	16,254,326
Caprock (Queen)	Queen	Chaves & Lea	1950	3030	74,210,930
Chaveroo (San Andres)	San Andres	Chaves & Roosevelt	1965	4184	24,500,761
Chisum (Devonian)	Fusselman	Chaves	1950	6490	1,222,275
Diablo (San Andres)	San Andres	Chaves	1963	4950	1,332,827
Double L (Queen)	Queen	Chaves	1971	1980	3,511,218
Little Lucky Lake (Devonian)	Silurian	Chaves	1958	11050	1,826,075
Sulimar (Queen)	Queen	Chaves	1968	1960	2,334,105
Tobac (Pennsylvanian)	Upper Pennsylvanian	Chaves	1964	9058	9,227,853
Tom Tom (San Andres)	San Andres	Chaves	1967	3914	3,539,296
Tomahawk (San Andres)	San Andres	Chaves & Roosevelt	1977	4144	2,339,193
Twin Lakes (San Andres)	San Andres	Chaves	1965	2600	5,306,383
Artesia (Queen Grayburg San Andres)	Queen Grayburg San Andres	Eddy	1923	1884	32,271,228
Atoka (Glorieta Yeso)	Glorieta Yeso	Eddy	1983	2660	4,031,176
Atoka (San Andres)	San Andres	Eddy	1950	1680	6,999,883
Avalon (Delaware)	Delaware	Eddy	1980	2550	4,952,379
Barber (Yates)	Yates	Eddy	1937	1442	1,973,771
Benson North (Queen Grayburg)	Queen Grayburg	Eddy	1954	2844	3,468,936
Big Eddy (Strawn)	Strawn	Eddy	1966	11333	1,402,000
Brushy Draw (Delaware)	Delaware	Eddy	1958	3200	6,967,405
Burton Flat East (Strawn)	Strawn	Eddy	1976	10600	2,990,681
Burton Flat North (Wolfcamp)	Wolfcamp	Eddy	1975	9160	3,226,531
Cabin Lake (Delaware)	Delaware	Eddy	1987	5625	3,798,138
Catclaw Draw East (Delaware)	Delaware	Eddy	1990	3074	1,219,588
Cedar Canyon (Delaware)	Delaware	Eddy	1976	5200	1,010,544
Dagger Draw North (Upper Penn)	Upper Pennsylvanian	Eddy	1974	7550	48,909,673
Dagger Draw South (Upper Penn)	Upper Pennsylvanian	Eddy	1971	7506	16,214,241
Dos Hermanos (Yates Seven Rivers)	Yates Seven Rivers	Eddy	1955	1631	1,605,623
Eagle Creek (San Andres)	San Andres	Eddy	1959	1292	4,321,284
Empire (Abo)	Abo	Eddy	1957	6014	225,140,765
Empire (Yates Seven Rivers)	Yates Seven Rivers	Eddy	1926	1600	1,291,409
Esperanza (Delaware)	Delaware	Eddy	1969	3400	1,272,693
Fren (Seven Rivers)	Seven Rivers	Eddy	1943	1940	6,680,361
Getty (Yates)	Yates	Eddy	1954	1343	1,822,000
Golden Lane (Strawn)	Strawn	Eddy	1969	11098	1,448,602
Grayburg Jackson (Seven Rivers Queen Grayburg San Andres)	Seven Rivers Queen Grayburg San Andres	Eddy & Lea	1929	3100	128,043,260
Hackberry North (Yates Seven Rivers)	Yates Seven Rivers	Eddy	1953	2047	3,468,223
Henshaw (Wolfcamp)	Wolfcamp	Eddy	1960	8822	3,401,748
Henshaw West (Grayburg)	Grayburg	Eddy	1956	2745	5,024,733
Herradura Bend (Delaware)	Delaware	Eddy	1977	11086	1,012,833
Herradura Bend East (Delaware)	Delaware	Eddy	1985	6062	1,555,292
High Lonesome (Queen)	Queen	Eddy	1939	1800	4,609,851
Humble City (Strawn)	Strawn	Eddy	1972	11429	1,303,341
Indian Basin (Upper Pennsylvanian)	Upper Pennsylvanian	Eddy	1963	7370	8,971,697
Indian Basin (Upper Pennsylvanian)	Upper Pennsylvanian	Eddy	1993	7400	4,302,744
Indian Draw (Delaware)	Delaware	Eddy	1973	3262	3,316,622
Ingle Wells (Delaware)	Delaware	Eddy	1989	8100	7,458,269
Jackson (Abo)	Abo	Eddy	1961	6910	1,053,208
Livingston Ridge (Delaware)	Delaware	Eddy	1989	7091	5,155,100
Loco Hills (Queen Grayburg San Andres)	Queen Grayburg San Andres	Eddy	1949	2200	48,282,690
Los Medanos (Delaware)	Delaware	Eddy	1990	4218	2,894,378
Lost Tank (Delaware)	Delaware	Eddy & Lea	1991	6783	2,688,111
Loving (Brushy Canyon)	Brushy Canyon	Eddy	1993	6050	4,945,114
Malaga (Delaware)	Delaware	Eddy	1951	2770	1,006,678
Maljamar (Grayburg San Andres)	Grayburg San Andres	Eddy & Lea	1939	3690	158,141,214
Maljamar (Paddock)	Paddock	Eddy	1951	2770	1,299,622
Mason North (Delaware)	Delaware	Eddy & Lea	1954	4115	4,737,873
Millman East (Grayburg)	Grayburg	Eddy	1959	2413	7,402,866
Millman East (Queen Grayburg San Andres)	Queen Grayburg San Andres	Eddy	1959	2413	7,402,866
Nash Draw (Brushy Canyon)	Brushy Canyon	Eddy	1992	6713	1,495,514
Old Millman Ranch (Bone Spring)	Bone Spring	Eddy	1991	6140	1,211,918
Parkway (Delaware)	Delaware	Eddy	1988	4135	3,307,433
Penasco Draw (San Andres Yeso)	San Andres Yeso	Eddy	1982	2250	2,284,403
Red Lake (Queen Grayburg San Andres)	Queen Grayburg San Andres	Eddy	1934	1945	12,719,172
Red Lake East (Queen Grayburg)	Queen Grayburg	Eddy	1960	1560	1,439,093
Sand Dunes (Cherry Canyon)	Cherry Canyon	Eddy	1970	6020	1,076,059
Sand Dunes West (Delaware)	Delaware	Eddy	1992	7820	5,938,672
Shugart (Delaware)	Delaware	Eddy	1958	4970	1,640,470
Shugart (Siluro-Devonian)	Devonian	Eddy	1957	12362	1,114,333
Shugart (Yates Seven Rivers Queen Grayburg)	Yates Seven Rivers Queen Grayburg	Eddy	1937	3440	28,507,187
Shugart North (Bone Spring)	Bone Spring	Eddy	1986	7680	8,808,302
Square Lake (Grayburg San Andres)	Grayburg	Eddy	1941	2900	28,338,035
Square Lake North (Queen Grayburg San Andres)	Queen Grayburg San Andres	Eddy	1987	3300	2,690,235
Tamano (Bone Spring)	Bone Spring	Eddy	1985	8100	2,733,675
Travis (Upper Pennsylvanian)	Upper Pennsylvanian	Eddy	1977	9825	1,986,681

FIELD NAME	RESERVOIR UNIT	COUNTY	DISCYR	DEPTHTOP	CUMPROD
Turkey Track (Seven Rivers Queen Grayburg San Andres)	Seven Rivers Queen Grayburg San Andres	Eddy	1950	1655	3,885,863
Airstrip (Bone Spring)	Bone Spring	Lea	1979	9329	2,427,057
Airstrip North (Bone Spring)	Bone Spring	Lea	1986	9600	1,322,012
Allison (Pennsylvanian)	Upper Pennsylvanian	Lea	1954	9673	23,833,082
Anderson Ranch (Devonian)	Silurian	Lea	1953	13374	8,732,227
Anderson Ranch (Wolfcamp)	Wolfcamp	Lea	1953	13374	4,235,028
Anderson Ranch North (Cisco Canyon)	Upper Pennsylvanian	Lea	1984	11498	1,321,870
Anderson Ranch North (Wolfcamp)	Wolfcamp	Lea	1960	9823	6,652,176
Antelope Ridge (Atoka)	Atoka	Lea	1965	12240	2,239,920
Arrowhead (Grayburg)	Grayburg	Lea	1957	6500	32,921,348
Bagley (Pennsylvanian)	Upper Pennsylvanian	Lea	1949	9190	4,339,919
Bagley (Siluro-Devonian)	Silurian	Lea	1949	10950	28,461,902
Bagley North (Permo Penn)	Permo-Pennsylvanian	Lea	1957	10000	52,951,956
Baish (Wolfcamp)	Wolfcamp	Lea	1962	9800	1,068,654
Bar-U (Pennsylvanian)	Upper Pennsylvanian	Lea	1964	9100	1,364,117
Baum (Upper Pennsylvanian)	Upper Pennsylvanian	Lea	1955	9940	15,224,467
Blinebry O & G (Blinebry)	Blinebry	Lea	1945	5600	41,171,199
Bough (Devonian)	Silurian	Lea	1965	11920	3,798,039
Bough (Permo Penn)	Permo-Pennsylvanian	Lea	1949	9617	6,329,000
Bowers (Seven Rivers)	Seven Rivers	Lea	1935	3553	4,234,123
Bronco (Siluro-Devonian)	Siluro-Devonian	Lea	1955	11700	16,048,762
Bronco (Wolfcamp)	Wolfcamp	Lea	1953	11700	2,086,478
Bronco West (Devonian)	Devonian	Lea	1965	12170	1,420,225
Brunson (Ellenburger)	Ellenburger	Lea	1945	8059	27,654,212
Brunson (Fusselman)	Silurian	Lea	1980	7200	1,162,659
Brunson South (Abo Drinkard)	Abo Drinkard	Lea	1988	6750	10,117,489
Buckeye (Abo)	Abo	Lea	1965	8950	2,529,960
Caprock East (Devonian)	Fusselman	Lea	1951	10450	23,613,469
Carter South (San Andres)	San Andres	Lea	1955	5150	2,369,529
Casey (Strawn)	Strawn	Lea	1975	11326	3,414,520
Cass (Pennsylvanian)	Strawn	Lea	1944	3540	2,885,000
Caudill (Devonian)	Devonian	Lea	1954	13585	5,711,745
Caudill (Permo Penn)	Permo Penn	Lea	1956	10285	1,927,000
Cerca (Upper Pennsylvanian)	Upper Pennsylvanian	Lea	1968	10397	1,975,473
Corbin (Abo)	Abo	Lea	1959	8410	15,684,050
Corbin (Queen)	Queen	Lea	1938	4258	1,550,004
Corbin Central (Queen)	Queen	Lea	1985	4228	1,091,714
Corbin South (Wolfcamp)	Wolfcamp	Lea	1967	11000	6,609,050
Corbin West (Delaware)	Delaware	Lea	1976	5030	2,746,804
Crossroads (Pennsylvanian)	Upper Pennsylvanian	Lea	1949	9750	2,170,000
Crossroads (Siluro-Devonian)	Devonian	Lea	1948	12115	43,440,653
Crossroads East (Devonian)	Devonian	Lea	1956	12173	2,540,103
Crossroads South (Devonian)	Devonian	Lea	1954	12250	3,272,563
Crossroads West (Devonian)	Silurian	Lea	1959	12000	2,063,579
Cruz (Delaware)	Delaware	Lea	1961	5081	1,034,285
Dean (Devonian)	Devonian	Lea	1955	13600	3,034,645
Dean (Permo Penn)	Permo-Pennsylvanian	Lea	1955	11500	6,165,150
Denton (Devonian)	Siluro-Devonian	Lea	1949	11360	101,227,563
Denton (Wolfcamp)	Wolfcamp	Lea	1950	5656	41,755,373
Denton South (Devonian)	Siluro-Devonian	Lea	1955	13110	3,748,807
Dollarhide (Devonian)	Siluro-Devonian	Lea	1952	8167	9,179,120
Dollarhide (Ellenburger)	Ellenburger	Lea	1951	10135	3,512,341
Dollarhide (Fusselman)	Fusselman	Lea	1952	8710	6,620,935
Dollarhide (Queen)	Queen	Lea	1952	3670	6,743,430
Dollarhide (Tubb Drinkard)	Tubb Drinkard	Lea	1951	6616	24,207,673
Double A South (Abo)	Abo	Lea	1964	8900	1,970,186
Double A South (lower Abo)	Abo	Lea	1964	9300	1,076,771
Double X (Delaware)	Delaware	Lea	1961	4914	1,400,945
Drinkard (Drinkard)	Drinkard	Lea	1944	6500	74,707,203
Echols (Devonian)	Siluro-Devonian	Lea	1951	11500	4,622,000
Echols North (Devonian)	Devonian	Lea	1952	12057	1,416,811
EK (Bone Spring)	Bone Spring	Lea	1975	9450	1,883,915
E-K (Yates Seven Rivers Queen)	Yates Seven Rivers Queen	Lea	1954	4387	6,559,436
E-K East (Queen)	Queen	Lea	1957	4387	1,315,635
El Mar (Delaware)	Delaware	Lea	1959	4550	6,255,832
Eumont (Yates Seven Rivers Queen)	Yates Seven Rivers Queen	Lea	1953	2950	75,072,680
Eunice Monument (Grayburg San Andres)	Grayburg San Andres	Lea	1929	3950	392,454,534
Eunice North O & G (Blinebry Tubb Drinkard)	Blinebry Tubb Drinkard	Lea	1987	5700	24,720,888
Eunice South (San Andres)	San Andres	Lea	1969	3910	1,613,611
Eunice South (Seven Rivers Queen)	Seven Rivers Queen	Lea	1930	3610	32,423,951
Flying M (San Andres)	San Andres	Lea	1964	4400	11,164,009
Flying M South (Bough)	Permo-Pennsylvanian	Lea	1965	9020	1,211,000
Four Lakes (Devonian)	Fusselman	Lea	1956	12809	1,865,501
Fowler (Devonian)	Silurian	Lea	1955	7587	1,326,698
Fowler (Ellenburger)	Ellenburger	Lea	1949	9505	17,012,002
Fowler (upper Yeso)	Upper Yeso	Lea	1950	5705	4,923,367
Garrett West (Devonian)	Devonian	Lea	1970	12850	3,115,656
Gladiola (Devonian)	Devonian	Lea	1950	11859	52,841,901
Gladiola (Wolfcamp)	Wolfcamp	Lea	1950	9578	4,144,627

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Hare (Simpson)	Simpson	Lea	1947	4162	17,193,665
Hat Mesa (Delaware)	Delaware	Lea	1989	6834	1,976,201
High Plains (Permo Penn)	Permo-Pennsylvanian	Lea	1985	10400	1,056,081
Hightower East (Upper Pennsylvanian)	Upper Pennsylvanian	Lea	1959	10218	1,054,219
Hobbs (Drinkard)	Drinkard	Lea	1952	6880	3,091,100
Hobbs (Grayburg San Andres)	Grayburg San Andres	Lea	1928	4000	340,970,244
Hobbs (upper Blinebry)	Upper Blinebry	Lea	1968	5870	6,402,273
Hobbs East (San Andres)	San Andres	Lea	1951	4449	5,894,293
House (Drinkard)	Drinkard	Lea	1949	6980	1,678,305
Humble City South (Strawn)	Strawn	Lea	1982	11520	3,444,361
Hume (Queen)	Queen	Lea	1956	3950	1,389,000
Jalmat (Tansill Yates Seven Rivers)	Tansill Yates Seven Rivers	Lea	1953	2800	77,336,091
Jenkins (Cisco)	Upper Pennsylvanian	Lea	1963	9750	2,099,000
Johnson Ranch (Wolfcamp)	Wolfcamp	Lea	1985	13500	1,380,757
Justis (Blinebry Tubb Drinkard)	Blinebry Tubb Drinkard	Lea	1992	5720	30,206,714
Justis (Blinebry)	Blinebry	Lea	1958	7356	9,680,025
Justis (Ellenburger)	Ellenburger	Lea	1957	8115	7,663,268
Justis (Fusselman)	Fusselman	Lea	1958	5900	10,987,716
Justis (McKee)	McKee	Lea	1957	7700	1,312,000
Justis (Montoya)	Montoya	Lea	1958	6886	4,772,033
Justis (Tubb Drinkard)	Tubb Drinkard	Lea	1959	5837	3,869,009
Justis North (Fusselman)	Silurian	Lea	1961	7050	3,356,310
Kemnitz (lower Wolfcamp)	Lower Wolfcamp	Lea	1956	10742	16,608,371
Kemnitz West (Wolfcamp)	Wolfcamp	Lea	1963	10678	1,029,531
King (Devonian)	Devonian	Lea	1956	12439	6,238,669
King (Wolfcamp)	Wolfcamp	Lea	1951	10142	1,369,908
Knowles (Devonian)	Silurian	Lea	1949	12570	4,941,623
Knowles South (Devonian)	Devonian	Lea	1954	12140	9,712,376
Knowles West (Drinkard)	Drinkard	Lea	1975	8236	2,185,907
Lane (Wolfcamp)	Wolfcamp	Lea	1955	9700	1,028,000
Langley (Devonian)	Siluro-Devonian	Lea	1979	12150	1,370,899
Langlie Mattix (Seven Rivers Queen Grayburg)	Seven Rivers Queen Grayburg	Lea	1935	2852	136,874,684
Lazy J (Pennsylvanian)	Upper Pennsylvanian	Lea	1952	9600	7,630,855
Lea (Bone Spring)	Bone Spring	Lea	1960	9480	3,341,316
Lea (Devonian)	Siluro-Devonian	Lea	1960	3774	7,800,254
Lea (Pennsylvanian)	Morrow	Lea	1961	12900	1,433,818
Lea Northeast (Delaware)	Delaware	Lea	1988	5658	4,004,802
Leamex (Pennsylvanian)	Upper Pennsylvanian	Lea	1956	11340	1,367,438
Leonard South (Queen)	Queen	Lea	1948	3400	2,098,167
Livingston Ridge East (Delaware)	Delaware	Lea	1992	7200	1,992,444
Lovington (Abo)	Abo	Lea	1951	8340	33,983,198
Lovington (Devonian)	Devonian	Lea	1969	11570	1,735,773
Lovington (Grayburg San Andres)	Grayburg San Andres	Lea	1986	4700	14,689,351
Lovington (Paddock)	Paddock	Lea	1952	6150	17,571,938
Lovington Northeast (Pennsylvanian)	Strawn	Lea	1952	11256	16,921,580
Lovington West (Strawn)	Strawn	Lea	1985	11594	5,162,551
Lovington West (upper San Andres)	Upper San Andres	Lea	1990	4700	13,021,692
Lusk (Strawn)	Strawn	Lea & Eddy	1960	11168	20,682,947
Lusk West (Delaware)	Delaware	Lea	1987	6450	2,753,235
Lynch (Yates Seven Rivers)	Yates Seven Rivers	Lea	1929	3730	15,935,153
Maljamar (Abo)	Abo	Lea	1959	8977	1,029,476
Mason East (Delaware)	Delaware	Lea	1962	4370	1,427,836
McCormack (Silurian)	Fusselman	Lea	1947	7145	1,222,210
McCormack South (Silurian)	Silurian	Lea	1967	7100	1,015,681
Medicine Rock (Devonian)	Devonian	Lea	1961	12630	1,638,000
Mesa (Queen)	Queen	Lea	1962	3350	1,701,072
Mescalero (Devonian)	Silurian	Lea	1952	9850	5,832,949
Mescalero (San Andres)	San Andres	Lea	1962	4063	6,949,075
Mescalero Escarpe (Bone Spring)	Bone Spring	Lea	1984	8660	8,416,490
Midway (Abo)	Bone Spring	Lea	1963	8850	2,877,582
Monument (Abo)	Abo	Lea	1948	7180	7,139,437
Monument (Blinebry)	Blinebry	Lea	1948	5660	10,134,918
Monument (Paddock)	Paddock	Lea	1948	5190	10,547,574
Monument (Tubb)	Tubb	Lea	1959	3750	5,109,750
Monument North (Abo)	Abo	Lea	1977	7300	1,204,844
Moore (Devonian)	Silurian	Lea	1952	10100	22,218,658
Morton (Wolfcamp)	Wolfcamp	Lea	1964	10310	2,605,976
Morton East (Wolfcamp)	Wolfcamp	Lea	1970	10506	1,781,208
Nadine West (Blinebry)	Blinebry	Lea	1980	6008	2,678,000
Nonombre (Upper Pennsylvanian)	Upper Pennsylvanian	Lea	1965	10345	1,077,000
Oil Center (Blinebry)	Blinebry	Lea	1962	5907	8,244,514
Paddock (Paddock)	Paddock	Lea	1945	5170	30,191,406
Paddock South (Paddock)	Paddock	Lea	1957	5100	2,816,108
Paduca (Delaware)	Delaware	Lea	1960	4636	13,922,378
Pearl (Queen)	Queen	Lea	1955	8198	22,411,023
Pearsall (Queen)	Queen	Lea	1940	3685	2,968,614
Penrose (Skelly Grayburg)	Skelly Grayburg	Lea	1936	3435	21,616,809
Quail Ridge (Bone Spring)	Bone Spring	Lea	1962	9315	1,718,885
Quail Ridge (Morrow)	Morrow	Lea	1962	13300	1,832,787

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Querecho Plains (upper Bone Spring)	Bone Spring	Lea	1959	8538	2,370,677
Ranger Lake (Pennsylvanian)	Upper Pennsylvanian	Lea	1956	10300	5,084,059
Ranger Lake West (Devonian)	Silurian	Lea	1967	12850	1,185,371
Red Hills (Bone Spring)	Bone Spring	Lea	1992	12200	5,631,750
Red Tank (Bone Spring)	Bone Spring	Lea	1992	8820	1,068,622
Red Tank West (Delaware)	Delaware	Lea	1992	8330	4,873,021
Reeves (Pennsylvanian)	Strawn	Lea	1956	10950	1,286,874
Rhodes (Yates Seven Rivers)	Yates Seven Rivers	Lea	1927	3040	14,226,051
Saunders (Permo-Upper Penn)	Permo-Pennsylvanian	Lea	1980	9800	38,920,906
Saunders East (Permo Penn)	Permo-Pennsylvanian	Lea	1962	10363	2,716,804
Sawyer (San Andres)	San Andres	Lea	1947	5000	1,664,257
Sawyer West (San Andres)	San Andres	Lea	1969	4950	4,244,060
Scarborough (Yates Seven Rivers)	Yates Seven Rivers	Lea	1965	3050	17,437,636
Scharb (Bone Spring)	Bone Spring	Lea	1963	10152	14,101,640
Scharb (Wolfcamp)	Wolfcamp	Lea	1980	10519	1,199,917
Shipp (Strawn)	Strawn	Lea	1985	11138	7,624,050
Shoe Bar (Pennsylvanian)	Upper Pennsylvanian	Lea	1954	10440	1,056,568
Shoe Bar East (Devonian)	Devonian	Lea	1968	13013	1,944,953
Shoe Bar North (Strawn)	Strawn	Lea	1973	11275	1,297,324
Shoe Bar North (Wolfcamp)	Wolfcamp	Lea	1973	10456	1,706,095
Shugart East(Delaware)	Delaware	Lea	1985	5012	2,310,167
Skaggs (Drinkard)	Drinkard	Lea	1953	5266	2,986,271
Skaggs (Glorieta)	Glorieta	Lea	1958	5250	1,895,880
Skaggs (Grayburg)	Grayburg	Lea	1937	3608	11,117,325
Stateline (Ellenburger)	Ellenburger	Lea	1965	12100	4,191,567
Teague (Blinebry)	Blinebry	Lea	1967	5400	5,074,105
Teague (Ellenburger)	Ellenburger	Lea	1950	9700	2,485,768
Teague (Simpson)	Simpson	Lea	1948	9340	3,473,240
Teague North (Ellenburger)	Ellenburger	Lea	1988	10200	1,772,980
Teague Northwest (Devonian)	Devonian	Lea	1992	7450	1,001,274
Teas (Bone Spring)	Bone Spring	Lea	1963	9300	1,150,363
Teas (Yates Seven Rivers)	Yates Seven Rivers	Lea	1929	3343	3,555,628
Teas West (Yates Seven Rivers)	Yates Seven Rivers	Lea	1959	3225	1,966,523
Townsend (Permo-Upper Penn)	Permo-Upper Penn	Lea	1952	10400	24,101,823
Tres Papalotes (Pennsylvanian)	Upper Pennsylvanian	Lea	1970	10400	1,942,584
Tres Papalotes West (Pennsylvanian)	Upper Pennsylvanian	Lea	1972	10400	1,237,313
Tubb Oil & Gas (Tubb)	Tubb	Lea	1979	6000	7,131,218
Tulk (Pennsylvanian)	Upper Pennsylvanian	Lea	1965	9856	1,809,541
Tulk (Wolfcamp)	Wolfcamp	Lea	1951	9700	2,429,801
Vacuum (Abo reef)	Abo	Lea	1960	8650	91,163,873
Vacuum (Blinebry)	Blinebry	Lea	1963	6600	2,323,848
Vacuum (Drinkard)	Drinkard	Lea	1962	7600	4,363,153
Vacuum (Glorieta)	Glorieta	Lea	1963	6100	73,520,926
Vacuum (Grayburg San Andres)	Grayburg San Andres	Lea	1929	4900	341,873,609
Vacuum (Upper Pennsylvanian)	Upper Pennsylvanian	Lea	1964	10000	6,613,696
Vacuum (Wolfcamp)	Wolfcamp	Lea	1963	9950	6,660,250
Vacuum Mid (Devonian)	Devonian	Lea	1963	11644	1,766,983
Vacuum North (Abo)	Abo	Lea	1963	8500	52,981,986
Vacuum North (Atoka Morrow)	Atoka Morrow	Lea	1966	11960	1,458,355
Vacuum North (lower Wolfcamp)	Lower Wolfcamp	Lea	1967	10690	1,952,599
Vacuum South (Devonian)	Devonian	Lea	1958	11546	8,930,675
Wantz (Abo)	Abo	Lea	1950	6560	9,866,088
Wantz (Granite Wash)	Granite Wash	Lea	1963	7270	7,782,243
Warren (Warren)	Tubb	Lea	1958	6500	1,525,346
Warren Oil & Gas (Blinebry Tubb)	Blinebry Tubb	Lea	1957	5900	5,407,698
Weir (Blinebry)	Blinebry	Lea	1961	5700	1,786,126
Weir East (Blinebry)	Blinebry	Lea	1962	5800	1,010,761
Wilson (Yates Seven Rivers)	Yates Seven Rivers	Lea	1928	3815	9,303,607
Young (Queen)	Queen	Lea	1945	3765	2,367,621
Young North (Bone Spring)	Bone Spring	Lea	1980	8416	11,639,256
Bluitt (San Andres)	San Andres	Roosevelt	1963	4500	2,498,864
Milnesand (Pennsylvanian)	Upper Pennsylvanian	Roosevelt	1956	9202	1,001,000
Milnesand (San Andres)	San Andres	Roosevelt	1958	4554	12,034,011
Peterson South (Fusselman)	Fusselman	Roosevelt	1978	7800	3,386,739
Prairie South (Cisco)	Upper Pennsylvanian	Roosevelt	1960	9651	2,906,000
Todd (lower San Andres)	Lower San Andres	Roosevelt	1965	4440	2,952,336
Todd (Wolfcamp)	Wolfcamp	Roosevelt	1971	7580	1,115,408
Vada (Pennsylvanian)	Upper Pennsylvanian	Roosevelt & Lea	1967	9800	53,336,607