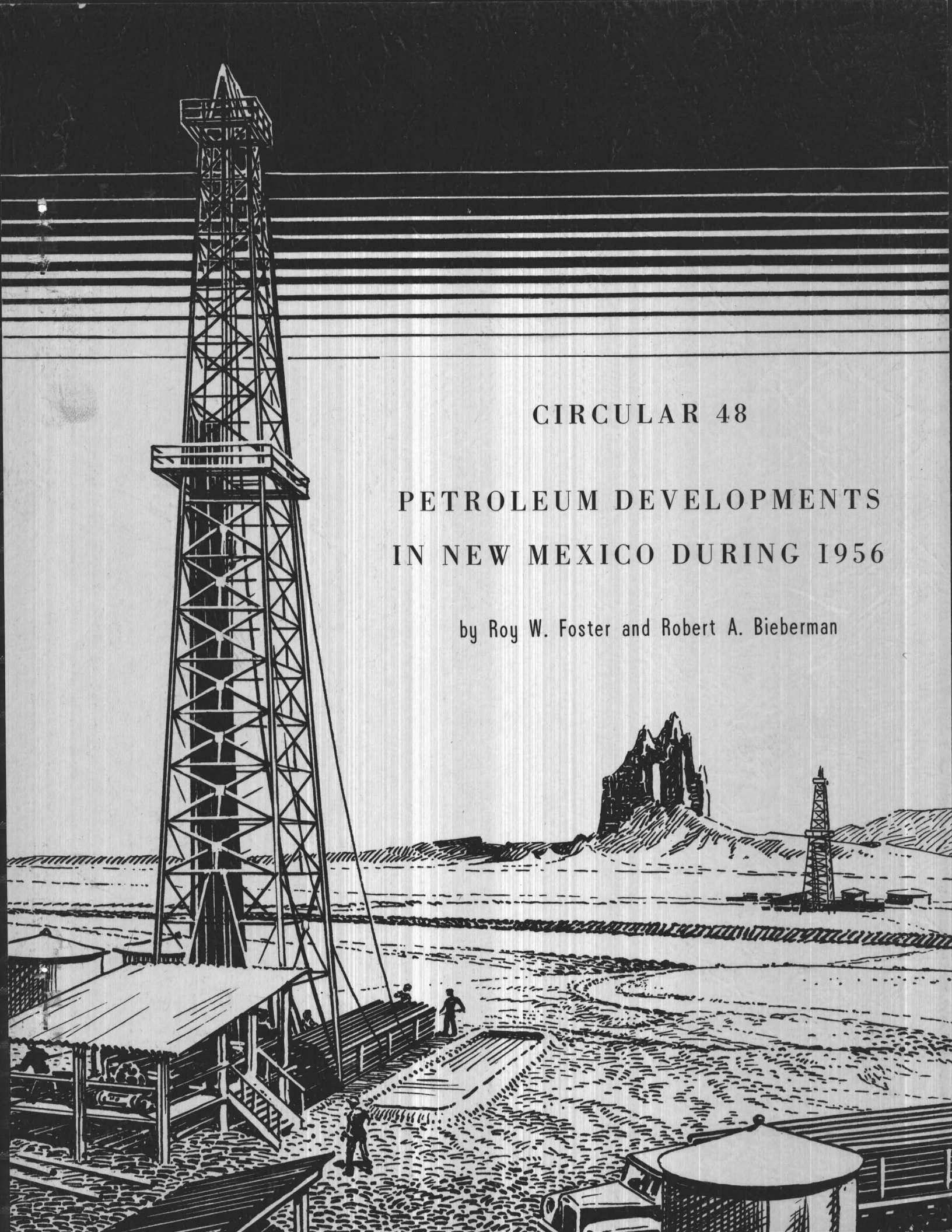

CIRCULAR 48

PETROLEUM DEVELOPMENTS IN NEW MEXICO DURING 1956

by Roy W. Foster and Robert A. Bieberman

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ABSTRACT

Production of both oil and gas set new records for the State of New Mexico during 1956. Total oil produced amounted to 87,920,489 barrels, and natural gas, 609,441,169,000 cubic feet. Nationwide, New Mexico ranks seventh in the production of crude oil and fourth in the production of natural gas. More than 2,000 wells were drilled in 1956, a slight increase over 1955. There was a decrease in the number of wells drilled in southeastern New Mexico, but this was more than offset by increases in the San Juan Basin. Eighty percent of all the wells drilled in the State were successfully completed, and 22 percent of the wildcat tests found new oil or gas fields.

A discussion of developments in each of the eight producing counties in New Mexico is included, together with maps showing the location of new discoveries, Wildcat tests were drilled in half of the remaining 24 nonproducing counties.

INTRODUCTION

Oil was discovered in southeastern New Mexico in 1909, at Dayton, in Eddy County, and in northwestern New Mexico in 1911, near Seven Lakes, in McKinley County. From these first small discoveries, the New Mexico petroleum industry has grown until it is now the largest mineral industry in the State. The importance of petroleum to the economy of New Mexico can be seen in the rapid yet stable growth of such communities as Roswell, Hobbs, and Farmington, located in the producing areas of the State. In 1956 the value of the oil and gas produced in New Mexico was in excess of 317 million dollars. The State now ranks seventh in the production of crude oil and fourth in the production of natural gas in the United States.

This report gives a summary of developments and important new discoveries of the year, and a comparison with the production records of preceding years.

PRODUCTION SUMMARY

Oil and gas were produced in 8 of the 32 counties in New Mexico during 1956. Production of oil showed an increase of about 6 million barrels over 1955 for a new record yearly production of 87,920,489 barrels (fig. 2). Almost 88 percent of all the crude oil produced in New Mexico came from Lea County, and 10 percent was produced in Chaves and Eddy Counties. San Juan, Rio Arriba, McKinley, Sandoval, and Roosevelt Counties, in that order, made up the remaining 2 percent.

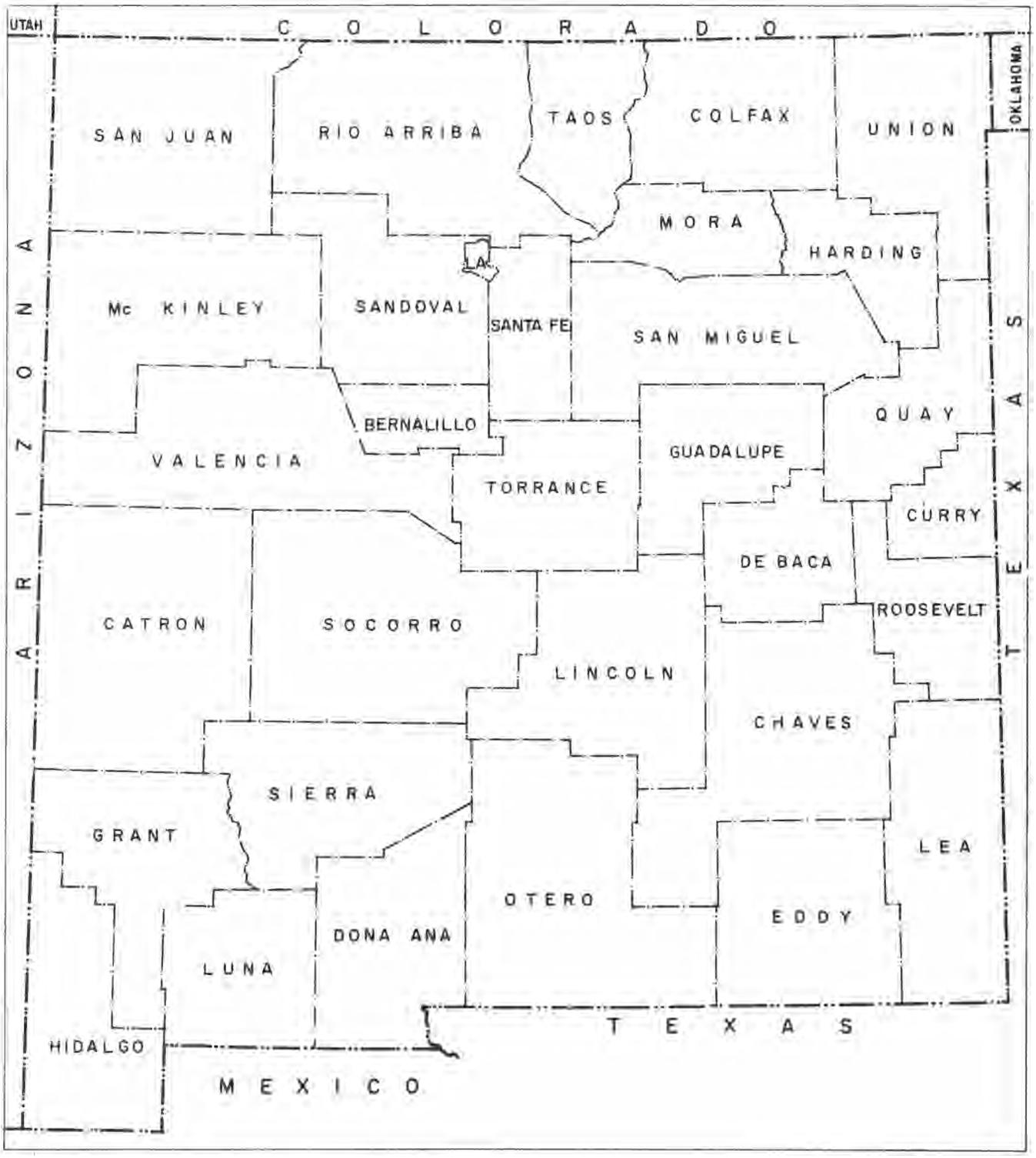


Figure I. County index mop of New Mexico

The development and extension of the large gas reserves in the San Juan Basin continued during 1956, showing an increased production of about 30 billion cubic feet over 1955. However, total gas production for the State was up 80 billion cubic feet in this period, with Lea County supplying more than half of this increase. Sixty-five percent of the natural gas produced came from Lea County, most of the remaining production being obtained from San Juan and Rio Arriba Counties. The Blanco Mesaverde pool in San Juan and Rio Arriba Counties is the largest gas field in the State. Other counties reporting some gas production were Eddy, Chaves, Roosevelt, and Sandoval. Total production for the State during 1956 was 609,441,169,000 cubic feet.

DRILLING SUMMARY

Drilling activity in the State showed a slight increase of 150 wells over 1955, for a total of 2,075 tests. There was a decrease in southeastern New Mexico wells drilled, but this was more than offset by increases in San Juan and Rio Arriba Counties.

The average depth per well was deeper in both producing sections of New Mexico. In the southeast, the average depth was 5,135 feet; in the northwest, 4,199 feet. The average depth for all the wells drilled in New Mexico was 4,494 feet, over 300 feet deeper than the average in 1955. The average depth per well in the United States in 1956 was 4,022 feet. Lea County led in both the total number of wells drilled and the total footage, followed by San Juan, Rio Arriba, and Eddy Counties.

During 1956, 80 percent of all the wells drilled were successful in finding oil or gas. Wells completed as oil producers numbered 946; gas wells, 719. Development wells (drilled within the preexisting boundaries of pools) totaled 1,432, of which 673 were completed as oil wells and 663 as gas wells; 96 were dry holes. Extension wells (drilled within 1 mile of a pool boundary) numbered 338, with 234 oil wells completed, 28 gas wells completed, and 76 dry holes. In 1956, 305 wildcat tests were drilled in New Mexico, of which 22 percent found production; 39 oil wells were completed, and 28 gas wells. The remaining 238 tests failed to find commercial quantities of oil or gas.

COUNTY SUMMARIES

Chaves County

Production of crude oil in Chaves County increased more than 1 million barrels over the record high for the county set in 1955. The total oil produced amounted to 4,774,841 barrels, as Chaves County supplanted Eddy County as the second largest oil-producing county in the State. Ninety-seven percent of the oil production in Chaves County comes from the Caprock Queen pool, which is now New Mexico's third largest oil pool. Gas production for 1956 was

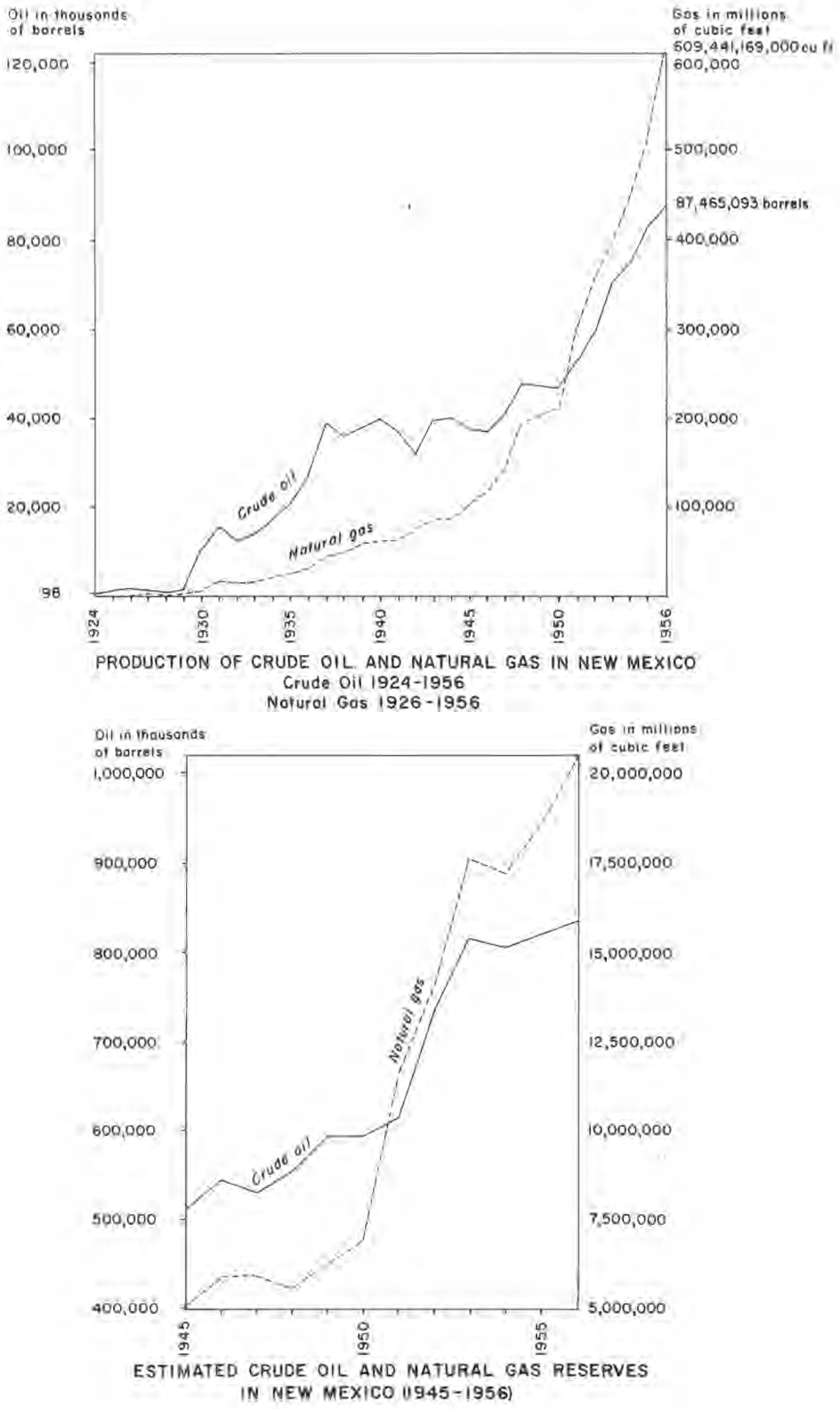


Figure 2. Production and reserves of crude oil and natural gas in New Mexico

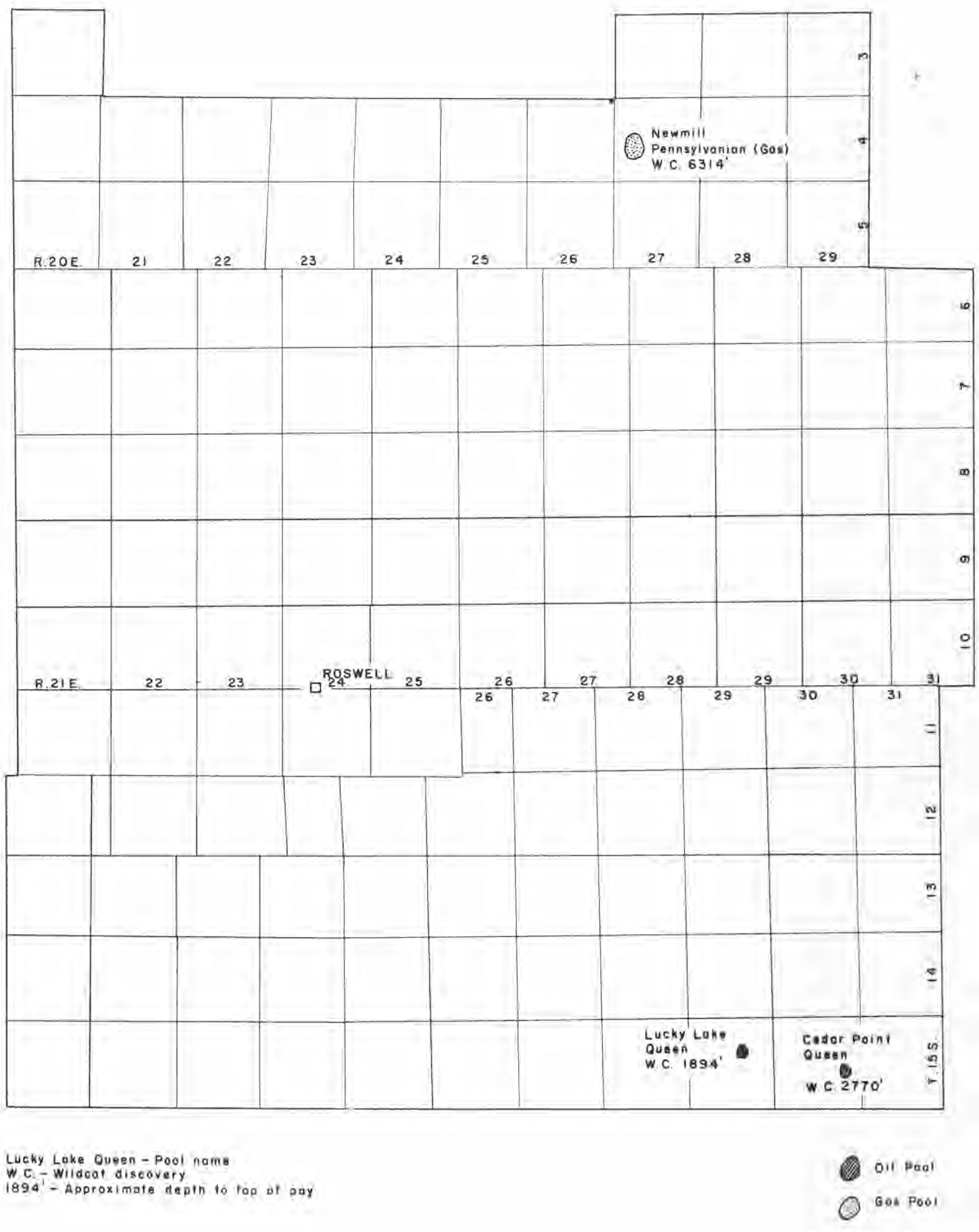


Figure 3. CHAVES COUNTY, 1956 Oil and Gas discoveries

1,667,141,000 cubic feet, most of which was obtained from the Caprock Queen pool. This is an increase of 700 million cubic feet over 1955.

Drilling activity slowed down considerably in Chaves County during 1956, with 123 wells drilled as compared to 323 completed in the preceding year, when development drilling in the Caprock pool reached its peak. Footage drilled in 1956 was 371,793 feet, or an average of 3,023 feet per well. The average depth per well was less in 1955, at 2,560 feet, but the total footage drilled was 826,969 feet.

Eighty-four (68 percent) of the 123 wells drilled were completed successfully for 83 oil wells and 1 gas well. Total wildcats drilled were 27, of which 3, or 11 percent, found new oil or gas fields. Thirty-nine wells were plugged or temporarily abandoned.

Wildcat wells found oil in the Queen formation west of the Caprock Queen pool, and gas in the Pennsylvanian (fig. 3). The Pennsylvanian gas well was probably the most important discovery in Chaves County during the year, and should increase the interest in deep drilling both in Chaves County and DeBaca County to the north.

Eddy County

Production of crude oil in Eddy County increased by about 1 million barrels over 1955 to a new yearly high of 4,564,655 barrels. Gas production also increased to 7,654,762,000 cubic feet for a new record high. Twenty percent of the oil production comes from the Grayburg Jackson pool, which is the largest oil and gas pool in the county. Others important oil fields are the Artesia and Loco Hills pools. Twenty-two percent of all the oil produced was obtained from the San Andres formation. Five gas pools producing from the Pennsylvanian accounted for 56 percent of the gas production.

Drilling activity showed a 61 percent increase over 1955, with a total of 277 wells completed. The Artesia pool, with 51 wells drilled, and the Atoka San Andres pool, with 34 completions, led the drilling activity in the county. Seventy-two percent of all the wells drilled were successful, resulting in 197 oil wells and 3 gas wells. Development wells totaled 133, of which 120 were successful, and 13 were dry holes. Seventy-one producing wells were completed out of the 96 extensions drilled, and 9 of the 47 wildcat tests found oil or gas. Total footage drilled in 1956 amounted to 700,459 feet, for an average depth per well of 2,529 feet. The average depth in 1955 was 3,049 feet, based on a total footage of 518,498 feet in 170 tests.

Twelve new oil pools were discovered in Eddy County during 1956 (fig. 4), 9 being the result of wildcat drilling. Successful wells found oil in the Yates, Seven Rivers, Grayburg, San Andres, and Delaware formations of Permian age, and gas in the Pennsylvanian.

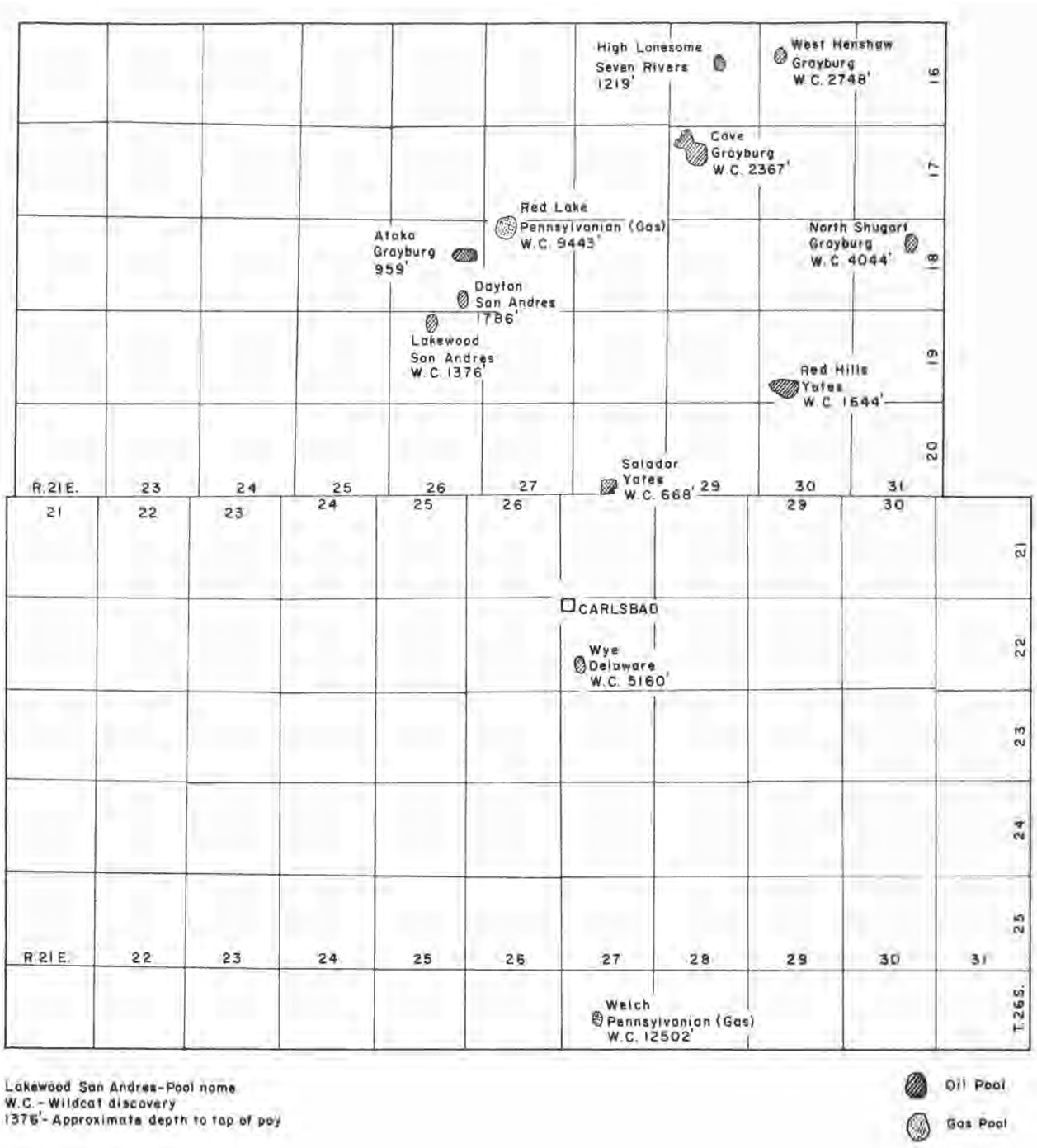
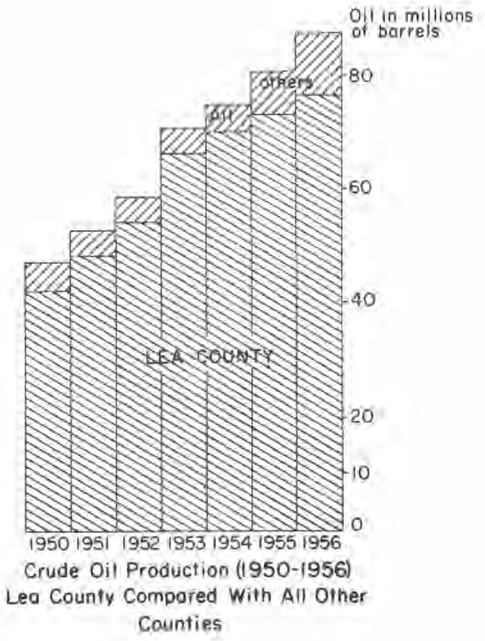
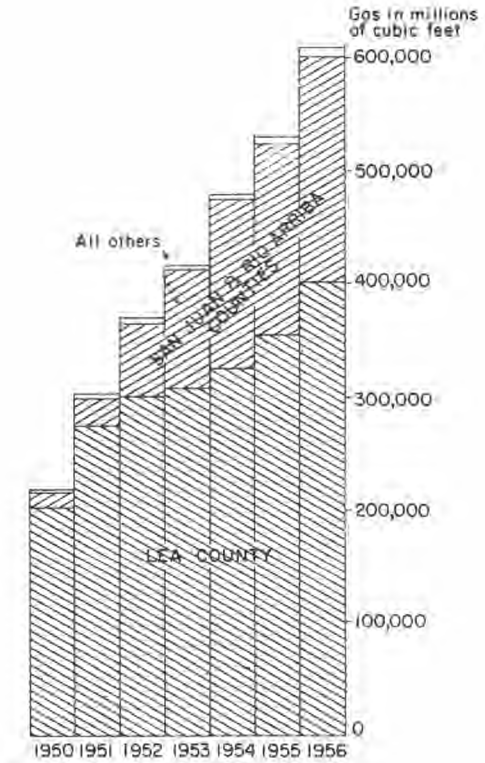


Figure 4. EDDY COUNTY, 1956 Oil and Gas discoveries



Crude Oil Production (1950-1956) Lea County Compared With All Other Counties



Natural Gas Production (1950-1956) Lea County Compared With San Juan and Rio Arriba, and All Other Counties

Figure 5. Production of crude oil and natural gas in Lea County compared with production in other counties, 1950-1956

Lea County

The production of oil and gas in Lea County continued an upward trend, setting a new high during 1956, with 76,954,315 barrels of oil produced and 400,811,611,000 cubic feet of gas. At the end of 1956 Lea County continued to lead the State in the production of both oil and gas (fig. 5). The Denton Devonian and the Eunice Monument Grayburg-San Andres pools are the largest oil pools in the State and accounted respectively for 10 percent and 9 percent of the county oil production for the year.

More than half the total oil produced in Lea County came from rocks of Permian age. In recent years production from the Devonian and Silurian has increased rapidly, accounting in 1956 for almost 30 percent of the total oil produced.

The largest gas pools in the county are the Calmat, producing from the Yates and Seven Rivers formations, and the Eumont, producing from the Yates, Seven Rivers, and Queen formations. Twenty-six percent of the total gas production in the county came from the Calmat pool, and 12 percent from the, Eumont pool. Important gas production is also obtained from the Grayburg, San Andres, and Blinebry formations.

Drilling activity remained about the same in 1956 as in the preceding year, with 721 wells drilled, compared with 728 in 1955. However, interest in the deeper pay intervals resulted in an increase of over 500,000 feet in the total footage drilled, which amounted to 4,691,386 feet, and a greater average depth per well of 6,507 feet, compared with 5,690 feet in 1955. Eighty-three percent of all the wells drilled in Lea County were successful. Pool wells totaled 487, with 452 successful completions and 35 dry holes. Oil wells numbered 490, gas wells 34, dual oil-gas wells 5, dual oil-oil wells 3, and dual gas-gas wells 1. Extension wells totaled 173, of which 42 were dry, 125 were completed as oil wells, and 6 were completed as gas wells. Sixty-one wildcats were drilled, with 20 percent finding production. Twenty percent of all the drilling in Lea County during the year was centered in the Eumont area, where 151 wells were drilled. Other active areas were the Langlie Mattix field, with 56 completions; Calmat, with 46; Eunice, South, with 41; and E. K. Queen pool, with 37.

Most of the important discoveries in Lea Country were in the deeper pay zones, particularly the Wolfcamp, Pennsylvanian, and Devonian (fig. 6). Five new Pennsylvanian oil pools in widely separated areas were designated during the year, and gas was discovered north of the Mescalero Pennsylvanian oil pool in the northern part of the •county. Two wildcat discoveries in the Devonian did not appear very favorable, but offsets from other Devonian pools, and Devonian pays below Wolfcamp or Pennsylvanian producing intervals, were highly successful.

McKinley County

Of twenty-eight wells drilled in McKinley County during 1956, only 1 well reported production (fig. 7). The discovery well, a wildcat, reported three

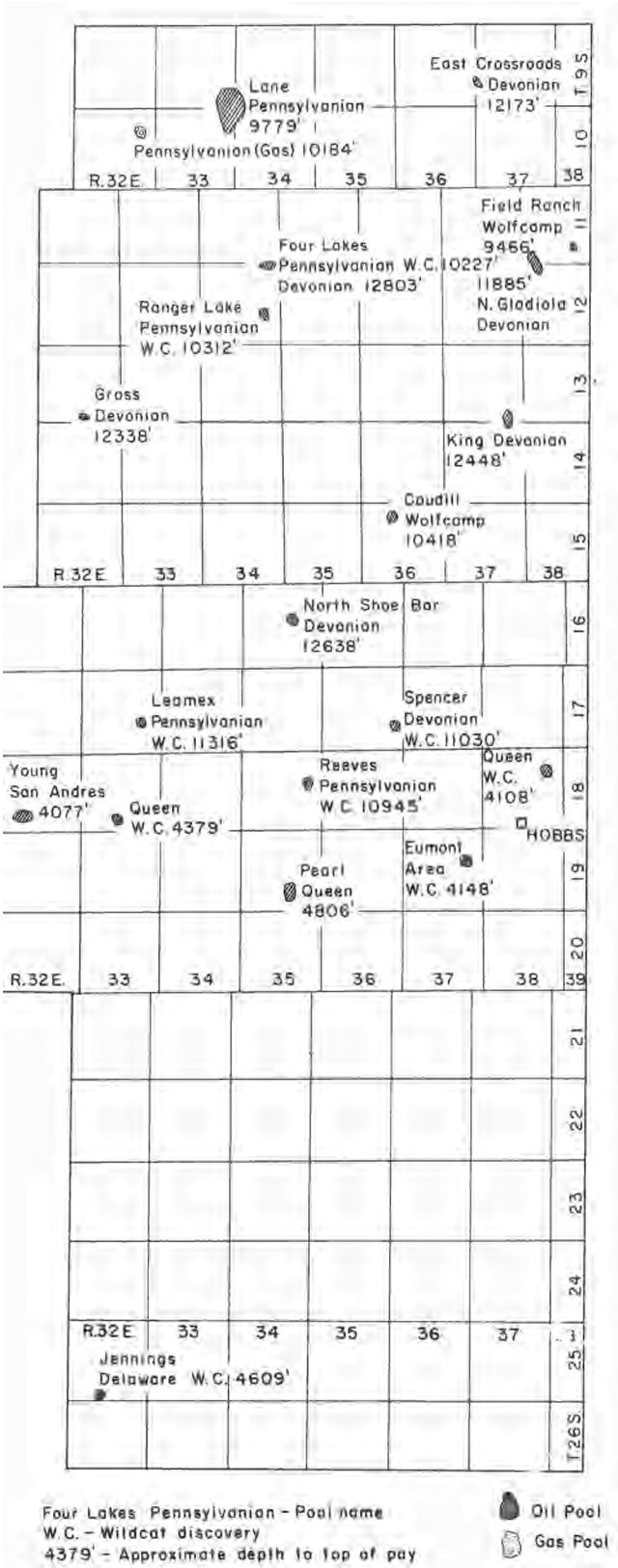


Figure 6. LEA COUNTY, 1956 Oil and Gas discoveries

barrels of oil a day from the lower Mangos. The well is located on Walker Dome, north of Bluewater. The average depth of wells drilled in McKinley County during 1956 was 2,110 feet, and the total footage drilled was 63,285 feet.

All the oil production reported came from the Hospah pool, and amounted to 132,426 barrels. No gas was reported.

Rio Arriba County

Drilling activity increased in Rio Arriba County from 300 tests in 1955 to 362 in 1956. The average depth per well was 4,146 feet, with a total footage drilled of 1,500,983 feet. Ninety-three percent of all the wells drilled in the county were completed successfully, including 3 oil wells and 332 gas wells. There were 27 dry holes. Most of the activity was centered in the development of preexisting pools, such as the South Blanco Pictured Cliffs pool, with 105 tests drilled, and the Blanco Mesaverde pool, with 104 tests. In all, 310 development wells were drilled, 300 being completed as gas wells; the remaining 10 were plugged and abandoned. Seventeen extension wells were drilled and completed as gas wells. Fifty-one percent of the 35 wildcats drilled during the year were successfully completed, with the discovery of 3 oil wells and 15 gas wells (fig. 8). The new oil discoveries were completed in the Gallup sandstone in the southwestern part of the county, and most of the new gas discoveries were completed in the Pictured Cliffs sandstone.

Production of gas reached an all-time high during 1956 and was almost double the previous record high set in 1955. The total gas produced was 43,040,091,000 cubic feet, of which 60 percent was produced from that part of the Blanco Mesaverde pool lying within Rio Arriba County. The second largest gas pool in the county is the South Blanco Pictured Cliffs pool, which accounted for 25 percent of the gas produced during the year.

Oil and distillate production increased by about 50,000 barrels over 1955 and totaled 405,378 barrels. Eighty percent of the total oil production in the county for 1956 came from the South Blanco Tocito pool.

Roosevelt County

Three wells were drilled in Roosevelt County during the year at an average depth of 9,518 feet per well. One of the three wells drilled reported an initial production of 218 barrels of oil a day from the Pennsylvanian. The area has been designated the Milne sand Pennsylvanian pool (fig. 9). Total production of oil was 10,533 barrels, and gas produced with oil amounted to 7,387,000 cubic feet. All the oil and gas production was obtained from the Milne sand Pennsylvanian pool.

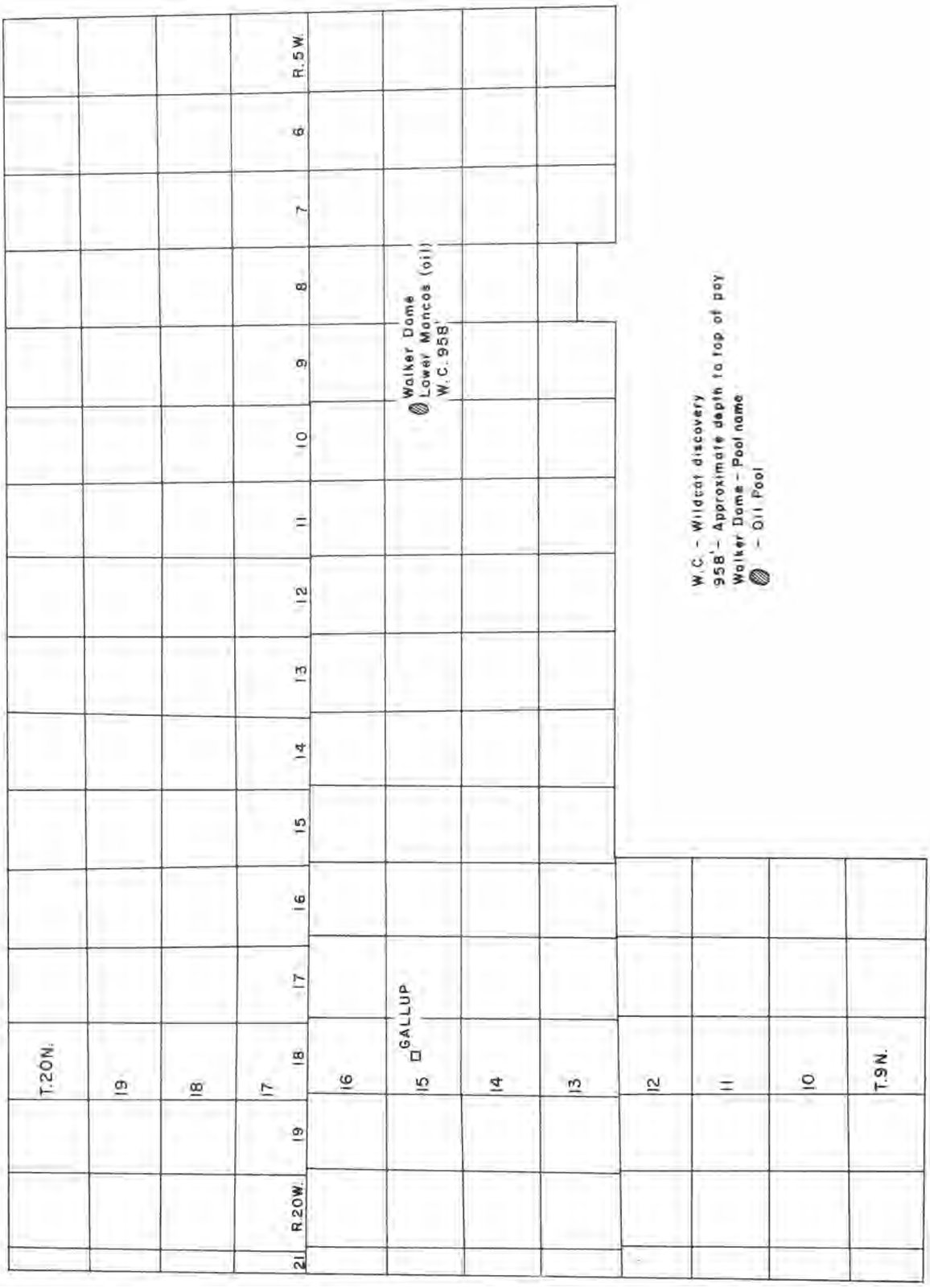


Figure 7. McKINLEY COUNTY, 1956 Oil and Gas discoveries

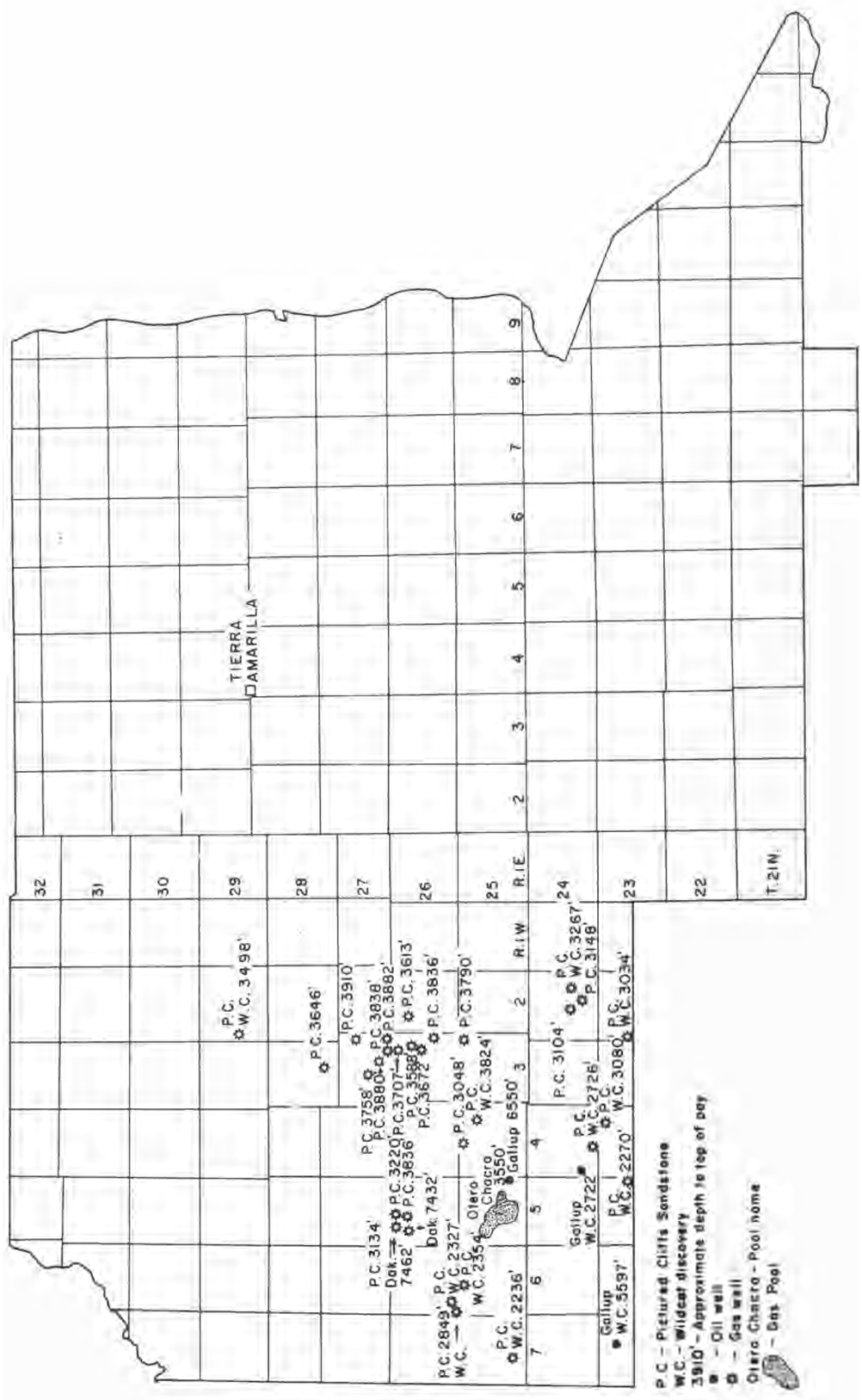


Figure 8. RIO ARR1BA COUNTY, I956 Oil and Gas discoveries

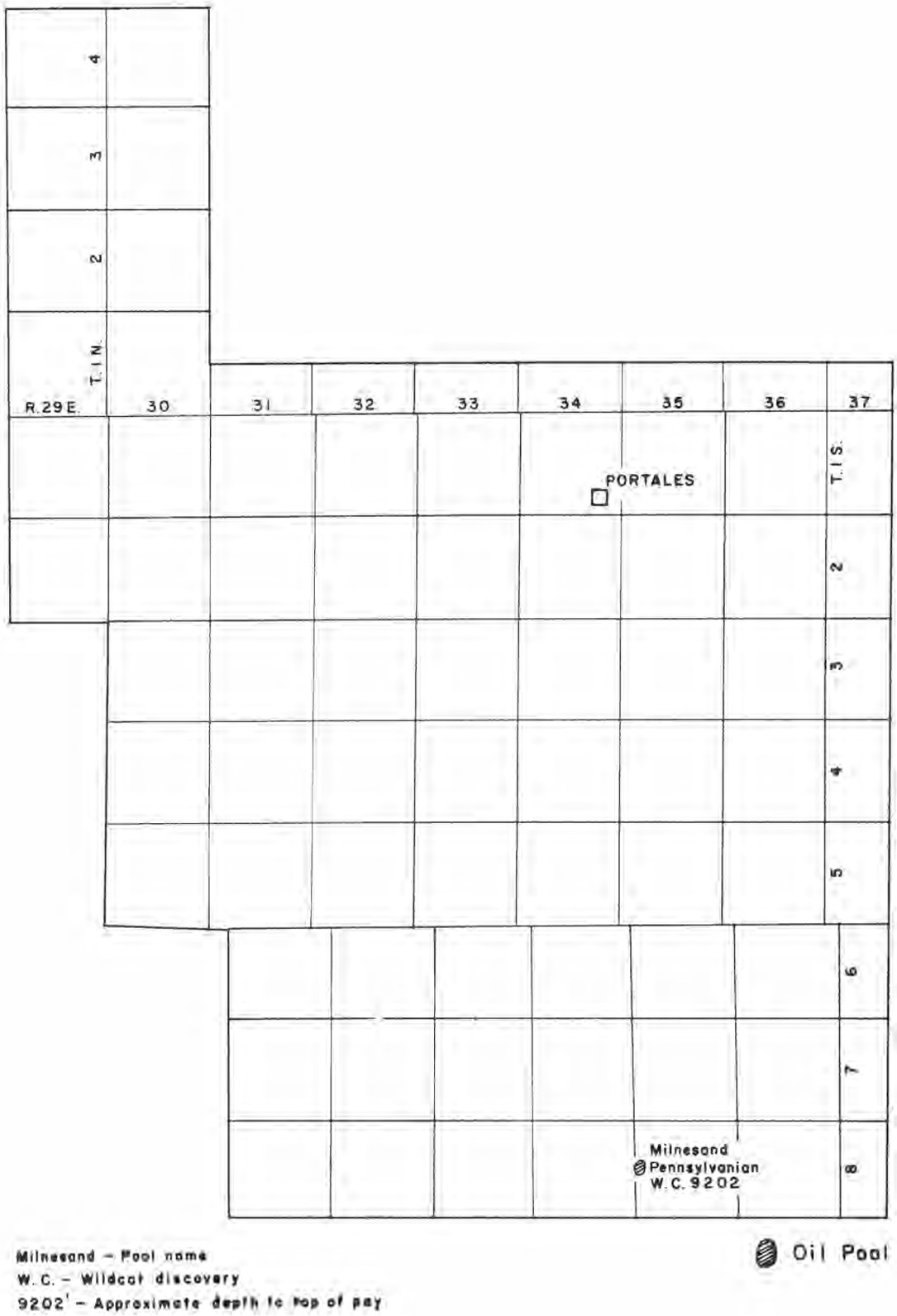


Figure 9. ROOSEVELT COUNTY, 1956 Oil discoveries

Sandoval County

Nineteen wells were drilled in Sandoval County for a total footage of 81,267 feet, and an average depth per well of 4,277 feet. Only 1 development test and 1 extension were drilled during the year. The extension test to the Otero Point Lookout pool was completed in the Point Lookout for an initial production of 28 barrels of oil per day. The development well drilled to the Entrada sandstone in the Media pool was dry and abandoned. Two wildcat tests found oil in the Gallup sandstone, and 4 other wildcats were completed in the Pictured Cliffs sandstone as gas wells (fig. 10), All these completions were in northern Sandoval County. The other 11 wildcats were plugged and abandoned.

Production of oil and gas increased slightly over 1955. Oil production amounted to 16,539 barrels, and gas, 5,372,000 cubic feet. All the gas reported was produced from the Otero Sanastee pool, which also accounted for 40 percent of the oil produced during 1956.

San Juan County

New records for the production of both oil and gas were set in San Juan County during 1956. Production of oil and distillate increased by more than 100 percent over the 1955 production figure. Total oil production for 1956 was 1,061,802 barrels , of which 38 percent came from the Bisti Gallup pool. Other oil production of note was from the Verde Gallup and Hogback Dakota pools. Gas production was up about 12 billion cubic feet over 1955, totaling 156,254,805,000 cubic feet. Sixty-eight percent of the gas produced during 1956 came from that part of the Blanco Mesaverde pool lying within San Juan County.

Drilling activity also set new highs for San Juan County, with 508 wells completed during the year, compared with 360 in 1955. The total footage drilled was 1,805,037 feet, for an average depth per well of 553 feet. Eighty-six percent of the wells drilled found production, with 102 oil wells and 336 gas wells completed. Most of the drilling activity centered in the development of preexisting pools, such as the Blanco Mesaverde and Bisti Gallup. Development wells totaled 438, with the completion of 81 oil wells and 327 gas wells; there were 30 dry holes. Only 17 extension wells were drilled, 12 being completed as oil wells , and 5 as gas wells. Twenty-five percent of the 53 wildcats drilled in the county during 1956 were completed successfully, with the discovery of 9 oil wells and 4 gas wells (fig. 11). Most of the new oil discoveries were completed in the Gallup sandstone, although some oil was found also in the Mancos and Dakota formations. A test in the Four Corners area of northwestern San Juan County was completed for an initial production of 369 barrels of oil a day in the Paradox member of the Hermosa formation. Wildcat gas discoveries were drilled in the Pictured Cliffs sandstone, Chacra sandstone, Fruitland formation, Gallup sandstone , and Dakota formation.

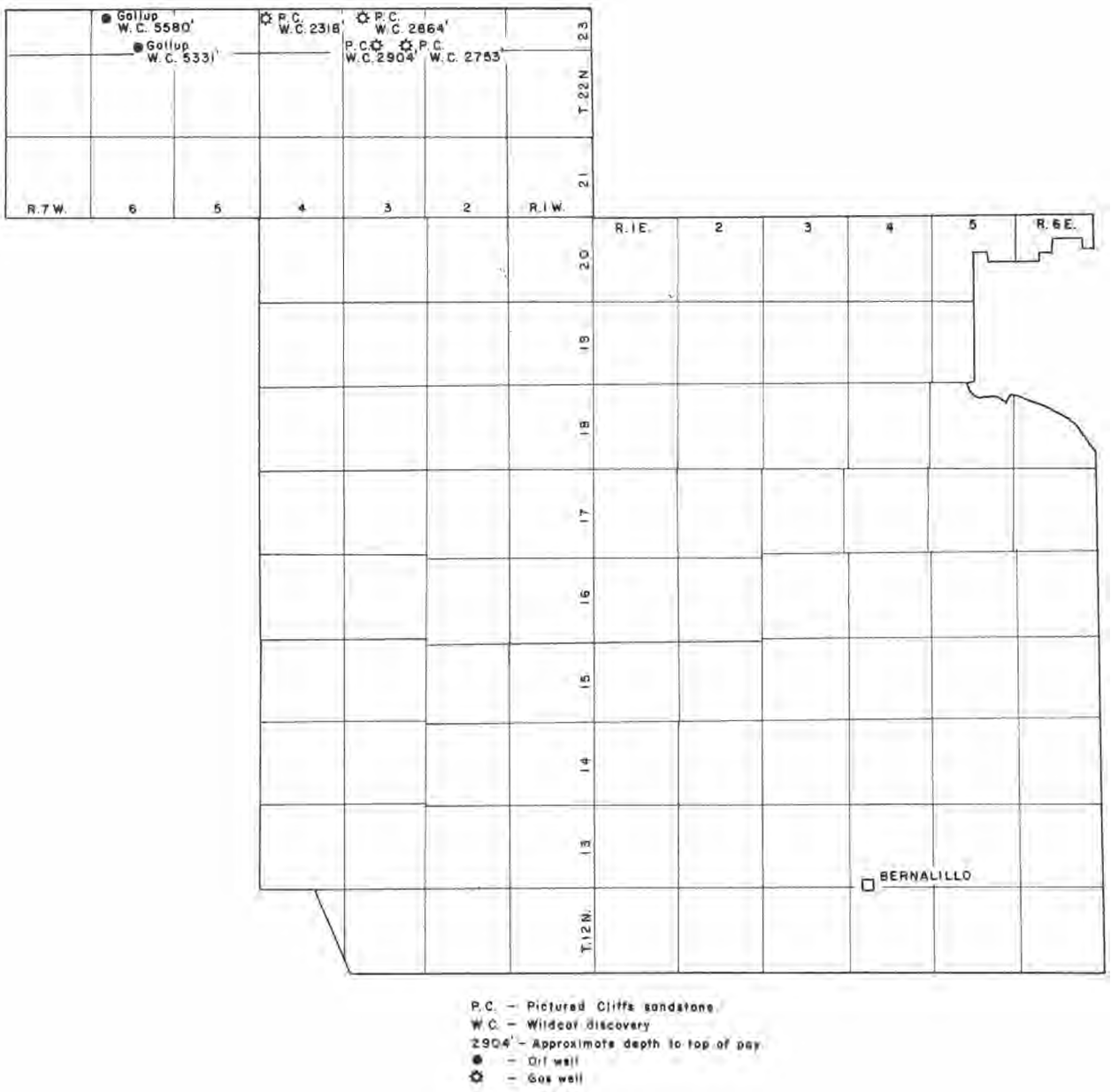


Figure 10. SANDOVAL COUNTY, 1956 Oil and Gas discoveries

Figure II. SAN JUAN COUNTY, 1956 Oil and Gas discoveries

Other Counties

Outside the 8 producing counties in New Mexico, some drilling activity was carried on in 12 other counties. A total of 34 wells were drilled in Catron, Colfax, Curry, DeBaca, Guadalupe, Harding, Lincoln, Quay, San Miguel, Sierra, Torrance, and Union Counties. The average depth of these wells was 2,442 feet. Except for McKinley County, this is less than the average depth drilled in the producing counties. Only one of the wells drilled found production; this was in the Bueyeros area of Harding County, where carbon dioxide is recovered.

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