Oil and gas discovery wells drilled in New Mexico in 1981

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Oil and gas discovery wells drilled in New Mexico in 1981

by *R. F. Broadhead*, Petroleum Geologist, New Mexico Bureau of Mines and Mineral Resources, Socorro, New Mexico

Introduction

Drilling for oil and gas in New Mexico reached a record high in 1981. Statistics obtained from the New Mexico Oil Conservation Division indicate that there were 2,867 wells completed in New Mexico in 1981; this sets a new record for completions and surpasses the old record of 2,218 wells set in 1980. In the Permian Basin of southeast New Mexico, 1,348 wells were completed with 655 wells completed as oil producers and 448 completed as gas producers for a success rate of 81.8%. On the Bravo dome in northeast New Mexico, 140 wells were completed as carbon-dioxide producers. In the San Juan Basin of northwest New Mexico, 1,379 wells were completed; 218 of these are oil wells and 1,128 are gas wells, calculating to a success rate of 97.6%. In the not-yet-productive Raton Basin of Colfax County and Hagan Basin of Santa Fe County, wildcats encountered promising shows of oil and gas from Cretaceous rocks. A record 14,076,000 ft of well were drilled in New Mexico in 1981, surpassing the old record of 11,278,000 ft set in 1980. The average depth of wells drilled in 1981 is 4,910 ft, 175 ft less than the average depth of wells drilled in 1980.

Fig. 1 shows the locations of the significant wells drilled in New Mexico in 1981; table 1 summarizes the significant wildcat discoveries and table 2 summarizes the significant wildcat dry holes. For purposes of this paper, a significant wildcat discovery is defined as a well in which commercial amounts of oil or gas from a formation have been discovered at a distance of more than 5 mi from the limits of previously discovered fields with commercial production from that formation. A significant wildcat dry hole is defined as a well drilled in an unproductive basin or part of a basin that encountered an encouraging show of hydrocarbons before being abandoned.

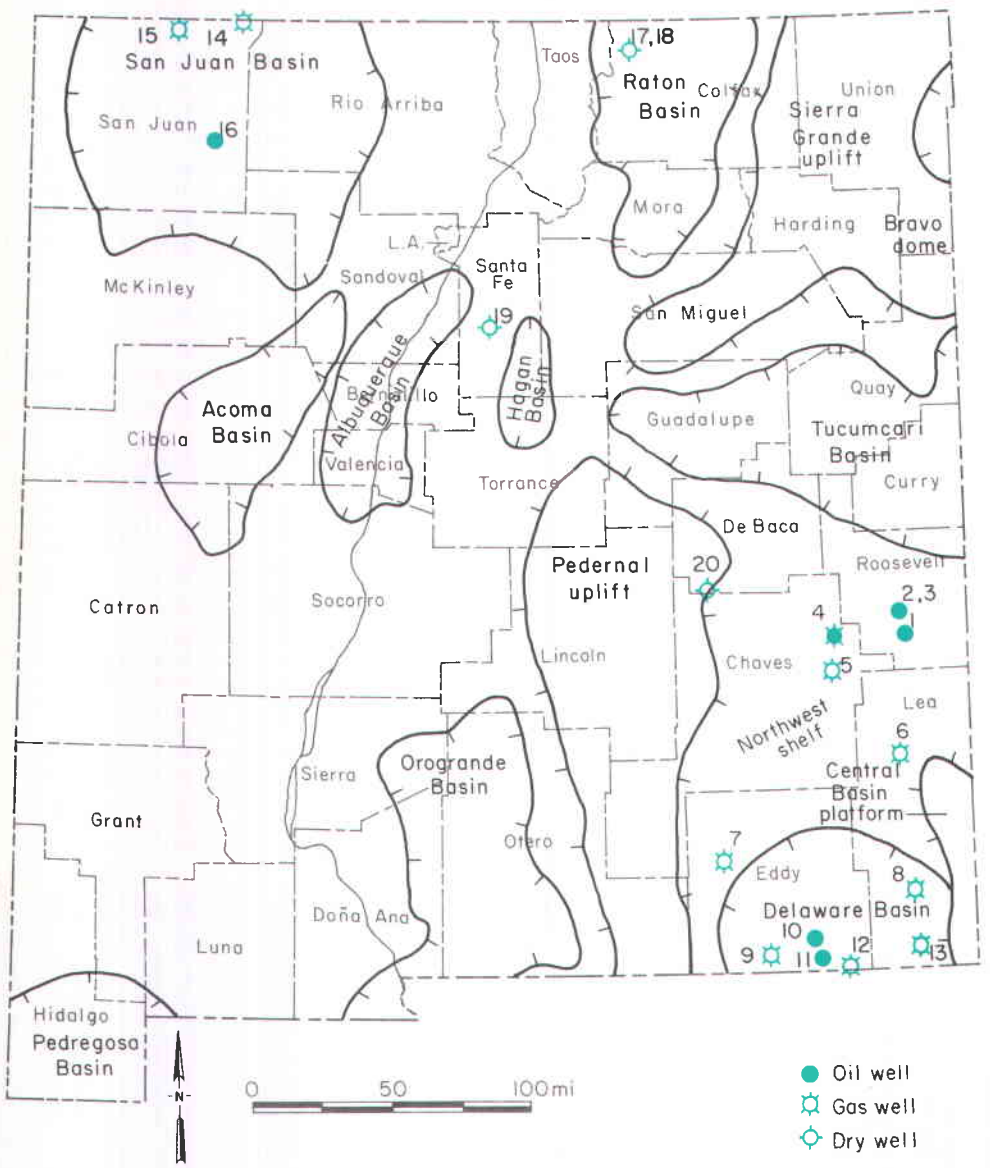

FIGURE 1—SIGNIFICANT OIL AND GAS DISCOVERIES AND WILDCAT DRY HOLES DRILLED IN NEW MEXICO DURING 1981. Major geologic features are taken from Ingersoll and Kelley (1979), Meyer (1966), Molenaar (1977), Roberts and others (1976), and Thompson and others (1978). See tables 1 and 2 for details.

Southeast New Mexico

Drilling activity has been high in all four geologic subdivisions of the Permian Basin in southeast New Mexico: the Roosevelt uplift, the northwest shelf of the Delaware Basin, the Delaware Basin, and the Central Basin platform. These areas yielded several significant oil and gas discoveries in 1981 (fig. 1; table 1). Kinney (1967, p. 26–27) presented stratigraphic charts of oil- and gas-producing units in southeast New Mexico.

On the Roosevelt uplift in southeast Roosevelt County, three new discoveries have ex-

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ALSO IN THIS ISSUE:

COMING SOON

Pajarito fault zone of Española Basin
Cretaceous leaf locality in lower Kirtland Shale Member

tended northward the limits of production from Mississippian and Pennsylvanian rocks (fig. 1; table 1). Particularly impressive were the twin discovery wells drilled by Enserch Exploration in sec. 6, T. 5 S., R. 33 E.; the Enserch No. 1 Finley was completed in the Mississippian for an initial production of 116 barrels of oil per day (BOPD) and 23 barrels of water per day (BWPD); the No. 1 Annie Harvey yielded 243 BOPD and 113 BWPD from Pennsylvanian strata. This Pennsylvanian oil has an extremely high gravity of 46.9 degrees. Development drilling on the Roosevelt uplift was targeted mainly at Pennsylvanian and Permian rocks.

The northwest shelf of the Delaware Basin is currently the most active area in southeast New Mexico. Primary drilling targets are sandstones in the Abo Formation (Permian) of north-central Chaves County. Drilling boomed after these sandstones were designated by the Federal Energy Regulatory Commission as tight gas sands. This designation allows producers to negotiate for wellhead prices as high as $4.92 per thousand ft^3 (MCF), as opposed to a ceiling price of $2.81 per MCF for gas without the tight-sand designation (Wheatley, 1981). Several new Abo gas fields were discovered in 1979 and 1980. Drilling in 1981 has been confined mostly to development of these fields, although some wildcats have been drilled. Wells are typically 4,000–5,000 ft deep and have initial potentials of 1 million ft^3 of gas per day (MMCFGPD) to 3 MMCFGPD. Presently, production is limited to north-central Chaves County. The Mesa Petroleum No. 1 Devils Federal, an important wildcat located in southwest De Baca County (fig. 1; table 2), tested noncommercial amounts of gas in the Abo. This encouraging show indicates that the Abo play may extend the northern limit of the present producing area up into De Baca County.

Elsewhere on the northwest shelf, the Harper Oil Company No. 1 Newlin discovered both oil and gas in the Strawn Series (Pennsylvanian) and the AMOCO No. 1 O'Brien Ranch found gas in the Mississippian. Both of these wells are located in eastern Chaves County, which also is the site of much development drilling for oil in the San Andres Formation (Permian).

In the Delaware Basin of Eddy and western Lea Counties, several exciting wildcat discoveries have been made as well as a great deal of development drilling in 1981. Development targets are gas in the Morrow and Atoka Series (Pennsylvanian) and oil in the Wolfcamp Series and Bone Spring Limestone (Permian). Three wildcats, the Superior Oil Company No. 1 Meander Federal, the HCW Exploration No. 1 Dorstate, and the Florida Exploration Company No. 10 Ross Draw Unit, have extended Wolfcamp, Bone Spring, and Morrow production into south-central Eddy County (fig. 1, table 1), an area which previously was relatively barren of production.

On the Central Basin platform of eastern Lea County, development drilling of shallow oil reservoirs in the San Andres, Grayburg, Queen, Seven Rivers, and Yates Formations (Permian) predominates and wildcat activity is minimal. No outstanding discoveries have been drilled in 1981 on the Central Basin platform.

Northwest New Mexico

The San Juan Basin of northwest New Mexico has seen a high level of drilling activity in 1981. Most of this drilling has been concentrated in San Juan and western Rio Arriba Counties. Few wildcats have been drilled, but the pace of development drilling in existing fields has been hot. Major development targets in the San Juan Basin are the Entrada Sandstone (Jurassic) and the Dakota Sandstone (Cretaceous), and sandstones of the Mesaverde Group (Cretaceous) including the Gallup, Chacra, and Pictured Cliffs Sandstones. The stratigraphy of these units is reviewed by Green and Pierson (1977) and Molenaar (1977).

Impressive wildcat discoveries in the San Juan Basin have been in the Gallup Sandstone and Greenhorn Limestone Member of the Mancos Shale (Cretaceous). Gas was discovered in the Gallup by the Bixco No. 2 Trail Canyon in northeast San Juan County (fig. 1; table 1). Initial flow was 12,195 thousand ft^3 of gas per day (MCFGPD). This discovery is 22 mi east of previously established Gallup production. Although reported as Gallup production, the gas may actually be coming from the Tocito sandstone, a basinward equivalent of the Gallup (Molenaar, 1977, p. 162). Oil was found in the Greenhorn by the Consolidated Oil and Gas No. 2-E Navajo, also in San Juan County (fig. 1; table 1). Initial production was 53 BOPD and 44 BWPD. This is a shallower pool discovery in the Basin Dakota field. Gas was found in both the Gallup and the Greenhorn in San Juan County by the AMOCO Production Co. No. 1 Stanolind Gas Commission B which had an initial potential of 2,891 MCFGPD.

Northeast New Mexico

The Bravo dome in Union, Harding, and Quay Counties has been a hotbed of drilling

TABLE 1—SIGNIFICANT WILDCAT DISCOVERIES IN NEW MEXICO IN 1981; the term "formation" is used in an informal sense. **NR**, not released; **BOPD**, barrels of oil per day; **BWPD**, barrels of water per day; **MCFGPD**, thousand ft^3 of gas per day; and **OWWO**, old well worked over.

Number on fig. 1	Location (section–township–range, county)	Operator, well number, and lease	Completion date (month/year)	Total depth (ft)	Formation at total depth	Producing formation	Producing interval (ft)	Initial potential	Gravity (degrees API)
1	33-6S-34E Roosevelt	Energy Reserve Group, Inc. No. 1 El Paso State	1/81	8,200	Granite Wash	Cisco (Pennsylvanian)	7,679–7,704	80 BOPD + 27 BWPD	NR
2	6-5S-33E Roosevelt	Enserch Exploration, Inc. No. 1 Finley	4/81	8,500	Precambrian	Mississippian	8,250–8,302	116 BOPD + 23 BWPD	40.8
3	6-5S-33E Roosevelt	Enserch Exploration, Inc. No. 1 Annie Harvey	7/81	8,383	Mississippian	Pennsylvanian	8,190–8,196	243 BOPD + 13 BWPD	46.9
4	24-6S-29E Chaves	Harper Oil Co. No. 1 Newlin	2/81	8,325	Precambrian	Strawn (Pennsylvanian)	7,403–7,412	300 MCFGPD + 9 BOPD + 15 BWPD	46.8
5	26-8S-29E Chaves	AMOCO Production Co. No. 1 O'Brien Ranch	5/81	9,174	Fusselman (Silurian)	Mississippian	8,398–8,520	745 MCFGPD	NR
6	32-13S-34E Lea	AMOCO Production Co. No. 3 State 'FO' (OWWO)	6/81	14,438	Devonian	Atoka–Morrow (Pennsylvanian)	12,230–12,565	6,458 MCFGPD	—
7	25-19S-23E Eddy	Mesa Petroleum Corp. No. 1 Siegrest State	4/81	8,660	Mississippian	Wolfcamp (Permian)	6,218–6,224	1,200 MCFGPD 1,450 MCFGPD	—
8	33-21S-34E Lea	Minerals, Inc. No. 1 Llano '33' State (OWWO)	7/81	13,403	Chesterian (Mississippian)	Atoka (Pennsylvanian)	12,851–12,857		—
9	14-25S-25E Eddy	Superior Oil Co. No. 1 Meander Federal	1/81	11,641	Morrow (Pennsylvanian)	Wolfcamp (Permian)	9,390–?	5,835 MCFGPD	—
10	33-24S-28E Eddy	Maddox Energy Corp. No. 1 Union Federal	8/81	7,560	Bone Spring (Permian)	Bone Spring (Permian)	6,155–7,058	41 BOPD + 152 BWPD	NR
11	27-25S-28E Eddy	HCW Exploration, Inc. No. 1 Dorstate	8/81	8,000	Bone Spring (Permian)	Bone Spring (Permian)	6,412–7,890	37 BOPD + 80 BWPD	39
12	27-26S-30E Eddy	Florida Exploration Co. No. 10 Ross Draw Unit	7/81	14,450	Morrow (Pennsylvanian)	Morrow (Pennsylvanian)	14,305–14,405	2,946 MCFGPD	NR
13	11-24S-28E Lea	Florida Exploration Co. No. 1 Reno Commission	6/81	19,160	Fusselman (Silurian)	Morrow (Pennsylvanian)	15,246–15,398	3,942 MCFGPD	—
14	18-32N-8W San Juan	Bixco, Inc. No. 2 Trail Canyon	5/81	7,597	Cretaceous	Gallup or Tocito (Cretaceous)	7,559–7,597	12,195 MCFGPD	NR
15	9-32N-12W San Juan	AMOCO Production Co. No. 1 Stanolind Gas Commission B	1/81	7,109	Cretaceous	Gallup and Greenhorn (Cretaceous)	5,968–6,260 6,722–6,778	2,523 MCFGPD (Gallup) 368 MCFGPD (Greenhorn)	—
16	11-25N-10W San Juan	Consolidated Oil & Gas No. 2-E Navajo	1/81	6,700	Cretaceous	Greenhorn (Cretaceous)	6,458–6,506	53 BOPD + 44 BWPD	NR

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TABLE 2—SIGNIFICANT WILDCAT DRY HOLES IN NEW MEXICO IN 1981; the term "formation" is used in an informal sense. **D&A**, dry and abandoned; **MCFGPD**, thousand ft³ of gas per day.

Number on fig. 1	Location (section-township-range, county)	Operator, well number, and lease	Completion date (month/year)	Total depth (ft)	Formation at total depth	Completed status	Comments
17	34-31N-17E Colfax	Pennzoil Co. No. 1 Vermejo Ranch	6/81	4,380	Niobrara (Cretaceous)	D & A	Show of gas in Trinidad Sandstone (Cretaceous) with 6 ft flare
18	1-31N-17E Colfax	Pennzoil Co. No. 2 Vermejo Ranch	7/81	3,737	Niobrara (Cretaceous)	Reported shut in	Tested 691 MCFGPD from Pierre shale (Cretaceous)
19	26-14N-8E Santa Fe	Pelto Oil Co. No. 1 Ortiz	—	7,450	Dakota (Cretaceous)	Temporarily D & A	Swabbed 15 bbls oil from Dakota. API gravity = 40 degrees
20	23-3S-21E De Baca	Mesa Petroleum Corp. No. 1 Devils Federal	8/81	3,800	Abo (Permian)	D & A	Tested noncommercial amounts of gas in Abo

activity. The objective of these wells is carbon dioxide from the Tubb sandstone (Permian); Roberts and others (1976) and Foster and Jensen (1972) discuss Tubb production. The carbon dioxide will be used in enhanced recovery operations. Approximately 140 carbon-dioxide wells were completed on the Bravo Dome in 1981. AMOCO is the leading operator in this area.

Elsewhere in northeast New Mexico, significant wildcats were drilled in 1981, but none were discoveries. Public Lands Exploration Company has drilled some shallow wildcats (less than 1,000 ft) into the Chinle redbeds (Triassic) in northern Guadalupe County. In the Raton Basin of Colfax County, the Pennzoil No. 1 Vermejo Ranch (fig. 1; table 2) encountered a 6-ft-high flare of gas in the Trinidad Sandstone (Cretaceous) (Speer, 1976; Ewing and Kues, 1976, p. xiv). The Pennzoil No. 2 Vermejo Ranch tested 691 MCFGPD from the Pierre Shale and is reported to be shut in. In the Hagan Basin of Santa Fe County, the Pelto Oil Company No. 1 Ortiz (fig. 1; table 2) swabbed 15 bbls of high-gravity crude oil from the Dakota Sandstone (Cretaceous). Other wells are being drilled to follow up on this first recovery of liquid hydrocarbons in Santa Fe County. Ingersoll and Kelley (1979) and Ingersoll and others (1979, p. x) summarized the Cretaceous stratigraphy of Santa Fe County. Also in northeast New Mexico, Shell Oil Company is continuing its exploration program in the Albuquerque Basin; the Shell No. 1-24 West Mesa Federal (sec. 24, T. 11 N., R. 1 E.) was spud in December 1980 and is reported to have reached a total depth of 19,286 ft.

Southwest New Mexico

Two wells have reportedly been drilled for oil and gas in southwest New Mexico in 1981. Both were drilled in Luna County by the Seville-Trident Corporation. The Seville-Trident No. 1 City of Deming, drilled to 4,225 ft in sec. 6, T. 24 S., R. 8 W., is reported to be shut in at a plugged-back depth of 3,651 ft. The Seville-Trident No. 1 McSherry, located in sec. 4, T. 24 S., R. 8 W., was drilling below 8,000 ft at the end of 1981, and is scheduled to drill to 12,000 ft to test the Paleozoic section. Although currently no production is taking place in southwest New Mexico, potential is present; several wells drilled in past years have encountered promising shows of both oil and gas (Thompson and others, 1978).

Effect of discoveries on oil and gas production

New Mexico's oil and gas production and reserves have been falling in recent years but the state still continues to be a major producer of both crude oil and natural gas (Arnold and Hill, 1981). In 1980, New Mexico was the seventh largest producer of crude oil and the fourth largest producer of natural gas in the United States (Arnold and Hill, 1981, p. 7). Production of crude oil in New Mexico in 1980 was 69.95 million bbls, a 6.3% decline from 1979; gas production was more than 1.1 trillion ft³, down 2.6% from 1979; and production of natural gas condensate in New Mexico rose 7% in 1980 to 5.4 million bbls (Arnold and Hill, 1981, p. 7). Data obtained from the New Mexico Oil Conservation Division indicate that similar declines in the production of oil and gas took place in 1981. The decline of production of the Empire-Abo oil field in northern Eddy County is the largest single reason for the overall decline of the state's oil production; production in that field has dropped 2 million to 3 million bbls a year since its peak was reached in 1976 and 1977 (Arnold and others, 1981b, p. 28–31). Smaller fields, however, also have recorded declining production. As of January 1, 1981, New Mexico has estimated reserves of 959 million bbls of oil and 17.7 trillion ft³ of natural gas (Arnold and others, 1981b, p. 40). This is a decrease of 55 million bbls of oil reserves and an increase of 4.3 trillion ft³ of gas reserves since December 31, 1979 (Arnold and others, 1981a, p. 19).

Production from the new fields discovered by the wells listed in table 1 will help slow the production decline in two ways. First, these new fields will be developed and the oil and gas obtained from them will partially replace waning production from older fields. Second, the discovery of these new fields will encourage the drilling of more wildcats, leading to the subsequent discovery of more fields.

The future of gas production in New Mexico is very promising. This is primarily because of the success of the Abo tight-sandstone play in north-central Chaves County. Gas reserves in the Abo have been estimated at as much as 3 trillion ft³ in Chaves and De Baca Counties (Wheatley, 1981); this is a major contribution to the gas reserves of New Mexico. If the field lives up to its full potential and economic conditions remain right for its developments, the state's decline in gas production would be slowed tremendously. The key to the development of this Abo play has been the tight-sand designation and the higher prices for which the Abo gas can be sold because of this designation, allowing for the production of otherwise unprofitable gas. Also, the deep gas discoveries in the Morrow Series in south-central Eddy County indicate that significant amounts of gas will still be produced from this unit; the Morrow produced gas prolifically during the 1960's and 1970's and continues to be a major contributor. The gas discovery by Bixco in the San Juan Basin suggests that large reserves of gas remain in the northwest part of the state.

The present decline of oil production in New Mexico will be lessened by the new oil found by the wildcat discoveries as well as by development drilling and enhanced recovery programs. The discovery of more oil in Mississippian and Pennsylvanian rocks on the Roosevelt uplift has shown that oil reserves exist north of the presently producing areas. The Bone Spring oil discoveries in Lea and Eddy Counties will lead to the development of oil fields south of the main producing areas. Extensive development drilling in 1981 in the San Juan Basin and on the Central Basin platform will partially stem the declining production in these areas in the immediate future. More enhanced-oil-recovery programs will be made possible by the carbon-dioxide production on the Bravo dome and will thus extend the lives of some of the older fields in the state, especially in the Permian Basin (Oil and Gas Journal, 1981).

For the more distant future, good promise to replace depleted reserves of the Permian and San Juan Basins exists in the frontier areas: the Raton, Hagan, and Albuquerque Basins and the Pedregosa Basin and adjacent parts of southwest New Mexico. All of these basins have the potential to be major hydrocarbon producers. Peak development of any of these areas that proves to be productive will probably not occur for several decades.

ACKNOWLEDGMENTS—I thank Robert A. Bieberman, Frank E. Kottlowski, and Sam Thompson III of the New Mexico Bureau of Mines and Mineral Resources for their discussions and critical reviews of the manuscript which greatly improved its quality. Richard Stamets of the New Mexico Oil Conservation Division provided the well-completion statistics.

References

Arnold, E. C., and Hill, J. M., compilers, 1981, New Mexico's energy resources '81: New Mexico Energy and Minerals Department, 62 p.

Arnold, E. C., Hill, J. M., and Donaldson, D. A., 1981a, Oil and gas, *in* New Mexico's energy resources '80, E. C. Arnold and J. M. Hill, eds.: New Mexico Bureau of Mines and Mineral Resources, Circ. 181, p. 10–21

Arnold, E. C., Hill, J. M., and Donaldson, D. A., 1981b, Oil and gas, *in* New Mexico's energy resources '81, E. C. Arnold and J. M. Hill, eds.: Energy and Minerals Department, Annual Report of the Bureau of Geology, p. 28–40

Ewing, R. C., and Kues, B. S., 1976, Guidebook of Vermejo Park, northeastern New Mexico: New Mexico Geological Society, Guidebook 27th field conference, 303 p.

Foster, R. W., and Jensen, J. G., 1972, Carbon dioxide in northeastern New Mexico: New Mexico Geological Society, Guidebook 23rd field conference, p. 192–200

Green, M. W., and Pierson, C. T., 1977, A summary of the stratigraphy and depositional environments of Jurassic and related rocks in the San Juan Basin, Arizona, Colorado, and New Mexico: New Mexico Geological Society, Guidebook 28th field conference, p. 147–152

Ingersoll, R. V., and Kelley, V. C., 1979, Stratigraphy and paleoenvironments of the Hagan Basin, north-central New Mexico: New Mexico Geological Society, Guidebook 30th field conference, p. 197–200

Ingersoll, R. V., Woodward, L. A., and James, H. L., eds., 1979, Guidebook of Santa Fe country: New Mexico Geological Society, Guidebook 30th field conference, 310 p.

(*continued on p. 32*)

Date and operation	Operators and owners	Location
11-13-81 coal	Operator—Burnham mine, Consolidation Coal Co., 3535 E. 30th St., Farmington, NM 87401; Gen. Mgr.: Mike Thurman, same address, phone: 327-6333 Property owner—Navajo Nation, Window Rock, AZ 86515	San Juan Co.; sec. 25, T. 25 N., R. 16 W. type: sub-bituminous; surface; private land belonging to the Navajo Nation; southwest of Farmington, NM, near Burnham Chapter house
11-23-81 coal	Operator—Arroyo No. 1 (ID 2901820), Energy Constructors, Inc., P.O. Box 30025, Sta. D, Albuquerque, NM 87110; Gen. Mgr.: Jack A. Lawrence, same address, phone: 247-1062; Person in charge: Dick Rowan (Energy Constructors), same address and phone; Gen. Supt.: Ed Murzyn, same address and phone Property owner—Page Mill Energy Corp., same address and phone	Sandoval Co.; sec. 16, T. 17 N., R. 2 W.; strip; state land; 42 mi out NM-44, turn left, back to town of San Luis
12-14-81 uranium	Operator—Northeast Churchrock, Teton Exploration Drilling Co., P.O. Drawer A-1, Casper, WY 82603; Gen. Mgr.: Victor Magnus, same address, phone: (307) 265-4102; Person in charge: Joe Pendergast, (DUR 2000) P.O. Box 2125, Milan, NM, phone: 287-4221; Gen. Supt.: Kerry Roe, P.O. Drawer A-1, Casper, WY, phone: (307) 265-4102 Property owner—United Nuclear Corp., P.O. Drawer QQ, Gallup, NM 87301	McKinley Co.; sec. 17, T. 16 N., R. 16 W.; Grants mining district; uranium; type—surface; works—vent hole; private land; from Grants, west on I-40 to McGaffey exit, service road west approx. 5 mi, turn right on CR hwy to end of road

(TO BE CONTINUED NEXT ISSUE)

Oil and gas wells drilled

(*continued from p. 19*)

Kinney, E. E., 1967, The oil and gas fields of southeastern New Mexico: Roswell Geological Society, 1967 symposium supplement, 195 p.

Meyer, R. F., 1966, Geology of Pennsylvanian and Wolfcampian rocks in southeast New Mexico: New Mexico Bureau of Mines and Mineral Resources, Mem. 17, 123 p.

Molenaar, C. M., 1977, Stratigraphy and depositional history of Upper Cretaceous rocks of the San Juan Basin area, New Mexico and Colorado, with a note on economic resources: New Mexico Geological Society, Guidebook 28th field conference, p. 159-166

Oil and Gas Journal, 1981, Permian Basin CO_2 targets pinpointed: Oil and Gas Journal, v. 79, no. 47, p. 185-186

Roberts, J. W., Barnes, J. J., and Wacker, H. J., 1976, Subsurface Paleozoic stratigraphy of the northeastern New Mexico basin and arch complex: New Mexico Geological Society, Guidebook 27th field conference, p. 141-152

Speer, W. R., 1976, Oil and gas exploration in the Raton Basin: New Mexico Geological Society, Guidebook 27th field conference, p. 217-226

Thompson, Sam, III, Tovar R., J. C., and Conley, J. N., 1978, Oil and gas exploration wells in the Pedregosa Basin: New Mexico Geological Society, Guidebook 29th field conference, p. 331-342

Wheatley, R., 1981, 'Tight' designation sparks Abo play: Oil and Gas Journal, v. 79, no. 25, p. 26-27 □

New USGS publication

Bulletin 1535. GEOLOGIC NAMES OF THE UNITED STATES THROUGH 1975, by R. W. Swanson, M. L. Hubert, G. W. Luttrell, and V. M. Jussen, 1981, 643 p. $9.00

This report lists most of the rock-stratigraphic names in published use in the United States through 1975 and the major elements necessary for their definition. The report was prepared primarily from U.S. Geological Survey lexicons published in 1938, 1957, 1966, 1970, and 1981, from library research, and from data in the files of the Survey's Geologic Names Committee. It also incorporates information supplied by State geologists.

The information is maintained in the computer of the U.S. Geological Survey in Reston (Virginia), Denver (Colorado), and Menlo Park (California). In the interests of usability the published list is necessarily selective. Informal names have been omitted until given formal status. Names used in charts, figures, map explanations, tables, abstracts, or in text without proper description must be considered informal.

Aeromagnetic maps

(*continued from p. 27*)

357 GP-357—Central part of San Miguel County, 1963

424 GP-424—Aeromagnetic and geologic map of part of the Silver City mining region, Grant County, New Mexico, by W. R. Jones, J. E. Case, and W. P. Pratt, scale 1:63,360, 1974

462 GP-462—Natural gamma aeroradioactivity of the Gnome (Carlsbad) area, New Mexico and Texas, by J. A. MacKallor, scale 1:250,000, 1964

838 GP-838—Aeromagnetic map of the Morenci-Monticello area, southeastern Arizona and southwestern New Mexico, scale 1:250,000, 1972

861 GP-861—Aeromagnetic map of the Carlsbad area, New Mexico and Texas, scale 1:250,000, 1973

Map inspection locations

1. U.S. Geological Survey Library, Rm. 4-A-100, 12201 Sunrise Valley Dr., Reston, VA 22092
2. U.S. Geological Survey Library, 1526 Cole Blvd. at W. Colfax Ave., Golden, CO (mail address: Stop 914, Box 25046, Federal Center, Denver, CO 80225)
3. U.S. Geological Survey Library, 345 Middlefield Rd., Menlo Park, CA 94025
4. P.I.O., Rm. 169, Federal Building, 1961 Stout St., Denver, CO 80294
5. P.I.O., Rm. 7638, Federal Building, 300 N. Los Angeles St., Los Angeles, CA 90012
6. P.I.O., Rm. 504, Custom House, 555 Battery St., San Francisco, CA 94111
7. P.I.O., Rm. 1C45, Federal Building, 1100 Commerce St., Dallas, TX 75242
8. P.I.O., Rm. 8105, Federal Building, 125 S. State St., Salt Lake City, UT 84138
9. U.S. Geological Survey, 505 Marquette, NW, Albuquerque, NM 87125
10. New Mexico Bureau of Mines and Mineral Resources, Campus Station, Socorro, NM 87801
11. Arizona Bureau of Geology and Mining Technology, 845 N. Park Ave., Tucson, AZ 85719
12. Nevada Bureau of Mines and Geology, University of Nevada, Reno, NV 89507 □

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