SOURCES OF INFORMATION AND DATA PERTAINING TO GEOHYDROLOGY IN THE VICINITY OF THE ROSWELL BASIN IN PARTS OF CHAVES, EDDY, DE BACA, GUADALUPE, LINCOLN, AND OTERO COUNTIES, NEW MEXICO

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
inch	25.40	millimeter
foot	0.3048	meter
mile	1.609	kilometer
acre	4,047	square meter
square mile	2.590	square kilometer
acre-foot	0.001233	cubic hectometer
foot per year	0.3048	meter per year
acre-foot per year	0.001233	cubic hectometer per year
cubic foot per second	0.02832	cubic meter per second
foot per day	0.3048	meter per day
foot squared per day	0.09290	meter squared per day
gallons per minute	0.06309	liter per second

$$°C = (°F - 32)/1.8$$

$$°F = (1.8 \times °C) + 32$$

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929--a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929.

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By Douglas P. McAda and Thomas D. Morrison

ABSTRACT

The Roswell ground-water basin, located in the Pecos River valley in southeast New Mexico, covers an area of 4,281 square miles. The New Mexico State Engineer Office is in the process of developing a ground-water flow model of the Roswell Basin to help manage the water resources of the basin and the Pecos River. This report identifies sources of information and presents summaries of data related to geohydrology in the vicinity of the Roswell Basin in support of that modeling effort. The types of information cited and summarized are published reports, aquifer hydraulic properties, climatic records, well and spring records, ground-water withdrawals, surface-water records, water-quality records, surface-water diversions, irrigated acreage, and crop types.

INTRODUCTION

The Roswell ground-water basin is located in the Pecos River valley in southeast New Mexico (fig. 1). The declared ground-water basin covers an area of 4,281 square miles (New Mexico State Engineer, 1966, p. iv). Ground water is the principal water-supply source in the Roswell Basin. Ground-water development in the basin began prior to 1900 (Fiedler and Nye, 1933, p. 189-191). Most of the ground water withdrawn from the basin is used for irrigated agriculture. In 1978, 378,000 acre-feet of ground water was withdrawn; 95 percent was for irrigation (Welder, 1983, p. 7).

The Roswell ground-water basin contains two aquifers separated by a confining unit (Welder, 1983, p. 4). The upper aquifer is primarily comprised of Cenozoic alluvium, but extends into the Seven Rivers Formation of the Permian Artesia Group at the southern end of the basin (Welder, 1983, p. 12-13). The confining unit is comprised of rocks of the Grayburg, Queen, and Seven Rivers Formations of the Artesia Group (Welder, 1983, p. 11). The lower aquifer is comprised of the Permian San Andres Limestone and the Grayburg and Queen Formations (Welder, 1983, p. 7). The lower aquifer is in hydraulic connection with the Permian Glorieta Sandstone and Yeso Formation to the west (Welder, 1983, p. 10). Although the aquifers discharge to the Pecos River, the major discharge is to wells.

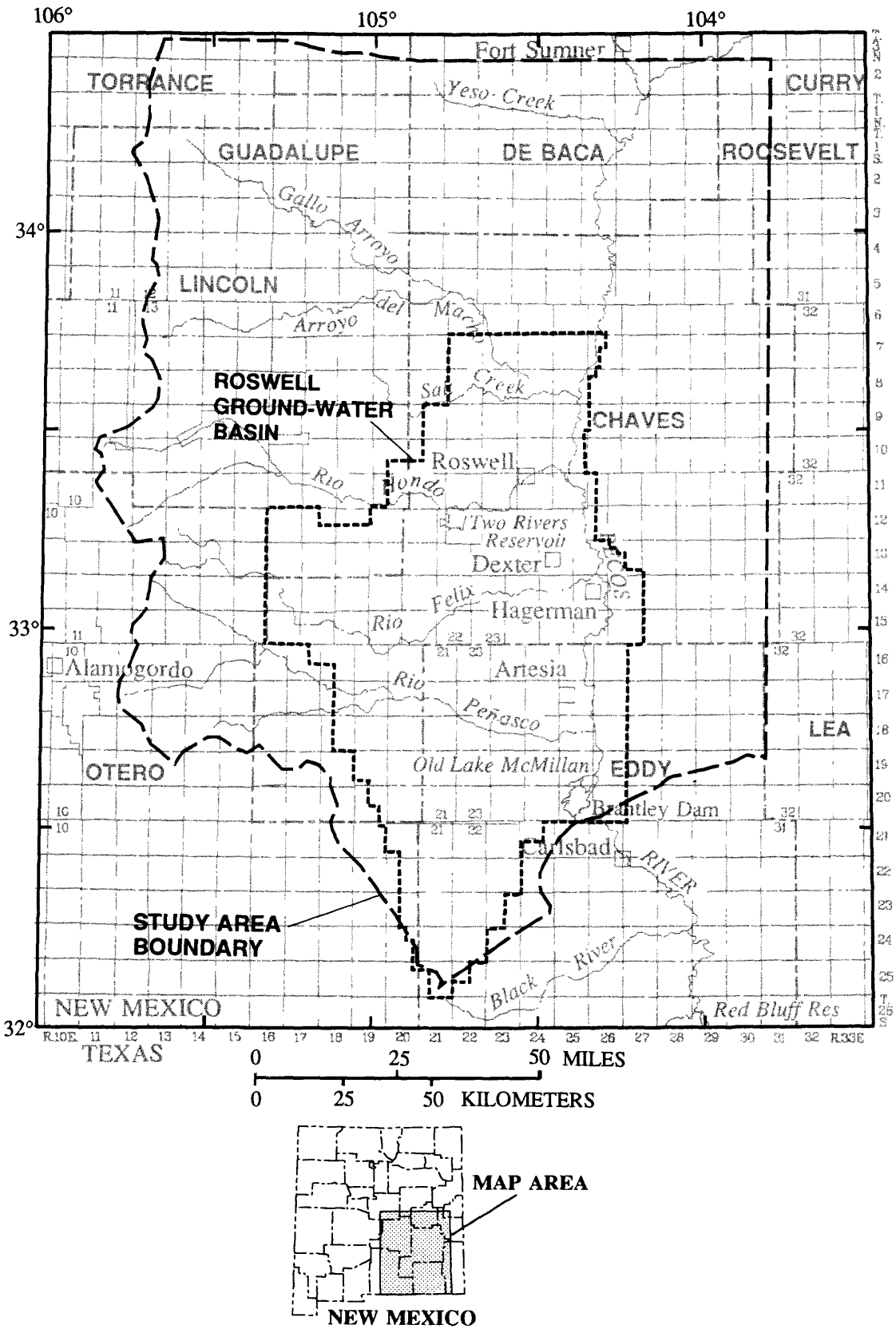


Figure 1.--Location of the study area.

Purpose and Scope

The New Mexico State Engineer Office is in the process of developing a ground-water flow model of the Roswell Basin to help manage the water resources of the basin and the Pecos River. The purpose of this report is to identify sources of information and summarize data pertaining to the geohydrology in the vicinity of the Roswell Basin in support of that modeling effort. The area included in this study is shown in figure 1. The study area extends beyond the boundary of the declared Roswell ground-water basin to include areas of possible influence on the basin.

Acknowledgments

This study was done in cooperation with the New Mexico State Engineer Office. The authors wish to thank Chris Adams and Renee Hasson, New Mexico State Engineer Office, for their work on the ground-water withdrawal data base. The authors also thank B. M. Garcia, R. A. Durall, and E. A. Benavidez, U.S. Geological Survey, for their work on the National Water Information System data base. Thanks are also extended to L. B. Pham, R. A. Durall, and D. J. Irwin, U.S. Geological Survey, for their work using Geographic Information Systems in support of this project.

SOURCES OF INFORMATION AND DATA PERTAINING TO GEOHYDROLOGY IN THE VICINITY OF THE ROSWELL BASIN

Many reports have been published on various aspects of geohydrology in the vicinity of the Roswell Basin. Table 1 contains a list of selected geohydrology-related reports, general descriptions of the study areas, and remarks on some of the information contained in those reports.

In addition to published reports, drillers' logs, lithologic logs, and geophysical logs from water wells are available in the offices of the U.S. Geological Survey in Albuquerque and the New Mexico State Engineer Office in Santa Fe. Geophysical logs, drill cuttings, and other information on oil and gas wells are available from the New Mexico Bureau of Mines and Mineral Resources in Socorro. Information about oil and gas wells may also be obtained from Petroleum Information Corporation, Denver, Colorado.[1]

Aquifer Hydraulic Properties

Hydraulic properties of the formations comprising the aquifers in the Roswell Basin from published reports are cited in tables 2-6. Transmissivity values of the alluvial aquifer, Artesia Group, San Andres Limestone, Glorieta Sandstone, and Yeso Formation are listed in table 2. Hydraulic-conductivity values of the alluvial aquifer are listed in table 3. Table 4 contains the storage coefficients of the Artesia Group, San Andres Limestone, and Yeso Formation. Specific-yield values of the alluvial aquifer are listed in table 5 and leakance values of the confining unit overlying the lower aquifer are listed in table 6.

[1]Use of firm names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

Table 1.--Sources of published information on geology and geohydrology in the vicinity of the Roswell Basin

[Reference: author(s), date of publication--complete citation in Selected References section]

Reference	Study area	Types of information
Akin, 1961	Near Roswell	Aquifer test data. Includes drillers' logs for six wells.
Bean, 1949	Roswell Basin	Geology. Emphasis on Hondo Reservoir.
Bjorklund and Motts, 1959	Carlsbad area	Geology and hydrology. Includes geologic and ground-water maps, scales 1:125,000 and 1:62,500; geologic sections.
Borton, 1972	Northwestern Chaves County	Geology. Includes top of Glorieta Sandstone map, approximate scale 1:290,000; lithologic logs for six selected wells.
Boyd, 1958	Central Guadalupe Mountains, southeastern Otero and southwestern Eddy Counties	Geology. Includes geologic map of El Paso Gap quadrangle, scale 1:62,500.
Bunte, 1960	Northwestern Roswell Basin	Geohydrology. Includes top of Glorieta Sandstone map, approximate scale 1:700,000; stratigraphic columns showing lithology for two wells.
Childers and Gross, 1985	Southwestern Roswell Basin	Geohydrology. Emphasis on Yeso Formation. Includes geologic sections and stratigraphic columns showing Glorieta Sandstone and Yeso Formation (includes identification of permeable zones).
Cox, 1957	Vicinity of Lake McMillan and Major Johnson Springs, Eddy County	Geohydrology. Includes records and lithologic logs of test wells.
Cox, 1967	Vicinity of Lake McMillan and Carlsbad, Eddy County	Geohydrology. Includes ground-water and geologic maps, scale 1:63,360; subcrop map; geologic section; miscellaneous streamflow measurements.
Cox and Havens, 1974	Between Artesia and Lake McMillan, Eddy County	Hydrology. Includes hydraulic-head maps, scale 1:125,000; density of phreatophytes maps, scale 1:62,500; Pecos River seepage investigations.
Crawford and Borton, 1961	Roswell Basin	Lithologic logs for 10 observation wells.

Table 1.--Sources of published information on geology and geohydrology in the vicinity of the Roswell Basin--Continued

Reference	Study area	Types of information
Crouch and Welder, 1988	Southern Roswell Basin	Geohydrology. Emphasis on effects of Brantley Reservoir.
Cushman, 1965	Vicinity of Lake McMillan and Major Johnson Springs, Eddy County	Geohydrology. Emphasis on Major Johnson Springs aquifer.
Dane and Bachman, 1958	Southeastern New Mexico	Geologic map, scale 1:380,160.
Dane and Bachman, 1965	New Mexico	Geologic map, scale 1:500,000.
Davis and others, 1980	Western Roswell Basin	Spring characteristics.
DeWilde, 1961	Vicinity of Flying H Ranch, southwestern Chaves County	Geohydrology. Includes records and drillers' logs of wells.
Dinwiddie and Clebsch, 1973	Guadalupe County	Hydrology. Includes geologic and hydrologic maps, approximate scale 1:170,000; top of Glorieta Sandstone map, approximate scale 1:660,000; records and water-quality analyses of wells and springs; lithologic and drillers' logs for 33 wells.
Duffy and others, 1978	Western Roswell Basin	Geohydrology. Study of recharge mechanisms.
Fiedler and Nye, 1933	Roswell Basin	Geohydrology. Includes geologic map, approximate scale 1:250,000; top of Picacho Limestone (San Andres Limestone) map, approximate scale 1:94,000; ground-water and irrigated-area maps; geologic sections; records of wells.
Fischer and Hackman, 1964	Torrance Station 4 NE quadrangle, northern Lincoln County	Geology. Includes geologic map, scale 1:24,000; geologic sections.
Fisher, 1906	Roswell Basin	Geohydrology. Includes reconnaissance geologic map, approximate scale 1:600,000; records of wells; drillers' logs for 17 wells.
Foster and others, 1972	East-central New Mexico	Geology. Includes thickness maps of the Bernal-Artesia Group, San Andres Limestone-Glorieta Sandstone, and Yeso Formation, approximate scale 1:1,400,000.

Table 1.--Sources of published information on geology and geohydrology in the vicinity of the Roswell Basin--Continued

Reference	Study area	Types of information
Griswold, 1959	Lincoln County	Geology. Includes geologic map, approximate scale 1:380,000.
Gross and others, 1976	Roswell Basin	Geohydrology. Use of environmental tritium in study of recharge.
Gross and others, 1979	Western Roswell Basin	Geohydrology. Recharge to Paul Spring and its applicability to the rest of the Roswell Basin. Includes geologic map, approximate scale 1:16,000; geologic sections.
Hantush, 1957	Roswell Basin	Geohydrology. Includes aquifer tests.
Hantush, 1961	Vicinity of Roswell, Chaves County	Aquifer tests.
Harbour, 1970	Includes western Roswell Basin, southwestern Lincoln and northeastern Otero Counties	Stratigraphy of Hondo and Glorieta Sandstones; includes stratigraphic sections.
Havenor, 1968	Northern Roswell Basin	Geology and hydrogeology. Includes top of San Andres Limestone map, top of Glorieta Sandstone map, scale 1:250,000; stratigraphic sections.
Hayes, 1959	Guadalupe Mountains, eastern Otero and southwestern Eddy Counties	Geology. Includes geologic map, scale 1:62,500; geologic sections showing stratigraphic columns.
Hayes, 1964	Last Chance Canyon and vicinity, southeastern Eddy County	Geology. Includes geologic map, scale 1:62,500; stratigraphic section.
Hayes and Koogle, 1958	Carlsbad Caverns West quadrangle, southeastern Eddy County	Geology. Includes geologic map, scale 1:62,500; geologic sections.
Hendrickson and Jones, 1952	Eddy County	Geohydrology. Includes geologic and ground-water maps, scales 1:250,000 and 1:125,000; records of wells, springs, and water-quality analyses.
Hiss, 1975	Vicinity of Capitan Reef, including part of Eddy County	Geohydrology of Capitan aquifer. Includes information on southern end of Roswell Basin.

Table 1.--Sources of published information on geology and geohydrology in the vicinity of the Roswell Basin--Continued

Reference	Study area	Types of information
Hood, 1963	Roswell Basin	Geohydrology. Includes maps showing chloride content of water in the San Andres Limestone, scales 1:125,000 and 1:63,400; ground-water-quality analyses.
Hood and others, 1960	Vicinity of Roswell, Chaves County	Geohydrology. Saline ground water. Includes ground-water and irrigated-area maps, approximate scale 1:130,000; records of surface- and ground-water-quality analyses.
Hoy and Gross, 1982	Roswell Basin	Geohydrology. Use of oxygen 18 and deuterium in study of recharge.
Kelley, 1971	Southeastern New Mexico	Geology. Includes geologic maps, approximate scale 1:190,000; tectonic map, approximate scale 1:250,000; geologic sections.
Kelley, 1972	Fort Sumner 1-degree by 2-degree quadrangle, De Baca, Guadalupe, Torrance, and Lincoln Counties	Geology. Includes geologic maps, approximate scale 1:190,000; top of Yeso Formation map, approximate scale 1:690,000.
Kinney and others, 1968	Roswell Basin	Geohydrology. Includes thickness of confining bed map, bottom of Glorieta Sandstone map, thickness of San Andres Limestone map, top of San Andres Limestone map, permeability of San Andres Limestone map, top of Queen Formation map, and ground-water maps, approximate scale 1:320,000; subcrop map, approximate scale 1:1,000,000; stratigraphic sections; geophysical logs.
Lloyd, 1949	Southeastern New Mexico	Geology. Includes stratigraphic sections and lithologic columns showing pre-San Andres rocks.
Lyford, 1973	Roswell Basin	Geohydrology. Includes base of valley fill map, thickness of valley fill map, saturated thickness of valley fill map, approximate scale 1:253,000; geologic sections.
Meinzer and others, 1927	Between Lake McMillan and Carlsbad, Eddy County	Geohydrology. Emphasis on a proposed reservoir site. Includes geologic map, scale 1:31,680; geologic sections; drillers' and lithologic logs for 13 test holes.

Table 1.--Sources of published information on geology and geohydrology in the vicinity of the Roswell Basin--Continued

Reference	Study area	Types of information
Morgan, 1938	Roswell Basin	Geohydrology of shallow aquifer. Includes thickness of valley fill map, approximate scale 1:256,000; map showing distribution of irrigation rights for shallow aquifer, approximate scale 1:210,000; records of wells.
Morgan, 1941	Roswell Basin and vicinity	Geology. Discussion of solutioning in the San Andres Limestone and Chalk Bluff Formation (Artesia Group); includes geologic section.
Morgan, 1942	Pecos River basin	Geology. Discussion of solutioning in the San Andres Limestone and Salado Formation; includes geologic sections.
Morgan and Sayre, 1942	Pecos River basin	Geology. Includes geologic section along Pecos River from Pecos, New Mexico, to Texas State line.
Motts, 1968	Guadalupian reef complex near Carlsbad, Eddy County	Geohydrology. Includes geologic map and hydraulic-head map, scale 1:250,000; generalized geologic section.
Motts and Cushman, 1964	Roswell Basin	Geohydrology. Includes geologic, ground-water, and relative aquifer-permeability maps, scale 1:500,000; geologic sections; records of wells and lithologic logs.
Mourant, 1963	Rio Hondo drainage, Chaves, Lincoln, and Otero Counties	Hydrology and geology. Includes geologic and hydraulic-head maps, approximate scale 1:127,000; geologic sections; records and chemical analyses of wells and springs; lithologic logs for 22 selected wells.
Mourant and Shomaker, 1970	De Baca County	Hydrology and geology. Includes geologic and ground-water maps, approximate scale 1:184,000; geologic sections; records and chemical analyses of wells and springs; stratigraphic logs for 48 wells.
Mower and others, 1964	Along Pecos River between Acme and Artesia, Chaves and Eddy Counties	Hydrology. Study of ground-water salvage; includes water-table contour maps, approximate scale 1:250,000; density of phreatophytes maps, approximate scale 1:32,000.
Rabinowitz and Gross, 1972	Roswell Basin	Geohydrology. Includes general geologic sections; map of transmissivity distribution, approximate scale 1:950,000.

Table 1.--Sources of published information on geology and geohydrology in the vicinity of the Roswell Basin--Concluded

Reference	Study area	Types of information
Rehfeldt and Gross, 1982	Roswell Basin	Geohydrology. Ground-water flow model of part of the Roswell Basin.
Renick, 1926	Rio Peñasco drainage, Chaves and Otero Counties	Geohydrology. Includes geologic sections; drillers' logs.
Saleem and Jacob, 1971a	Roswell Basin	Geohydrology. Includes hydraulic-head maps, approximate scale 1:375,000; aquifer hydraulic characteristics.
Sloan and Garber, 1971	Mescalero Apache Indian Reservation, Otero County	Geohydrology. Includes geologic and hydraulic-head maps, approximate scale 1:125,000; geologic section; records of wells.
Smith, 1957	Torrance County	Geohydrology. Includes geologic and ground-water maps, approximate scales 1:170,000, 1:190,000, 1:140,000; records of chemical analyses of wells and springs.
Summers, 1972b	Pecos River basin	Geohydrology. Includes permeability values from drill cores, water-table map, and geologic sections.
Theis, 1951	Roswell Basin	Geohydrology. Includes estimates of aquifer hydraulic characteristics.
Theis and others, 1942	Pecos River basin	Geohydrology. Discusses areas of the Pecos Valley, including the Roswell Basin.
Wasiolek, 1991	Upper Rio Hondo drainage and Mescalero Apache Indian Reservation, Lincoln and Otero Counties	Hydrogeology. Includes hydraulic-head map of Yeso Formation, approximate scale 1:400,000; records of wells; lithologic logs; aquifer-test results.
Welder, 1983	Roswell Basin	Geohydrology. Includes hydraulic-head maps, top of San Andres Limestone map, base of valley fill map, top of artesian aquifer map, thickness of confining bed map, saturated thickness of valley fill map, approximate scale 1:253,000; geologic sections.

Table 2.--Transmissivity of selected aquifers in the Roswell Basin

[Location: location number or descriptive location for which value of transmissivity pertains. See Supplemental Information for explanation of numbering system.
Method: brief description of how transmissivity was calculated.
Reference: published source of transmissivity value; complete citation in Selected References section]

Location	Transmissivity (feet squared per day)	Method	Reference
		Alluvial aquifer	
10S.24E.36.413	2,770	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
10S.25E.33.341	130	Aquifer test	Mower and others, 1964, p. 29
11S.24E.02.221	1,730	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
11S.24E.12.321	12,610	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
11S.24E.13.144	15,030	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
11S.24E.14.314	3,890	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
11S.24E.27.431	9,600	Aquifer test (drawdown)	Hantush, 1957, p. 24
11S.25E.06.332	2,850	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
11S.25E.06.332	1,900	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
11S.25E.16	2,070	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
11S.25E.25.114	780	Aquifer test	Mower and others, 1964, p. 29
11S.25E.25.144	1,600	Aquifer test	Mower and others, 1964, p. 29
11S.25E.34.113	7,950	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
11S.25E.34.311	1,810	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
11S.25E.36.142	1,700	Aquifer test	Mower and others, 1964, p. 29
11S.25E.36.143	1,600	Aquifer test	Mower and others, 1964, p. 29
11S.25E.36.242	3,100	Aquifer test	Mower and others, 1964, p. 29
12S.25E.23.234	5,000	Aquifer test (drawdown)	Hantush, 1957, p. 24
12S.25E.23.312	4,200	Aquifer test (drawdown)	Hantush, 1957, p. 24
12S.25E.23.312	5,300	Aquifer test (drawdown)	Hantush, 1957, p. 24
12S.25E.25.431	2,420	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
12S.25E.27.211	4,060	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
12S.26E.32.133	5,700	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
13S.25E.35.133	8,810	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
13S.25E.35.322	14,000	Aquifer test (drawdown)	Hantush, 1957, p. 24
13S.25E.35.322	13,000	Aquifer test (drawdown)	Hantush, 1957, p. 24
13S.26E.03.343	630	Aquifer test	Mower and others, 1964, p. 29
13S.26E.10.123	1,800	Aquifer test	Mower and others, 1964, p. 29
13S.26E.16.114	18,600	Aquifer test (drawdown)	Hantush, 1957, p. 24
13S.26E.16.114	13,000	Aquifer test (drawdown)	Hantush, 1957, p. 24
13S.26E.22.313	5,270	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
13S.26E.27.313	2,330	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158

Table 2.--Transmissivity of selected aquifers in the Roswell Basin--Continued

Location	Transmissivity (feet squared per day)	Method	Reference
		Alluvial aquifer	
13S.26E.28.221	4,580	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
13S.26E.28.311	3,630	Step-drawdown tests	Saleem and Jacob, 1971a, p. 158
14S.25E.13.311	12,180	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.03.433	23,140	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.06.142	9,420	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.06.211	39,140	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.08.342	1,900	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.08.433	6,570	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.09.221	6,220	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.10.133	181,440	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.14.113	3,110	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.17.233	15,210	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.17.444	286,850	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.18.211	18,490	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.18.324	6,390	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.20	26,780	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.23.230	5,360	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
14S.26E.25.331	830	Aquifer test	Mower and others, 1964, p. 29
14S.26E.26.423	2,700	Aquifer test	Mower and others, 1964, p. 29
14S.26E.26.424	2,900	Aquifer test	Mower and others, 1964, p. 29
15S.26E.10.112	21,770	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
15S.26E.20	8,290	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
15S.26E.27.211	1,400	Aquifer test	Mower and others, 1964, p. 29
15S.26E.29.321	184,030	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
15S.26E.29.344	9,760	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
15S.26E.32.344	10,970	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
16S.25E.06.223	15,380	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
16S.25E.25.211	2,510	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
16S.26E.19.411	5,010	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
16S.26E.29.331	4,750	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
16S.26E.32.213	3,460	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
16S.26E.32.311	3,020	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
17S.26E.02	5,440	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
17S.26E.08	10,540	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
17S.26E.17.333	11,660	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159

Table 2.--Transmissivity of selected aquifers in the Roswell Basin--Continued

Location	Transmissivity (feet squared per day)	Method	Reference
		Alluvial aquifer	
17S.26E.35.133	6,910	Step-drawdown tests	Saleem and Jacob, 1971a, p. 159
18S.26E.17.322	6,740	Step-drawdown tests	Saleem and Jacob, 1971a, p. 160
18S.26E.18.221	20,740	Step-drawdown tests	Saleem and Jacob, 1971a, p. 160
20S.26E.07.211	12,000	Aquifer test (drawdown)	Hantush, 1957, p. 24
20S.26E.07.423	69,210	Step-drawdown tests	Saleem and Jacob, 1971a, p. 160
20S.26E.08.112	3,540	Step-drawdown tests	Saleem and Jacob, 1971a, p. 160
20S.26E.08.122	13,000	Aquifer test (drawdown)	Hantush, 1957, p. 24
Bottom land adjacent to Pecos River	1,600	Average of 12 aquifer tests	Mower and others, 1964, p. 28
Outside of bottom land	13,600	Average of 30 aquifer tests	Mower and others, 1964, p. 29
Roswell Basin	6,600	Average estimated from 11 specific-capacity tests	Mower and others, 1964, p. 29
West of bottom land along Acme-Artesia reach of Pecos River	5,600	Based on hydraulic gradient and flow of water between cultivated and bottom land along river reach	Mower and others, 1964, p. 29-33
Roswell area, Chaves County	13,000	Average of aquifer tests	Hantush, 1957, p. 29
Dexter area, Chaves County	13,000	Average of aquifer tests	Hantush, 1957, p. 29
Artesia area, Eddy County	13,000	Average of aquifer tests	Hantush, 1957, p. 29
Lakewood area, Eddy County	13,000	Average of aquifer tests	Hantush, 1957, p. 29
Roswell Basin	13,000-20,000	Estimate based on comparison of specific capacities with those in other areas in New Mexico	Theis and others, 1942, p. 49
Roswell Basin	13,000	Estimate	William Hale, oral commun. (cited by Hantush, 1957, p. 7)
		Artesia Group	
08S.24E.35.224	3,970	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
08S.24E.35.343	60,310	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
09S.24E.02.414	62,900	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
09S.24E.02.421	15,810	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
09S.24E.11.133	49,940	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
10S.25E.31.413	10,200	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
10S.25E.32.423	1,600	Aquifer test (drawdown)	Hantush, 1961, p. 18
11S.24E.01.334	281,660	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
11S.24E.06.310	15,030	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
11S.24E.06.423	184,030	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
11S.24E.18.333	19,870	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161

Table 2.--Transmissivity of selected aquifers in the Roswell Basin--Continued

Location	Transmissivity (feet squared per day)	Method	Reference
		Artesia Group	
11S.24E.18.444	42,420	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
11S.25E.08.123	7,950	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
11S.25E.28.234	8,810	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
11S.25E.28.243	21,510	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
12S.25E.05.111	301,540	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
12S.25E.36.111	3,970	Step-drawdown tests	Saleem and Jacob, 1971b, p. 161
13S.24E.25.212	3,110	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
13S.25E.12	16,500	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
13S.25E.27.211	22,810	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
13S.25E.35.232	14,860	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
14S.24E.18.222	18,580	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
14S.25E.12.331	12,440	Step-drawdown tests	Saleem and Jacob, 1971a, p. 161
Major Johnson Springs area	6,700,000	Calculated estimate	Cushman, 1965, p. 37; Cox, 1967, p. 22
Major Johnson Springs area	5,900,000 - 7,500,000	Calculated estimates	Cushman, 1965, p. 34-35
		San Andres Limestone	
08S.24E.05.343	37,150	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
08S.24E.28.123	15,380	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
08S.24E.28.222	22,900	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
08S.24E.334.13	67,650	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
09S.24E.34	15,730	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.23E.24.143	53,400	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.23E.27.222	50,030	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.23E.34.432	14,430	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.09.333	189,000	Aquifer test (drawdown)	Hantush, 1957, p. 24
10S.24E.09.333	196,000	Aquifer test (recovery)	Hantush, 1957, p. 24
10S.24E.15.131	387,070	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.15.323	13,910	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.15.332	86,400	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.15.342	16,160	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.17.141	27,040	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.17.324	33,180	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.20.234	88,990	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.21.424	165,890	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.22.331	40,180	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.24E.22.343	101,950	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154

Table 2.--Transmissivity of selected aquifers in the Roswell Basin--Continued

Location	Transmissivity (feet squared per day)	Method	Reference
		San Andres Limestone	
10S.24E.27.421	11,410	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
10S.25E.33.441	253,000	Aquifer test (drawdown)	Hantush, 1961, p. 9
10S.25E.33.441	253,000	Aquifer test (recovery)	Hantush, 1961, p. 12
11E.23E.03.100	16,850	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
11S.23E.12.442	198,720	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
11S.23E.12.444	43,720	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
11S.23E.13.232	38,790	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
11S.23E.28.223	97,200	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
Hondo Reservoir area (vicinity of present Two Rivers Reservoir)	400,000	Quantitative estimate	Theis, 1951, p. 34
Roswell area, Chaves County	190,000	Average of aquifer tests	Hantush, 1957, p. 29
Dexter area, Chaves County	10,000	Average of aquifer tests	Hantush, 1957, p. 29
Artesia area, Eddy County	20,000	Average of aquifer tests	Hantush, 1957, p. 29
Western Roswell Basin intake area[1]	10,000	Quantitative estimate	Hantush, 1957, p. 28-29
Western Roswell Basin intake area[1]	8,700	Optimization using nonlinear programming	Saleem and Jacob, 1971a, p. 27
In vicinity of Rio Hondo near Picacho[2]	2,300	Parameter estimation and assumed storage coefficient of 0.10	Duffy and others, 1978, p. 52
Lakewood area, Eddy County	8,800	Average of aquifer tests	Hantush, 1957, p. 29
11S.24E.01.313	13,310	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
11S.24E.04.114	224,640	Step-drawdown tests	Saleem and Jacob, 1971a, p. 154
11S.24E.06.310	15,120	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.08.124	410,400	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.08.124	15,730	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.11.243	68,260	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.12.113	669,600	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.12.231	64,890	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.13.233	18,580	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.14.213	35,860	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.14.324	639,630	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.14.343	27,300	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.15.431	10,540	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.18.242	98,500	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.18.333	19,530	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155

Table 2.–Transmissivity of selected aquifers in the Roswell Basin--Continued

Location	Transmissivity (feet squared per day)	Method	Reference
		San Andres Limestone	
11S.24E.19	20,910	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.20.313	101,090	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.26.433	55,300	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.26.433	194,000	Aquifer test (drawdown)	Hantush, 1957, p. 24
11S.24E.28	21,600	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.28.313	7,600	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.24E.36.211	16,680	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.25E.14.332	100,000	Analytical methods	Summers, 1972a, p. 23
11S.25E.29.333	17,110	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
11S.25E.32.133	65,840	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
12S.23E.01.413	71,110	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
12S.23E.06.214	21,080	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
[3]12S.24E.	200,000	Estimated from pump-test data	Mervin L. King, oral commun., Jan. 1967 (cited by Havenor, 1968, p. 13)
12S.24E.21.333	37,410	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
12S.25E.13.111	204,770	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
12S.25E.35.131	444,960	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
12S.26E.33.333	[4]7,800	Analytical methods	Average of values reported by Summers, 1972a, p. 23
13S.25E.13.133	16,240	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
13S.25E.23.311	10,000	Aquifer test (drawdown)	Hantush, 1957, p. 24
13S.25E.24.333	232,420	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
13S.25E.26.411	60,740	Step-drawdown tests	Saleem and Jacob, 1971a, p. 155
13S.26E.03.144	3,100	Analytical methods	Average of values reported by Summers, 1972a, p. 23
13S.26E.06.331	14,600	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
13S.26E.30.213	59,530	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
13S.26E.31.211	24,620	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
13S.26E.31.214	387,070	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
14S.25E.14.3111	9,800	Analytical methods	Average of values reported by Summers, 1972a, p. 23
14S.26E.09.313	24,360	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
14S.26E.32.124	40,780	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
15S.25E.23.122	18,000	Analytical methods	Average of values reported by Summers, 1972a, p. 23
15S.25E.24.212	5,100	Analytical methods	Average of values reported by Summers, 1972a, p. 23
15S.25E.33.333	44,600	Analytical methods	Average of values reported by Summers, 1972a, p. 23

Table 2.--Transmissivity of selected aquifers in the Roswell Basin--Continued

Location	Transmissivity (feet squared per day)	Method	Reference
		San Andres Limestone	
15S.25E.35.213	22,210	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
15S.25E.35.311	9,070	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
15S.26E.04.123	55,120	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
15S.26E.13.222	691,200	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
16S.24E.02.324	95,900	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
16S.25E.07.111	62,900	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
16S.26E.20.433	18,920	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
16S.26E.20.433	15,030	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
17S.26E.08.431	12,530	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
17S.26E.08.431	44,240	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
17S.26E.08.444	14,430	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
17S.26E.09.113	22,290	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
17S.26E.17.233	9,940	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
17S.26E.17.233	10,710	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
17S.26E.20.431	28,340	Step-drawdown tests	Saleem and Jacob, 1971a, p. 156
17S.26E.32.133	29,380	Step-drawdown tests	Saleem and Jacob, 1971a, p. 157
17S.26E.32.213	28,600	Step-drawdown tests	Saleem and Jacob, 1971a, p. 157
18S.26E.10.313	72,580	Step-drawdown tests	Saleem and Jacob, 1971a, p. 157
18S.26E.34	17,630	Step-drawdown tests	Saleem and Jacob, 1971a, p. 157
18S.26E.34	21,170	Step-drawdown tests	Saleem and Jacob, 1971a, p. 157
19S.26E.27.221	2,680	Step-drawdown tests	Saleem and Jacob, 1971a, p. 157
20S.26E.06.431	8,800	Aquifer test (drawdown)	Hantush, 1957, p. 24
20S.26E.06.431	7,500	Aquifer test (recovery)	Hantush, 1957, p. 24
Roswell area[5]	190,000	Estimated average	Havenor, 1968, p. 15
Roswell Basin	40,000	Estimated average	Kinney and others, 1968, p. 19
Roswell Basin	Transmissivity map	Based on aquifer tests and specific-capacity tests	Kinney and others, 1968, figure 11
Roswell Basin	Transmissivity map	Based on aquifer tests	Rabinowitz and Gross, 1972, figure 2.3, p. 24
		Glorieta Sandstone and Yeso Formation	
Western Roswell Basin (intake area). Area west of confined San Andres aquifer and south of T. 9 S. (includes San Andres Limestone, Glorieta Sandstone, and Yeso Formation)	10,000	Quantitative estimate	Hantush, 1957, p. 28-29

Table 2.--Transmissivity of selected aquifers in the Roswell Basin--Concluded

Location	Transmissivity (feet squared per day)	Method	Reference
		Glorieta Sandstone and Yeso Formation	
Western Roswell Basin (intake area). Area west of confined San Andres aquifer and south of T. 9 S. (includes San Andres Limestone, Glorieta Sandstone, and Yeso Formation)	8,700	Optimization using nonlinear programming	Saleem and Jacob, 1971a, p. 27
In vicinity of Rio Hondo near Picacho	2,300	Parameter estimation and assumed storage coefficient of 0.10	Duffy and others, 1978, p. 52
		Yeso Formation	
12S.15E.35.334	3.5-19	Aquifer test	Wasiolek, 1991, p. 346
13S.16E.10.324	560	Aquifer test	Wasiolek, 1991, p. 346
14S.15E.11.333	960	Aquifer test	Wasiolek, 1991, p. 346
15S.14E.04.412	454	Aquifer test	Wasiolek, 1991, p. 346
Mescalero Apache Indian Reservation	18-5,900 Average 1,350	Calculated from specific-capacity tests	Wasiolek, 1991, p. 346

[1]Principal intake area defined by Fiedler and Nye, 1933, plate 2 (unconfined part of aquifer).
[2]Unconfined Glorieta Sandstone and Yeso Formation.
[3]Grayburg Formation and San Andres Limestone.
[4]Values ranged from 4,500 to 11,000 feet squared per day--high value of 30,000 not included in average.
[5]Average between Six Mile and Y-O structural zones (see Havenor, 1968, plate 1).

Table 3.--Hydraulic conductivity of the alluvial aquifer in the Roswell Basin

[Location: location number or descriptive location for which value of hydraulic conductivity pertains. See Supplemental Information for explanation of numbering system. Hydraulic conductivity: from Mower and others, 1964, p. 29-33. Method: brief description of how hydraulic conductivity was calculated]

Location	Hydraulic conductivity (feet per day)	Method
10S.25E.33.341	3	Aquifer test
11S.25E.25.114	20	Aquifer test
11S.25E.25.144	43	Aquifer test
11S.25E.36.142	56	Aquifer test
11S.25E.36.143	55	Aquifer test
11S.25E.36.242	48	Aquifer test
13S.26E.3.343	63	Aquifer test
13S.26E.10.123	197	Aquifer test
14S.26E.25.331	44	Aquifer test
14S.26E.26.423	114	Aquifer test
14S.26E.26.424	94	Aquifer test
15S.26E.27.211	79	Aquifer test
Bottom land adjacent to Pecos River	55	Average of 12 aquifer tests
Outside of bottom land	114	Average of 30 aquifer tests
Roswell Basin	65	Average estimated from 11 specific-capacity tests
West of bottom land along Acme-Artesia reach of Pecos River	59	Based on hydraulic gradient and flow of water between cultivated and bottom land along river reach

Table 4.--Storage coefficient of selected aquifers in the Roswell Basin

[Location: location number or descriptive location for which value of storage coefficient pertains. See Supplemental Information for explanation of numbering system. Method: brief description of how storage coefficient was calculated. Reference: published source of storage-coefficient value; complete citation in Selected References section]

Location	Storage coefficient (dimensionless)	Method	Reference
		Artesia Group	
10S.25E.32.423	0.0000565	Aquifer test (drawdown)	Hantush, 1961, p. 18
Major Johnson Springs aquifer, Eddy County (portion of aquifer between 3,207 and 3,216 feet in altitude)	0.17	Estimated from inflow, outflow, and changes in hydraulic head	Cushman, 1965, p. 32-33, 37
		San Andres Limestone	
10S.24E.9.333	0.000015	Aquifer test (drawdown)	Hantush, 1957, p. 24
10S.24E.9.333	0.000018	Aquifer test (recovery)	Hantush, 1957, p. 24
10S.25E.33.441	0.000067	Aquifer test (recovery)	Hantush, 1961, p. 13
11S.24E.26.433	0.0000084	Aquifer test (drawdown)	Hantush, 1957, p. 24
13S.25E.23.311	0.000013	Aquifer test (drawdown)	Hantush, 1957, p. 24
20S.26E.6.431	0.00011	Aquifer test (drawdown)	Hantush, 1957, p. 24
Roswell area, Chaves County	0.00001	Average of aquifer tests	Hantush, 1957, p. 29
Dexter area, Chaves County	0.00005	Average of aquifer tests	Hantush, 1957, p. 29
Artesia area, Eddy County	0.00005	Average of aquifer tests	Hantush, 1957, p. 29
Lakewood area, Eddy County	0.00010	Average of aquifer tests	Hantush, 1957, p. 29
Area of confined aquifer	0.000055	Quantitative estimate	Hantush, 1961, p. 4-5
Western Roswell Basin (intake area[1])	Less than 0.01	Estimate	Hantush, 1957, p. 28-29
Western Roswell Basin (intake area[1])	0.025	Optimization using nonlinear programming	Saleem and Jacob, 1971a, p. 27
Hondo Reservoir area (vicinity of present Three Rivers Reservoir), unconfined portion of aquifer	0.05	Quantitative estimate	Theis, 1951, p. 34
		Yeso Formation	
12S.15E.35.334	0.00085	Aquifer test	Wasiolek, 1991, p. 346

[1]Principal intake area defined by Fiedler and Nye, 1933, plate 2 (unconfined part of aquifer).

Table 5.--Specific yield of the alluvial aquifer in the Roswell Basin

[Location: location number or descriptive location for which value of specific yield pertains. See Supplemental Information for explanation of numbering system.
Method: brief description of how specific yield was calculated.
Reference: published source of specific-yield value; complete citation in Selected References section]

Location	Specific yield (dimensionless)	Method	Reference
Roswell Basin	0.1	Rough estimate	Theis and others, 1942, p. 49
12S.25E.23.312	0.0555	Aquifer test	Hantush, 1957, p. 24
13S.26E.16.114	0.0228	Aquifer test	Hantush, 1957, p. 24
13S.25E.35.322	0.0384	Aquifer test	Hantush, 1957, p. 24
Roswell area, Chaves County	[1]0.10	Average value	Hantush, 1957, p. 29
Dexter area, Chaves County	[1]0.10	Average value	Hantush, 1957, p. 29
Artesia area, Eddy County	[1]0.10	Average value	Hantush, 1957, p. 29
Lakewood area, Eddy County	[1]0.10	Average value	Hantush, 1957, p. 29

[1]Ultimate average specific yield for these areas is estimated by Hantush (1957, p. 29) to be about 0.20.

Table 6.--Leakance of the confining unit overlying the lower aquifer in the Roswell Basin

[Location: location number or descriptive location for which value of leakance pertains. See Supplemental Information for explanation of numbering system.
Method: brief description of how leakance was calculated.
Reference: published source of leakance value; complete citation in Selected References section]

Location	Leakance (per day)	Method	Reference
10S.24E.9.333	0.00028	Aquifer test (drawdown)	Hantush, 1957, p. 24
10S.24E.9.333	0.00029	Aquifer test (recovery)	Hantush, 1957, p. 24
[1]10S.25E.32.423	0.00019	Aquifer test (drawdown)	Hantush, 1961, p. 19
10S.25E 33.441	0.00020	Aquifer test (drawdown)	Hantush, 1961, p. 9
10S.25E.33.441	0.00015	Aquifer test (recovery)	Hantush, 1961, p. 12
11S.24E.26.433	0.00010	Aquifer test (drawdown)	Hantush, 1957, p. 24
13S.25E.23.311	0.0000087	Aquifer test (drawdown)	Hantush, 1957, p. 24
20S.26E.6.431	0.000013	Aquifer test (drawdown)	Hantush, 1957, p. 24
Roswell area, Chaves County	0.000152	Average of aquifer tests	Hantush, 1957, p. 29
Dexter area, Chaves County	0.0000082	Average of aquifer tests	Hantush, 1957, p. 29
Artesia area, Eddy County	0.000032	Average of aquifer tests	Hantush, 1957, p. 29
Lakewood area, Eddy County	0.000013	Average of aquifer tests	Hantush, 1957, p. 29

[1]Well completed in Artesia Group.

Climatic Records

A summary of climatic stations where monthly temperature, precipitation, and evaporation data have been collected in the vicinity of the Roswell Basin is given in table 7. The locations of those stations are shown in figure 2. Data prior to 1955 are available in New Mexico State Engineer publications (1956a, 1956b). More recent data are available from the U.S. Department of Commerce (1948-89). Monthly and annual means for selected stations are listed in Gabin and Lesperance (1977) and Kunkel (1984).

The National Climatic Data Center in Asheville, North Carolina, maintains a computer data file of monthly climatic data (U.S. Department of Commerce, 1990). This computer file contains data from 1948 to the present (1991) (some stations may include 1931 to the present). Earlier data are available but not in digital form.

Well and Spring Records

Records of wells, including water-level depths and formations in which wells are completed, are maintained by the U.S. Geological Survey in the National Water Information System (NWIS) data base (Mathey, 1989). At present (1991), this computerized data base contains records from 4,661 wells within the study area. The locations of these wells are shown in figure 3. Well records are also published in several reports. These reports are listed in table 1. Additional well records are available from the files of the New Mexico State Engineer Office in Santa Fe.

Records of springs in the vicinity of the Roswell Basin are listed in table 8. Records of many of those springs are also available from the NWIS data base (Mathey, 1989). Locations of those springs included in the data base are shown in figure 4.

Table 7.--Period of record for monthly summary of temperature, precipitation, and evaporation data for selected stations in the vicinity of the Roswell Basin

EXPLANATION

Station name: Current station name, or if station is discontinued, last station name. Names in parentheses are previous names for the station. The abbreviation (Nr.) indicates the station was near the community given as the station name.

Index number: Number assigned to station by National Oceanic and Atmospheric Administration. If a previous name for the station had a different index number, that number is given in parentheses along with the previous station name. Stations that have no index number are shown with letter designations for identification in figure 2.

Latitude-Longitude: Current or last location of the station, in degrees and minutes north latitude followed by degrees and minutes west longitude.

Altitude: Current or last altitude of the station, in feet above sea level.

Period of record: Years in which data were collected at the station for temperature, precipitation, and evaporation. Years in which summary data are available for at least 1 month are included. Years followed by a dash indicate the station was in operation from that year through at least 1989. -- indicates no data.

Information in this table was compiled from the National Climatic Data Center Summary of the Month digital file (U.S. Department of Commerce, 1990), monthly and annual summaries of climatological data for New Mexico (U.S. Department of Commerce, 1948-89), and New Mexico State Engineer Office climatological summary reports (New Mexico State Engineer Office, 1956a and 1956b).

Station name	Index number	County	Latitude-Longitude		Altitude (feet)	Period of record		
						Temperature	Precipitation	Evaporation
Alto	A	Lincoln	33 24	105 41	7,400	1896-97	1896-97;1905-9	--
Ancho	0394	Lincoln	33 56	105 45	6,112	1956-71	1909-71	--
Arabella (Nr.)	B	Lincoln	33 38	105 10	6,360	1902-5	1916-22;1930-45	--
Artesia 6 S (Artesia)	0600	Eddy	32 46	104 23	3,320	1905-7;1910-	1905-7;1910-	--
Baca Ranger Station	C	Lincoln	33 32	105 22	6,500	--	1916-29	--
Bitter Lakes Wildlife Refuge	0992	Chaves	33 28	104 24	3,664	1950-	1950-	1951-75;1977-
Block Ranger Station	D	Lincoln	33 41	105 23	6,000	--	1916-18	--
Bonito Dam	1120	Lincoln	33 27	105 45	7,500	--	1944-54	--
Brantley Dam	1153	Eddy	32 31	104 23	3,213	1987-	1987-	1987-
Buchanan	E	De Baca	34 27	104 50	5,245	--	1915-24;1940	--
Canton	1423	De Baca	34 17	104 10	4,056	--	1940-	--
Capitan	1440	Lincoln	33 33	105 35	6,477	1923-25;1927-43; 1976-	1909-42;1945-66; 1976-	--
Carlsbad	1469	Eddy	32 25	104 14	3,120	1889;1891;1894-	1889;1891;1894-	--

Table 7.--Period of record for monthly summary of temperature, precipitation, and evaporation data for selected stations in the vicinity of the Roswell Basin--Continued

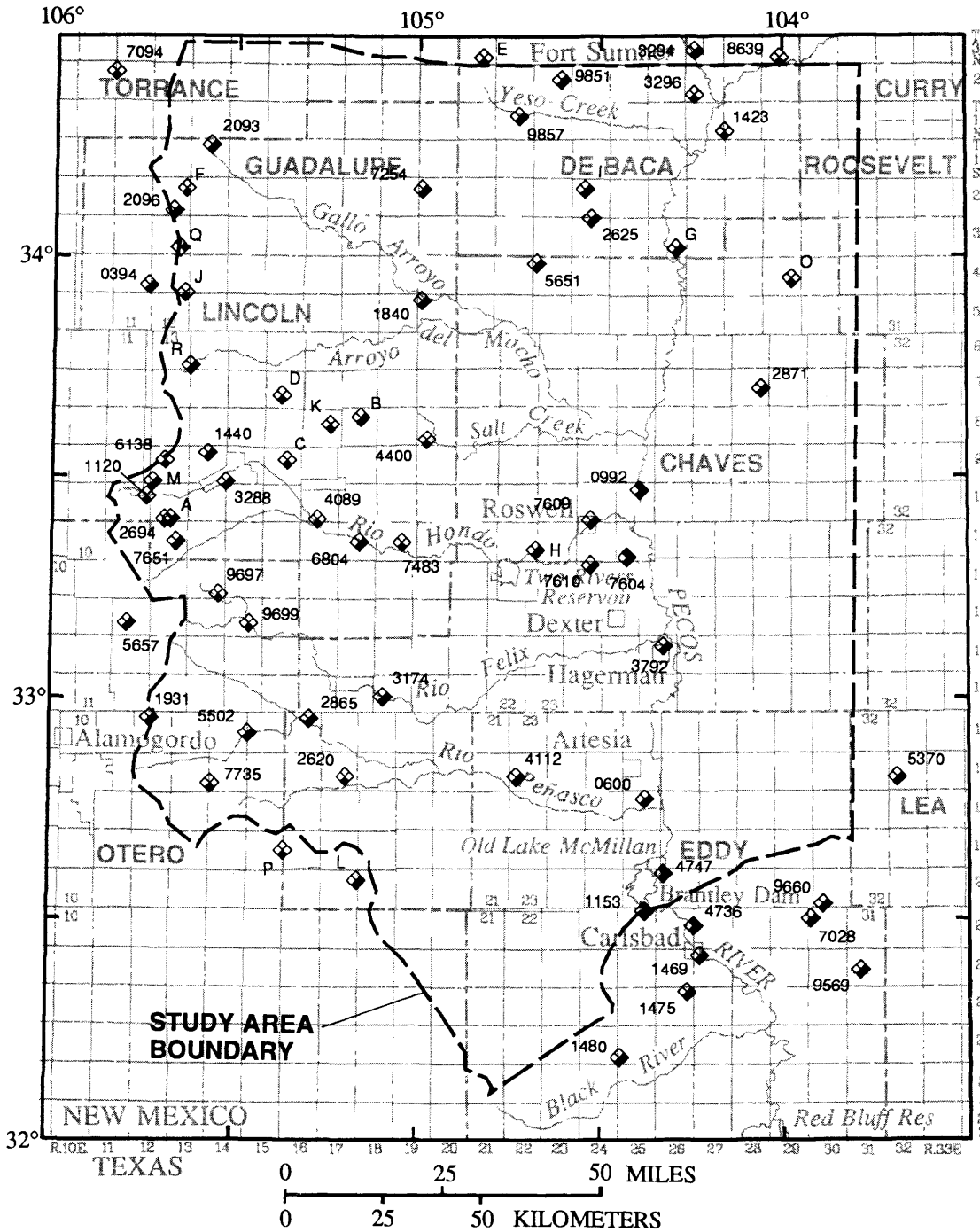
Station name	Index number	County	Latitude	Longitude	Altitude (feet)	Period of record: Temperature	Period of record: Precipitation	Period of record: Evaporation
Carlsbad FAA Airport (Carlsbad CAA Airport)	1475	Eddy	32 20	104 16	3,235	1942-43;1948-	1942-43;1948-	--
Carlsbad Caverns	1480	Eddy	32 11	104 27	4,406	1930-	1930-	--
Circle F Ranch (Farnsworth Ranch, 3145)	1840	Lincoln	33 54	105 00	5,400	1962-	1940-	--
Cloudcroft (Cloudcroft Cable TV, 1927; Cloudcroft, 1927; Cloud Country Lodge, 1933; Cloudcroft Lodge, 1927; Cloudcroft Ranger Station, 1927; Cloudcroft #1, 1927)	1931	Otero	32 57	105 44	8,661	1901-	1902-	--
Corona	2093	Lincoln	34 15	105 35	6,645	1912-77	1909-76	--
Corona 11 SSW	2096	Lincoln	34 06	105 41	6,503	1977-	1977-	--
Dunken	2620	Chaves	32 49	105 12	5,452	--	1946-48	--
Dunlap	2625	De Baca	34 05	104 32	4,050	1953-61	1940-51;1953-61	--
Eagle Creek Intake	2694	Lincoln	33 24	105 42	8,000	--	1944-49	
Elk 2 E (Elk 3 E, Elk, Lower Peñasco, Elk Nr.)	2865	Chaves	32 57	105 18	5,729	1895-1902; 1904-10;1922-	1895-1902; 1904-10;1922-	--
Elkins (Boaz)	2871	Chaves	33 42	104 04	4,030	1909-48	1909-48	--
Felix	3174	Chaves	33 00	105 06	5,300	1917-19	1929;1931-64	--
Fort Stanton	3288	Lincoln	33 29	105 32	6,220	1855-61;1866-72; 1881-82;1885-93; 1896-97;1900-41; 1943-74	1856-61;1868-72; 1881-96;1900-41; 1943-74	--
Fort Sumner	3294	De Baca	34 28	104 15	4,026	1908-	1864-69;1908-	--
Fort Sumner 5 S (Fort Sumner 4 S, Fort Sumner Nr.)	3296	De Baca	34 22	104 15	4,052	--	1941;1946-	--
Gallinas Ranger Station	F	Lincoln	3409	105 39	6,636	--	1909-46	--
Glen	G	De Baca	34 01	104 18	3,493	1906-7	1906-8	--
Hagerman	3792	Chaves	33 07	104 20	3,419	1920-24;1931-60	1920-24;1931-60	--
Hondo (Hondo Ranger Station)	4089	Lincoln	33 24	105 17	3,510	--	1943-54	--

Table 7.--Period of record for monthly summary of temperature, precipitation, and evaporation data for selected stations in the vicinity of the Roswell Basin--Continued

Station name	Index number	County	Latitude	Longitude	Altitude (feet)	Period of record: Temperature	Precipitation	Evaporation
Hondo Reservoir	H	Chaves	33 20	104 41	3,904	1909-17	1908-18	--
Hope	4112	Eddy	32 49	104 44	4,100	1920-46;1966-	1919-46;1966-	--
Ingleville (Skipworth Ranch)	I	De Baca	34 09	104 33	4,600	1917	1915-18;1942-47	--
Jicarilla	J	Lincoln	33 55	105 39	6,800	--	1925-29	--
Jones Ranch	4400	Chaves	33 35	104 59	4,900	--	1940-45;1947-49	--
Lake Avalon	4736	Eddy	32 29	104 15	3,208	1951-79	1914-79	1917-30; 1951-78
Lake McMillan	4747	Eddy	32 36	104 20	3,280	1940-49	1940-49	1940-49
Maljamar 4 SE (Maljamar)	5370	Lea	32 49	103 42	4,000	1942-	1942-	--
Mayhill Ranger Station	5502	Otero	32 55	105 28	6,558	1939;1941-76	1917-76	--
Meek	K	Lincoln	33 37	105 15	6,380	--	1916-22	--
Mesa Service Station	5651	Chaves	33 59	104 41	5,000	1938-53	1938-53	--
Mescalero	5657	Otero	33 10	105 48	6,785	1911-16;1918-78	1911-16;1918-78	--
Miller-Thorne Ranch	L	Chaves	32 35	105 10	5,225	1923-26	1922-26	--
Nogal (Nr.) (Loma Grande)	M	Lincoln	33 29	105 44	8,200	1920-25	1913-25	--
Nogal Lake	6138	Lincoln	33 32	105 42	7,180	--	1944-54	--
Olive	O	Chaves	33 57	103 59	4,100	--	1909-13;1920-27 1929	--
Picacho 2 WSW (Picacho, 6803)	6804	Lincoln	33 21	105 10	5,042	1951-78;1980-	1951-	--
Piñon (Nr.)	P	Otero	32 39	105 22	6,058	--	1916-23	--
Potash mine	7028	Eddy	32 30	103 56	3,320	1954-68	1954-68	--
Progresso	7094	Torrance	34 25	105 51	6,300	--	1929-	--
Ramon 8 SW	7254	Lincoln	34 09	105 00	5,327	1957-61;1963-	1957-61;1963-	--
Riverside Camp	7483	Lincoln	33 21	105 03	4,763	--	1939-48	--
Roswell (Roswell #2)	7604	Chaves	33 19	104 26	3,571	1918-22;1940-49	1918-22;1940-49	1940-50
Roswell WB Airport	7609	Chaves	33 24	104 32	3,636	1893-1972	1878-1972	--
Roswell FAA Airport	7610	Chaves	33 18	104 32	3,669	1972-	1972-	--

Table 7.--Period of record for monthly summary of temperature, precipitation, and evaporation data for selected stations in the vicinity of the Roswell Basin--Concluded

Station name	Index number	County	Latitude	Longitude	Altitude (feet)	Period of record		
						Temperature	Precipitation	Evaporation
Ruidoso 2 (Ruidoso 2 NNE, 7649; Ruidoso)	7651	Lincoln	33 21	105 40	6,937	1942-	1942-	--
Sacramento (Weed R.S.)	7735	Otero	32 48	105 34	7,300	--	1916-30;1945-54	--
Taiban	8639	De Baca	34 27	104 01	4,130	--	1942-77	--
Tecolote	Q	Lincoln	34 01	105 40	6,539	1912-19	--	--
Waste Isolation Pilot Plant	9569	Eddy	32 23	103 48	3,418	1986-	1986-	--
Western AG Minerals (Duval Potash Mine, 2677)	9660	Eddy	32 32	103 54	3,520	1968-	1968-	--
White Oaks (Nr.) (Patos)	R	Lincoln	33 45	105 38	7,000	1896-1901	1896-1901;1905-6 1920-24	--
White Tail	9697	Otero	33 14	105 33	7,600	--	1914-48;1954-59	--
White Tail 6 SE	9699	Otero	33 10	105 28	7,040	--	1955	--
Yeso 2 S	9851	De Baca	34 24	104 37	4,850	1960-	1941-	--
Yeso Overton Ranch	9857	De Baca	34 19	104 44	5,000	1949-59	1943;1945-59	--



EXPLANATION

1480 ◈ WEATHER STATION AND INDEX--Index number or letter identifies the station listed in table 7. Symbol indicates the type of data collected:

- ◈ Temperature only
- ◈ Precipitation only
- ◈ Temperature and precipitation
- ◈ Temperature, precipitation, and evaporation

Figure 2.--Climatic stations in the vicinity of the Roswell Basin.

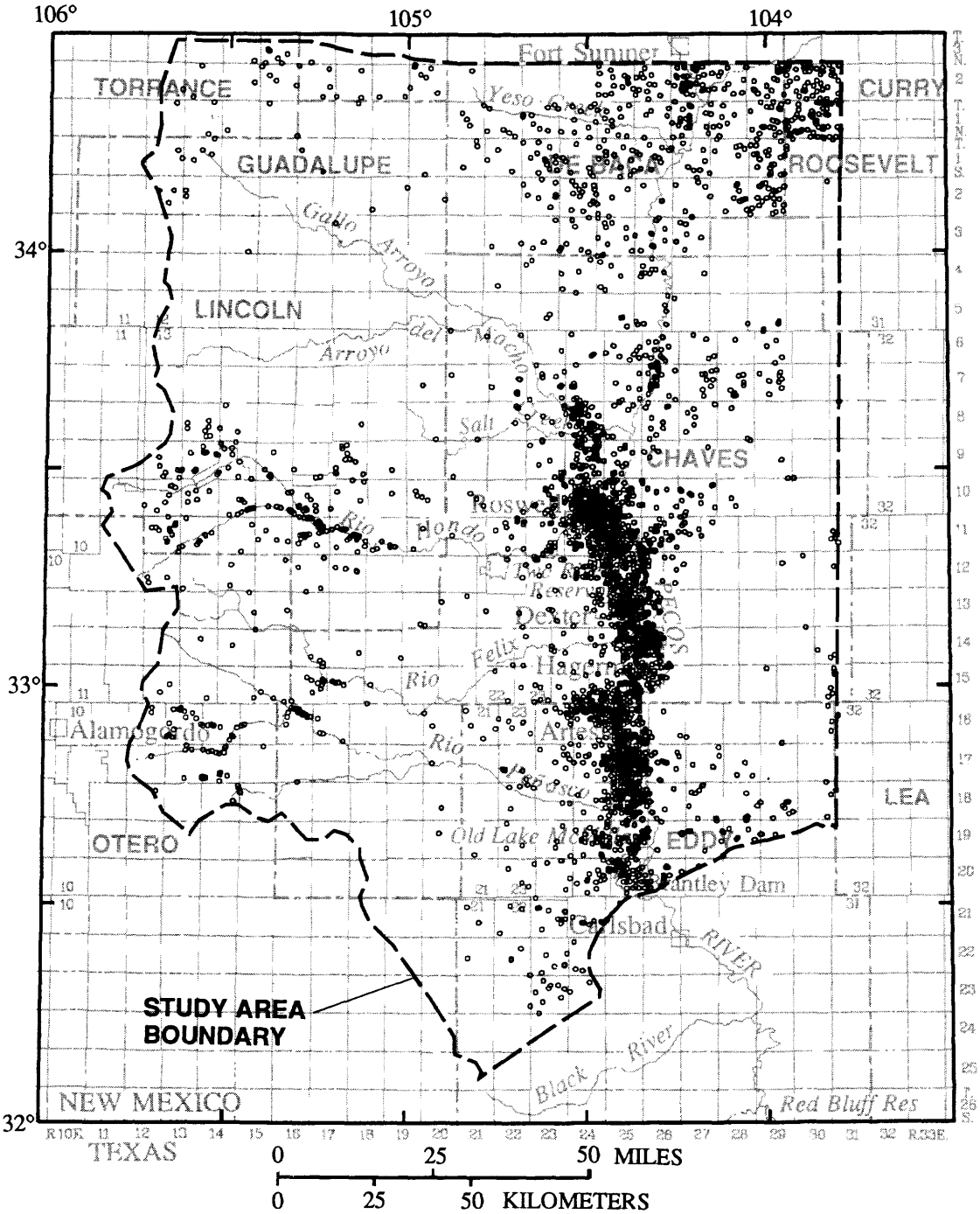


Figure 3.--Wells for which information is available in the National Water Information System.

Table 8.--Records of springs in the vicinity of the Roswell Basin

[Modified from White and Kues, 1992]

EXPLANATION

Location:

Number: see Supplemental Information for explanation of numbering system.

Latitude-longitude: location of the spring in degrees, minutes, and seconds north latitude followed by degrees, minutes, and seconds west longitude.

Name: common name or unique designation of spring, if available.

Owner: owner of spring at time inventoried.

Topographic situation: brief description of physical setting in the immediate area of the spring.

Source: geologic formation from which spring issues. (?) indicates uncertain geologic source. Quaternary: Qab - alluvium, bolson deposits, and other surficial deposits; Qal - alluvium, mainly in flood plains; Qcl - conglomerate. Tertiary: Ti - dikes, sills, and plugs. Cretaceous: Kmv - Mesaverde Group. Triassic: Trc - Chinle Formation; Trs - Santa Rosa Sandstone. Permian: Pat - Artesia Group, undivided; Psr - Seven Rivers Formation; Psa - San Andres Limestone; Psf - Fourmile Draw Member of San Andres Formation; Psg - San Andres Limestone and Glorieta Sandstone; Py - Yeso Formation.

Altitude: altitude of spring estimated from topographic maps, in feet above sea level.

Yield: water-discharge rate from spring on date specified, in gallons per minute. All yields are estimated unless designated as follows: B - measured using bucket; M - measured using unspecified method; NV - no visible flow; PS - measured using 3-inch Parshall flume; R - reported in referenced literature.

Temperature: measured at spring in degrees Celsius ($^{\circ}$C), converted to degrees Fahrenheit ($^{\circ}$F).

Specific conductance: measure of the ability of a water sample to conduct an electrical current. Reported in microsiemens per centimeter at 25 degrees Celsius.

Use: D - domestic, I - irrigation, N - none, P - public supply, S - stock.

Reference: publication(s) used as source of reported data. See Selected References section for complete citations. * indicates unpublished information on file at the U.S. Geological Survey, Water Resources Division, Albuquerque, New Mexico.

Remarks: additional miscellaneous information. CA - chemical analysis of water sample available from U.S. Geological Survey; CAR - chemical analysis of water sample available from cited reference.

– indicates no data. <, less than.

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
1N.23E.15.423	--	De Baca	La Concucion	G. Fields	Hillside, north of Yeso Creek	Trs	4,428	--	--	--	--	--	--	Mourant and Shomaker, 1970	No flow. Ruins at site.
2N.26E.15.214	342412-1041150	De Baca	--	--	Left bank of Pecos River	--	3,950	--	12-15-39	--	--	3,450	--	*	CA. Location number approximated. Seep, left bank of Pecos River; flows into no. 1 drain at river's edge.
								10	02-26-40	--	--	4,210	--	*	CA.
2N.26E.36.313	342106-1041023	De Baca	--	--	do.	--	3,919	0.1	06-10-40	--	--	2,210	--	*	CA. Reported 2N.26E.35.000; location number approximated. Seep near mouth of lower drain at head of drainage.
								--	04-01-41	--	--	2,090	--	*	CA.
3N.28E.32.444	--	De Baca	Taiban Spring	Triangle Cattle	Arroyo	Trc	4,100	3	09- -66	19.0	66	1,500	S	Mourant and Shomaker, 1970	South embankment of AT&SF R.R.
3N.30E.33.400	342604-1034755	Roosevelt	Spring #56	--	Arroyo	--	4,340	--	04-01-48	--	--	1,030	--	*	CA. Approximately ½ mile north of Highway 60.
1S.23E.1.313	341454-1042908	De Baca	Conejos Spring	--	Head of Little Conejos Creek	--	4,348	NV	12-11-39	--	--	865	--	*	CA.
1S.24E.20.442	341212-1042613	De Baca	Mum Spring	John Trigg	Channel of Conejos Creek	Pat	4,090	--	12-11-39	--	--	3,220	--	Mourant and Shomaker, 1970	CA.
1S.27E.14.121	--	De Baca	Black Spring	Ben Hall	Hollow	Trc	4,132	--	--	--	--	--	S	do.	Specific conductance exceeds 6,000.

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
1S.27E.22.333	341220-1040600	De Baca	Cibolo Spring	Ben Hall	Hillside	Trc	4,080	1	03-01-66	--	--	640	S	Mourant and Shomaker, 1970	CA.
2S.21E.29.332	--	De Baca	Burro Spring	Melvin R. Key	do.	Qab	4,600	--	--	16	61	2,300	--	do.	--
2S.24E.13.231	340815-1042222	De Baca	Blanco Spring	--	Channel of Blanco Canyon	--	3,985	--	12-12-39	--	--	3,300	--	*	CA.
2S.24E.28.133	340726-1042603	De Baca	Lovelady Spring	Tom Deck	Head of Lovelady Draw	Pat	4,055	--	12-15-39	--	--	2,950	S	Mourant and Shomaker, 1970	CA.
2S.25E.3.312	340944-1041837	De Baca	Shaw Spring	John Trigg	Arroyo in Pecos Valley flat	do.	3,815	15	12-12-39	--	--	3,110	S	do.	CA. Reported as 2N.25E.4.411, altitude 3,875.
2S.25E.18.343	340740-1042138	De Baca	Blanco Spring (#2)	--	Channel of Blanco Canyon	--	3,930	--	12-12-39	--	--	2,980	--	*	CA.
2S.25E.33.111	340552-1041936	DeBaca	Salt Spring	Sea Cattle Co.	Valley flat	Pat	3,775	2	10-19-40	--	--	18,950	--	Mourant and Shomaker, 1970	CA.
3S.22E.14.211	340320-1043604	DeBaca	Mora Springs	W.M. Key, Sr.	Arroyo de la Mora	do.	4,200	--	09-30-65	--	--	2,720	S	do.	CA.
5S.25E.24.444	335104-1041546	Chaves	Sixmile Spring	--	Sixmile Draw	--	3,695	5.5	03-13-39	--	--	2,950	--	*	CA.
5S.25E.36.423	334932-1041554	Chaves	Crockett Spring	--	Crockett Draw	--	3,705	2	03-13-39	--	--	3,570	--	*	CA.
6S.27E.30.313	334544-1041423	Chaves	Bosque Spring	--	Arroyo bottom	Qal	3,815	--	03-10-39	--	--	3,050	--	*	CA.
								--	12-13-56	18	64	2,800	--	*	Sample collected from spring pool.

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
7S.16E.7.434	--	Lincoln	Macho Spring	--	Head of Arroyo del Macho	Qal, Psf	5,910	35	08-10-77	21	70	800	--	Davis and others, 1980	CAR. Spring discharges at bottom of large pond.
7S.16E.22.443	--	Lincoln	Kyle Harrison Spring	--	Tributary arroyo to Kyle Harrison Canyon	Qal, Psr	6,080	21	08-10-77	16	61	500	--	do.	CAR.
8S.15E.24.242	333605-1052504	Lincoln	Upper Padilla Spring	V.M. Grantham	Hillslope	Ti	8,280	3	05-08-56	10.5	51	158	N	Mourant, 1963	CA. Lincoln National Forest. Called Padilla Spring on 1949 topographic sheet.
8S.16E.30.343	333437-1052438	Lincoln	Lower Padilla Spring	do.	do.	do.	7,040	450	11-03-55	--	--	--	D,S	do.	Lincoln National Forest.
								150	05-08-56	9.5	49	140	--	do.	CA.
9S.11E.34.410	--	Lincoln	--	--	Hillside	Qal	8,025	10	08-09-77	13.0	55	590	--	Davis and others, 1980	--
9S.13E.32.223	--	Lincoln	Lamay Spring	Lincoln National Forest	Arroyo	Qal	7,230	.75B	08-10-77	17.0	63	2,200	--	Davis and others, 1980	CAR.
9S.13E.33.210	--	Lincoln	--	--	North wall, Ferguson Canyon	do.	7,080	1	08-10-77	15.0	59	1,580	--	do.	--
9S.15E.15.331	333117-1052805	Lincoln	--	A.T. Pfingsten	Terrace, Rio Bonito	Psa	5,972	--	05-17-39	--	--	580	--	Mourant, 1963	CA.
								250	10-06-55	13.5	56	773	N	do.	CA. Spring located in fault zone; flow intermittent.
9S.16E.16.134	--	Lincoln	Lincoln Spring	U.S. Forest Service	Canyon	Py?	6,060	10	01-13-56	--	--	--	N	do.	Spring located in highly folded and faulted zone.

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
9S.16E.34.141	--	Lincoln	Hulbert Spring	--	Hillside, Rio Bonito valley	Py	5,760	15-20	08-11-77	18.0	64	870	--	Davis and others, 1980	--
9S.18E.5.123	333345-1051120	Lincoln	Blue-water Spring	Richard Pryor	Base of Capitan Mountains	Py?	5,540	10	04-13-56	17.5	63	2,200	D,S	Mourant, 1963	CA.
10S.11E.2.341	--	Lincoln	--	Lincoln National Forest	North wall, Bonito Creek	Ti	7,650	1	08-09-77	12.0	54	1,000	--	Davis and others, 1980	Spring water issues from prospect pit and is milky yellow.
10S.12E.12.144	--	Lincoln	--	do.	Rio Bonito valley	Qal, Ti	7,500	32M	08-09-77	11.0	53.5	280	--	do.	CAR. Spring water flows into Bonito Lake.
10S.12E.24.431	--	Lincoln	Little Creek Spring	do.	Head of canyon	Ti	7,990	0.4B	08-09-77	14.0	57	370	--	do.	CAR.
10S.12E.25.140	--	Lincoln	--	do.	Small tributary to Telephone Canyon	do.	7,990	54B	08-09-77	15.0	59	180	--	do.	--
10S.13E.8.241	--	Lincoln	--	--	Philadelphia Canyon	do.	7,200	4	08-10-77	14.0	57	955	--	do.	--
10S.13E.26.144	--	Lincoln	-	E.J. Blaylock	Little Creek valley	Kmv	--	2	12-08-55	11.5	53	--	S	Mourant, 1963	Seepage at streambank.
10S.16E.12.322	332716-1051932	Lincoln	Emil Fritz Spring	A.T. Pfingsten	North wall, Rio Bonito valley	Py	5,550	5	09-29-55	17.0	63	1,200	D,S	do.	CA.
								--	08-11-77	18.0	65	1,060	D	Davis and others, 1980	Reported as 10S.16E.12.411.

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance				
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
10S.16E.26.441	332430-1052008	Lincoln	Peter Hurd Spring	Peter Hurd	Terrace, Rio Ruidoso	Qal, Py	5,360	100	08-23-55	15.0	59	1,820	I	Mourant, 1963	CA.
								200	05-16-77	9.0	48	2,100	D	Davis and others, 1980	CAR.
10S.16E.27.000	--	Lincoln	Crouse Spring	Manuel Corona	Terrace, Rio Ruidoso	Qal	--	--	--	--	--	--	N	Mourant, 1963	CAR. Spring has ceased to flow.
10S.17E.29.414	332438-1051711	Lincoln	Colonel Fritz Spring	A.T. Pfingsten	North wall, Rio Bonito valley	Psr	5,320	--	05-23-55	17.0	63	861	D,I	do.	CA.
								390	10-19-55	17.0	63	--	--	do.	--
								--	08-11-77	18.0	65	735	D	Davis and others, 1980	Also used as supply for trout farm.
10S.23E.36.200	332420-1043345	Chaves	North Spring River Spring	--	Gravel pit at head of North Spring River	--	3,600	22,400	02- -1889	--	--	--	--	--	--
								34,496	11-06-01	--	--	--	--	Meinzer, 1927	Meinzer cites F.H. Newell and W.A. Wilson as sources for early yield estimates.
								0	1926	--	--	--	--	do.	do.
10S.24E.32.100	332855-1043205	Chaves	North Berrendo Spring	--	Middle Berrendo Creek	--	3,600	14,918	1900	--	--	--	--	*	--
								2,240	1926	--	--	--	--	Meinzer, 1927	Meinzer cites W.A. Wilson, County Surveyor, as a source for the yield estimate.
								0	1933						

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
10S.24E.14.100	332700-1042910	Chaves	Middle Berrendo Spring	--	Near Arthur Lake	--	3,550	14,918	1900	--	--	--	--	*	--
								1,344	1926	--	--	--	--	Meinzer, 1927	--
								0	1932	--	--	--	--	*	--
10S.24E.16.231	332648-1043050	Chaves	--	--	Berrendo Creek	--	3,560	--	02-10-39	--	--	2,440	--	*	CA.
10S.24E.17.200	332645-1043140	Chaves	South Berrendo Spring	--	do.	--	3,590	14,918	1900	--	--	--	--	*	--
								0	1926	--	--	--	--	Meinzer, 1927	--
10S.24E.22.441	332534-1042950	Chaves	--	Roswell Country Club	Inflow to artificial lake	Qal	3,560	175	08-15-52	--	--	6,550	--	*	CA. Used to fill country club lake.
								--	01-19-53	--	--	6,670	--	*	CA.
								--	01-25-54	18.0	64	6,920	--	*	CA.
10S.24E.34.221a	332427-1042927	Chaves	--	E.W. Lander	Bluff overlooking North Spring River near confluence with Rio Hondo	Pat	3,550	150	07-23-52	--	--	5,680	--	*	CA.
								--	08-21-53	--	--	6,380	--	*	CA.
								--	09-13-57	18.0	64	6,210	--	*	CA.
								--	09-14-61	17.0	63	6,190	--	*	CA.
10S.24E.35.220	332430-1042816	Chaves	--	--	Meander bend south of Rio Hondo's man-made channel	--	3,510	30	03-25-40	--	--	5,400	--	*	CA.
								--	03-31-41			5,330	--	*	CA.

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
11S.13E.8.411	--	Lincoln	--	Lincoln National Forest	Confluence of North and South Forks of Spring Canyon	Qal, Ti	7,250	2	08-02-77	18.0	64	780	--	Davis and others, 1980	--
11S.13E.14.312	--	Lincoln	Bog Spring	do.	Confluence of arroyos in Cree Meadows	Qal	6,805	--	08-12-77	12.0	54	2,250	--	do.	CAR.
11S.14E.14.200	--	Lincoln	Seeping Springs Lakes	do.	Valley bottom of Rio Ruidoso	Qal, Py	6,125	415	08-12-77	15.0	59	1,650	--	do.	CAR. Yield for seven springs that feed the bottom of the ponds used for recreation.
11S.14E.28.321	331937-1053507	Lincoln	Hale Spring or Aqua Fria Spring	Ruidoso Downs and Bruce Griffith	Hillside	Py	6,595	246	04-27-55	12.0	54	1,570	P,D	Mourant, 1963	CA.
								220	08-02-77	14.0	57	1,800	P,D	Davis and others, 1980	CAR.
11S.14E.32.233	--	Lincoln	Baston Spring	--	Hillside of Pine Canyon	do.	6,715	2	08-02-77	13.0	56	1,070	--	do.	--
11S.24E.22.200	332035-1042925	Chaves	South Spring River Spring	--	Head of South Spring River	--	3,580	32,704	02-1889	--	--	--	--	Meinzer, 1927	Meinzer cites F.H. Newell for this yield estimate.
								12,544	02- -02	--	--	--	--	do.	Flow rapidly decreased after the drilling of artesian wells in the area.
								0	1904	--	--	--	--	*	--

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
11S.25E.5.400	332307-1042517	Chaves	--	J.P. White	Artificial lake	Qal	3,470	--	05-14-57	19.5	67	7,690	S	*	Supplies artificial lake.
11S.25E.12.111	332213-1042142	Chaves	--	--	Marsh area	--	3,470	--	02-27-57	--	--	3,640	--	*	CA.
11S.25E.13.223	332142-1042058	Chaves	--	--	Mouth of Comanche Draw	Qal	3,460	--	02-27-57	--	--	7,470	--	*	CA.
11S.25E.15.313	332116-1042355	Chaves	--	--	At road crossing	--	3,460	100	04-10-40	--	--	4,490	--	*	CA.
11S.25E.26.400	331918-1042147	Chaves	--	--	--	--	--	--	04-04-40	--	--	3,920	--	*	CA.
11S.26E.2.442	332322-1041807	Chaves	Comanche Spring	I.M. Sartin	Marsh area in Comanche Draw	Pat	3,560	--	11-13-38	--	--	3,310	S	*	CA.
								10-15	07-31-52	--	--	4,160	--	*	CA.
								--	01-26-54	--	--	3,540	--	*	CA.
								1	06-07-71	16.5	62	5,200	--	*	CA.
11S.26E.14.441	332139-1041822	Chaves	--	--	Small arroyo	--	3,565	--	06-07-71	25.0	77	3,030	--	*	CA.
11S.26E.27.321	332004-1041955	Chaves	--	Bottomless Lakes State Park	North end of Figure Eight Lake	--	3,450	--	10-25-39	--	--	5,640	--	--	CA.
11S.26E.34.343	331856-1041953	Chaves	--	do.	South of Lea Lake	Pat	3,460	2	06-14-56	20.5	69	4,230	--	*	CA.
12S.13E.3.121	331814-1054010	Otero	Carrizo Spring	Mescalero Apache	Base of hillslope	Psa	6,750	3	12-22-47	8.0	46	1,280	N	Mourant, 1963	CA.

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance				
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
12S.14E.28.432	331409-1053443	Otero	Whitetail Springs	Mescalero Apache	Tributary canyon to Whitetail Canyon	Psa	7,670	1.5	09-29-60	13.0	55	839	D,S	*	CA.
14S.14E.18.312	330548-1053713	Otero	Elk Springs	do.	North wall, Elk Canyon	Psa	7,595	4	10-09-60	10.0	50	711	S,D	*	CA.
15S.13E.29.144	325858-1054158	Otero	Silver Spring	Lincoln National Forest	Canyon confluence	Py(?)	8,380	3-5	03-20-56	--	--	590	--	Hood, 1960	CA.
15S.13E.29.143	325855-1054155	Otero	--	do.	do.	Py	8,300	1-2	03-29-56	--	--	590	S	do.	CA.
15S.17E.13.143	330048-1051335	Chaves	--	--	Head spring of Rio Felix	Qal	5,470	<448	No date	18.0	64	--	--	Fisher, 1906; Renick, 1926.	CAR.
15S.26E.27.232	325920-1041923	Chaves	--	--	Right bank, Pecos River	Qal	3,335	--	06-04-40	--	--	39,300	--	National Resources Planning Board, 1942	CA. Spring just below gaging station.
16S.12E.2.231	325709-1054105	Otero	--	Lincoln National Forest	Young Canyon	--	8,300	150	08-07-57	--	--	793	I	*	CA.
16S.12E.3.144	325707-1054220	Otero	--	Village of Cloudcroft	Pumphouse Canyon	Py(?)	8,400	60R	03-29-56	6.5	44	622	P	*	CA.
						Qal	--	60	06-03-77	--	--	500	--	Gross and others, 1979	CAR.
16S.12E.19.244	--	Otero	--	Lincoln National Forest	Russia Canyon bottom	do.	8,825	7	05-26-77	6.0	43	425	--	do.	Headwater spring of Russia Canyon.
16S.13E.32.321	--	Otero	Goat Springs	do.	Curtis Canyon bottom	do.	7,450	15B	06-02-77	5.0	41	560	--	do.	--

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance				
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
16S.14E.26.343	--	Otero	Posey Spring	Lincoln National Forest	Peñasco Valley bottom	Qal, Py	6,520	1,000	06-03-77	11.0	52	760	--	Gross and others, 1979	CAR. Spring forms pond in Peñasco Valley.
16S.14E.31.113	--	Otero	Mikison Spring	do.	Mikison Canyon wall	Qal	7,500	9B	06-03-77	4.5	40	470	--	do.	CAR. Spring developed by U.S. Forest Service.
16S.14E.32.444	--	Otero	Lightning Springs	do.	North wall of Curtis Canyon	Qal, Psr	7,050	4	06-03-77	8.0	46	560	S	do.	Composite measurements for two springs; spring developed by U.S. Forest Service.
16S.16E.2.323	325658-1051656	Chaves	Cleave's Spring	--	Small canyon	Psr	5,920	15	06-02-77	10.0	50	380	D	New Mexico Bureau of Mines and Mining reserves, unpublished	CAR. Spring formerly supplied now-abandoned school. Issues from breccia zone below former orifice.
16S.16E.3.300	--	Chaves	Lower Peñasco head spring	--	Rio Peñasco	--	5,720	--	No date	--	--	--		Fisher, 1906; Renick, 1926	CAR.
16S.16E.3.434	325638-1051735	Chaves	Williams and Reeves	--	do.	--	5,720	--	08-04-54	15.0	59	980	I	*	CA. Collection from spring opening in spring area.
16S.16E.11.243	325610-1051629	Chaves	--	Boyd Williams	Off road near cemetery	--	5,700	--	No date	--	--	--	--	--	CA.
								10	08-04-54	15.5	60	431	D, P	*	CA.
16S.16E.11.342	325557-1051648	Chaves	Paul Springs	Charles Mulcock	Bluff of Rio Peñasco	Psr	5,725	--	08-19-25	15.5	60	--	D, S	Renick, 1926	CA. Called Boyd William's Spring by Renick, 1926.
								50.3M	1963	--	--	--	--	Dinwiddie, 1963	--
								--	06-02-77	9.0	48	380	D	Gross and others, 1979	Spring water in perched aquifer.

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
16S.24E.12.131	325624-1043257	Eddy	--	Jess Funk	Cottonwood Creek	Psa	3,539	900	08-28-68	--	--	1,910	S,I	*	Artesian spring.
17S.11E.11.230	--	Otero	--	Lincoln National Forest	Rio Peñasco Canyon	Qal, Py	7,950	147.5PS	05-26-77	5.0	41	475	--	Gross and others, 1979	CAR. Headwater spring of the Rio Peñasco; issues from a large marshy area.
17S.11E.13.432	--	Otero	--	do.	do.	Py	--	15	05-25-77	0.0	32	450	--	do.	--
17S.12E.12.443	--	Otero	--	do.	North wall, Rio Peñasco Canyon	do.	8,250	63.2PS	05-25-77	1.0	34	500	--	do.	--
17S.12E.14.314	--	Otero	--	do.	South wall, Wills Canyon	do.	8,200	10	05-24-77	3.0	37	460	--	do.	--
17S.12E.14.422	--	Otero	--	do.	North wall, Wills Canyon	Psg	8,175	0.5	05-24-77	--	--	490	--	do.	--
17S.12E.16.122	--	Otero	--	do.	South wall, Rio Peñasco Canyon	Py	8,175	5	05-24-77	1.0	34	470	--	do.	--
17S.12E.16.431	--	Otero	--	do.	North wall, Wills Canyon	Psr	8,700	2	05-24-77	1.0	34	455	--	do.	CAR.
17S.12E.17.121	--	Otero	--	do.	Rio Peñasco Canyon	Qcl	8,250	25	05-25-77	0.0	32	470	--	do.	Four springs issuing from a marshy area in colluvium were combined for these measurements; one spring issues from a circular orifice in colluvium.
17S.12E.17.144	--	Otero	Bluff Springs	do.	South wall, Rio Peñasco Canyon	Py	8,225	175PS	05-24-77	0.0	32	490	--	do.	CAR. Two springs (10 yards apart) were combined for these measurements.

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
17S.12E.20.444	--	Otero	--	Lincoln National Forest	Wills Canyon	Qal	8,475	93.6PS	05-24-77	0.0	32	470	--	Gross and others, 1979	--
17S.12E.21.331	--	Otero	--	do.	do.	Py	8,525	12.0	05-24-77	0.0	32	500	--	do.	--
17S.12E.26.223	--	Otero	--	do.	Hay Canyon	Qc1	8,525	9.5B	05-27-77	1.0	34	540	--	do.	Posted as "Masterson Springs" but ½ mile downstream from "Masterson Springs" on topographic map.
17S.13E.20.314	--	Otero	--	do.	do.	Py	8,025	16B	05-27-77	2.0	36	520	--	do.	At least two springs contribute to the flow.
17S.13E.25.441	--	Otero	--	do.	North wall, Aqua Chiquita Canyon	do.	7,400	15	05-27-77	5.0	41	510	--	do.	CAR. Two springs combined for these measurements.
17S.13E.31.122	--	Otero	--	do.	Telephone Canyon	Qal	8,100	2-3	05-27-77	2.0	36	560	--	do.	Two springs combined for these measurements; both supply a small stock and trout pond.
17S.13E.32.144	--	Otero	Cride-bring Spring	do.	Junction of Spring and Telephone Canyons	do.	7,850	3-4	05-27-77	5.0	41	480	--	do.	--
17S.14E.7.243	--	Otero	Weems Spring	do.	Bear Creek	Py	6,950	1B	05-26-77	--	--	525	--	do.	Spring developed.
								2.4B	08-18-77	14.5	58	--	--	--	--

Table 8.--Records of springs in the vicinity of the Roswell Basin--Continued

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
18S.10E.15.113	324455-1055433	Otero	Dog Canyon Spring	Lincoln National Forest	Canyon wall at mouth of Dog Canyon	--	--	--	04-07-54	19.0	66	886	N	Hood, 1958	CA.
18S.12E.11.122	--	Otero	--	do.	Cienaga near head of Potato Canyon	Qal	8,650	2.6B	05-27-77	1.0	34	480	--	Gross and others, 1979	--
18S.12E.26.423	--	Otero	Sand Springs	do.	Aqua Chiquita Canyon	Psg	8,550	38PS	05-27-77	2.0	36	530	--	do.	--
18S.12E.26.411	--	Otero	Barrel Springs	do.	Aqua Chiquita Canyon	Psg	8,570	295PS	05-27-77	2.0	36	550	--	do.	CAR.
								450PS	08-18-77	6.5	44	480	--	do.	Flow slightly higher than the capacity of the Parshall flume.
18S.13E.6.422	--	Otero	--	do.	North wall, Potato Canyon	Py	8,100	5	05-27-77	2.0	36	505	--	do.	Three springs combined for these measurements.
18S.13E.6.434	--	Otero	--	do.	Pepper Canyon	do.	8,250	9	05-27-77	2.0	36	510	--	do.	Two springs combined for these measurements.
18S.13E.21.221	--	Otero	Jeffers Spring	do.	Perk Canyon	Qcl	7,977	33.4PS	05-27-77	3.0	38	600	--	do.	--

Table 8.--Records of springs in the vicinity of the Roswell Basin--Concluded

Location								Yield		Temperature		Specific conductance			
Number	Latitude-longitude	County	Name	Owner	Topographic situation	Source	Altitude (feet)	Gallons per minute	Date	°C	°F	(micro-siemens)	Use	Reference	Remarks
20S.26E.21.112	323350-1042322	Eddy	Bubbling Spring	--	Pecos River bank	Psr	3,220	Low flow	03-10-41	--	--	4,820	--	*	CA. O.E. Meinzer and others (1927) cite a study done by Foster and Yates that showed a connection between the level of Lake McMillan and yield of Major Johnson Springs.
20S.26E.21.143	323333-1042325	Eddy	Twin Boils Spring	--	Major Johnson Springs area along Pecos River 4 miles SW of Lake McMillan	do.	3,220	--	10-11-49	--	--	4,220	--	*	CA.
								--	12-30-64	18.0	64	4,840	--	*	CA.
20S.26E.21.443	323312-1042309	Eddy	Flat Rock Spring	--	do.	do.	3,220	5	05-05-49	--	--	3,440	--	*	CA.
								--	12-30-64	18.0	64	2,820	--	*	CA.
21S.24E.22.123P	322717-1042918	Eddy	Indian Big Spring	--	In Rocky Arroyo	Qal	3,600	--	04-24-38	17.0	63	1,170	--	*	CA. Seven Rivers Hills.
								500-1,000	No date	--	--	--	--	Hendrickson and Jones, 1952.	--
24S.22E.9.214	321410-1044205	Eddy	Sitting Bull Spring	--	Sitting Bull Canyon in stream	Psr	5,000	--	11-23-54	--	--	657	--	*	CA. Spring at contact between San Andreas and Cherry Canyon Formations.

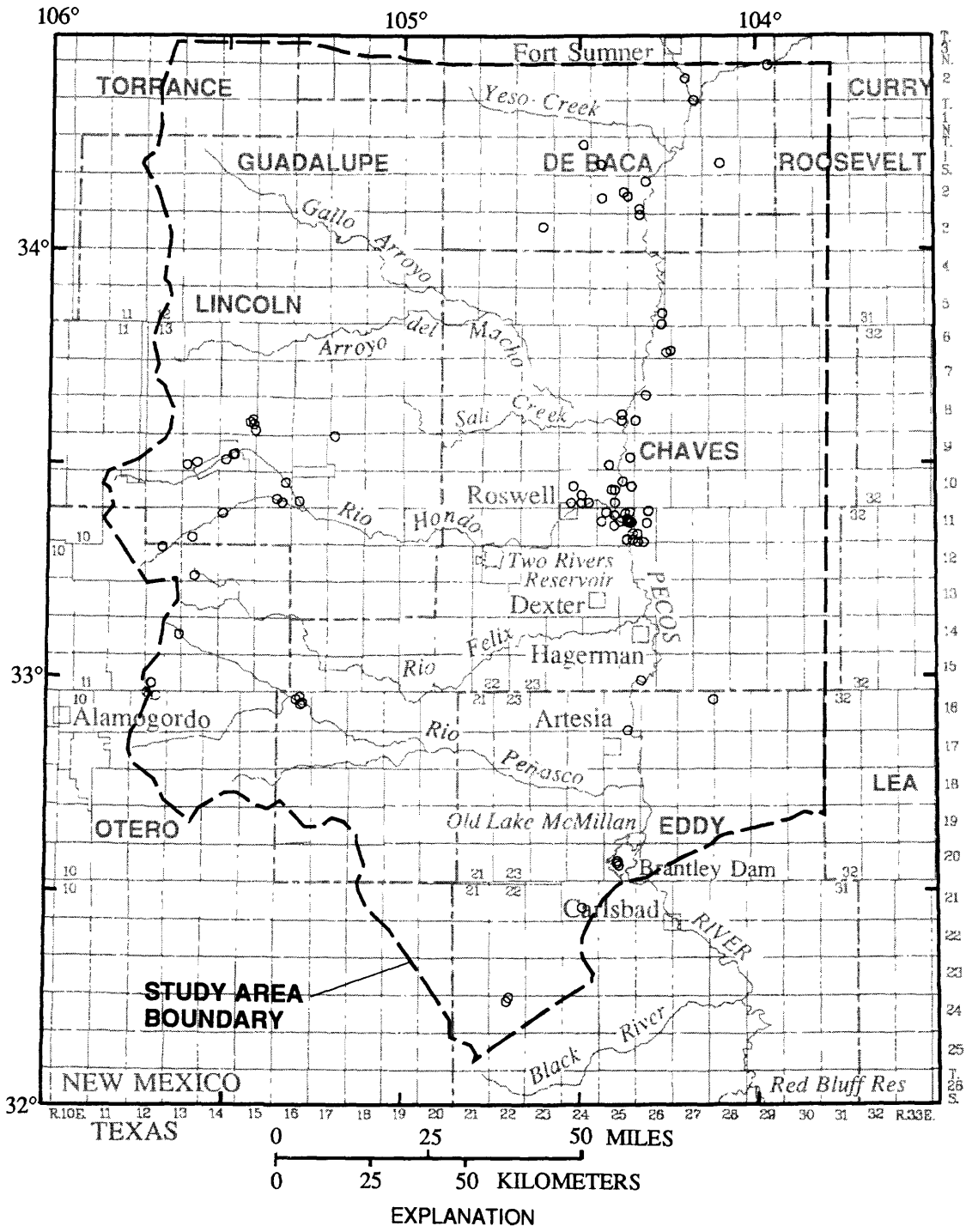


Figure 4.--Springs for which information is available in the National Water Information System.

Ground-Water-Quality Records

Chemical analyses of water from 892 wells and 83 springs in the vicinity of the Roswell Basin are available from NWIS (Maddy and others, 1989). Locations of those wells and springs are shown in figures 5 and 6. Additional analyses of ground water from wells are available from the New Mexico State Engineer Office in Roswell. The availability of chemical analyses in published reports is indicated in the reference column of table 1.

Ground-Water Withdrawals

Ground-water withdrawals from all irrigation, municipal, and industrial wells in the Roswell Basin have been metered since January 1, 1967, by the Roswell Basin watermaster. The annual withdrawal for each metered well was obtained for 1967-89, and was entered into a data base. The data base is maintained at the New Mexico State Engineer Office in Santa Fe. The data base contains the following information for each metered well: township, range, section, subsection, annual water use, and State Engineer file number. The data base does not include the aquifer in which production is derived. It needs to be noted that inoperative meters have been a significant problem throughout the metering period. Adjustments for inoperative meters have been made by the watermaster using energy consumption data and have been incorporated into the data base.

Basin- or county-wide annual withdrawal estimates are also available from several sources. Welder (1988, fig. 4, p. 9) provided estimated ground-water withdrawals for 1938-66 and withdrawals measured by the New Mexico State Engineer Office for 1967-82. Mower (1960, table 11, p. 72-73) provided estimated ground-water withdrawals from the upper and lower aquifers for 1925 and 1938-57. Summaries of withdrawals for subregions and communities in the basin are provided in the annual reports prepared by the Roswell Basin watermaster. These annual reports have been prepared since 1967 and are available from the New Mexico State Engineer Office. Annual ground-water withdrawal by counties and by river basins in New Mexico were reported by Sorensen (1977, 1982) and Wilson (1986; 1992).

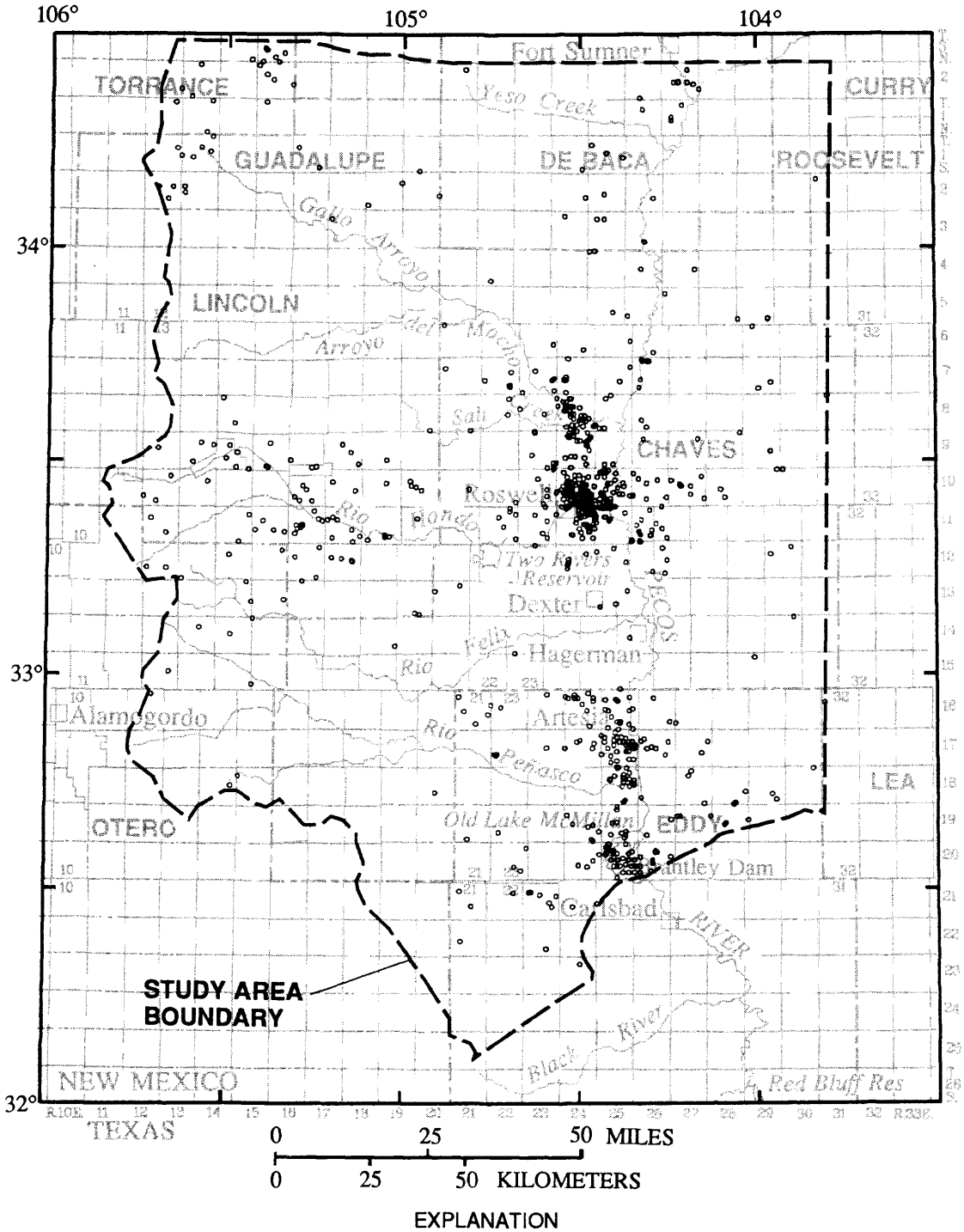


Figure 5.--Wells for which water-quality information is available in the National Water Information System.

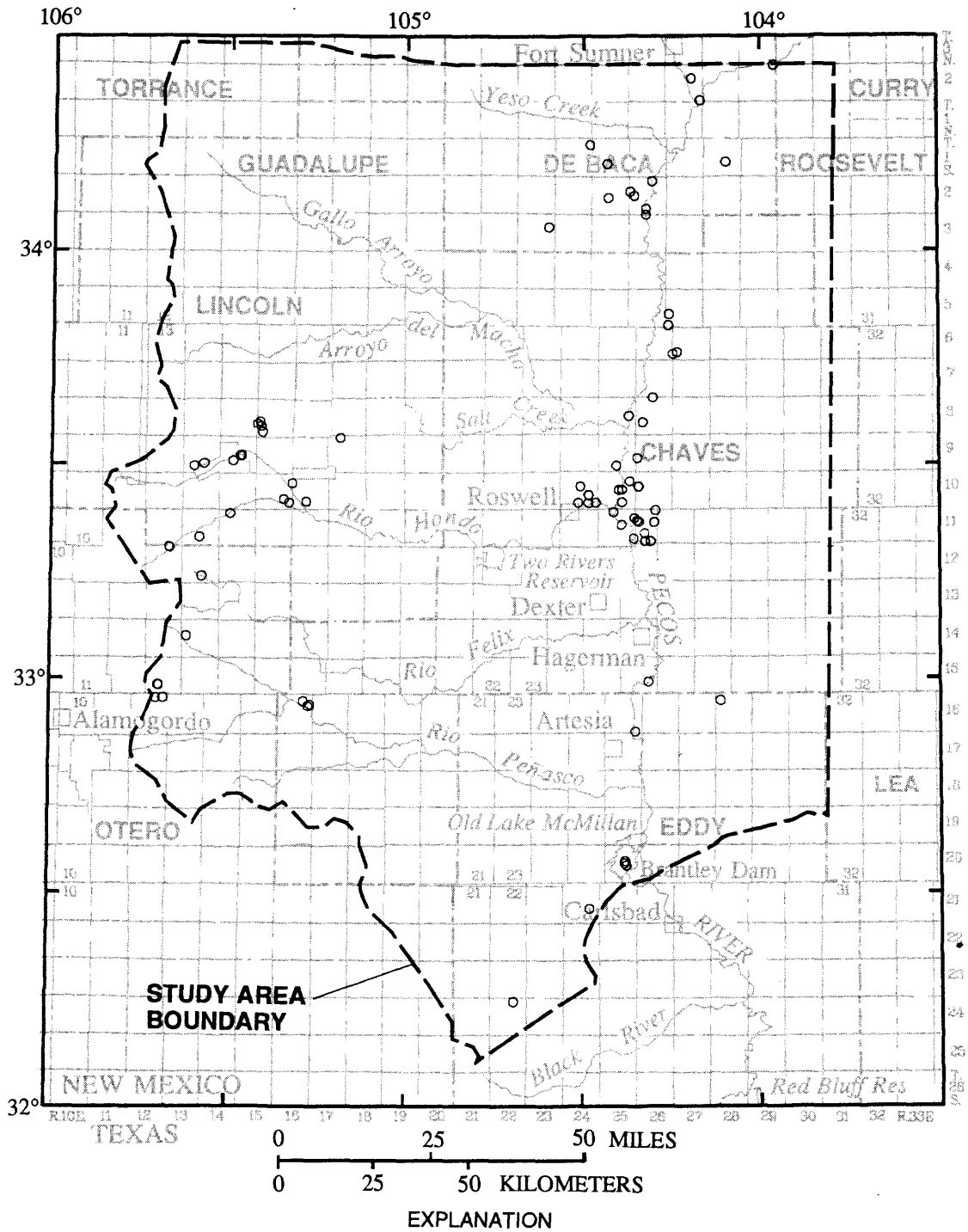


Figure 6.--Springs for which water-quality information is available in the National Water Information System.

Surface-Water Records

The periods of record for continuous-record surface-water gaging stations in the vicinity of the Roswell Basin are listed in table 9. The data for many of those stations are available from NWIS (Dempster, 1990) as indicated in table 9. Figure 7 shows the locations of those stations.

Monthly surface-water summaries for 1888 to 1925 were reported by the New Mexico State Engineer (1926). Detailed surface-water records for 1911-31 were also reported by the New Mexico State Engineer (1913-32). Monthly surface-water summaries for water years prior to 1961 were reported by the U.S. Geological Survey (1960, 1964); the U.S. Geological Survey reports also cite the publications containing more detailed records. Detailed records for water years 1961-90 were also reported by the U.S. Geological Survey (1962-65, 1966-72, 1970, 1974, 1972-75, 1976-91). Miscellaneous surface-water records for the Pecos River basin in New Mexico were reported by Cranston and others (1981).

Estimates of gain in base flow in the Pecos River between the Acme and Artesia streamflow-gaging stations have been compiled by the National Resources Planning Board (1942, p. 51), Flook (1959a, and written commun., 1959), Welder (1988), and the U.S. Geological Survey (data files in Carlsbad, New Mexico). A compilation of these estimates by month for 1905 through 1989 is listed in table 10.

Surface-Water-Quality Records

Surface-water-quality records are available in NWIS (Maddy and others, 1989) for 90 sites in the study area. The number of analyses available for those sites is listed in table 11. The site locations are shown in figure 8.

Surface-Water Diversions

Surface-water diversions in the basin have occurred primarily in the area near Dexter and Hagerman through the Hagerman Canal. Annual surface-water diversions have been compiled annually since 1967 by the Roswell Basin watermaster (files of the New Mexico State Engineer Office, Roswell).

Surface-water diversions pumped directly from the Pecos River between the Acme and Artesia streamflow-gaging stations have been compiled by the National Resources Planning Board (1942, p. 51), Flook (1959a, and written commun., 1959) and the U.S. Geological Survey (in data files in Carlsbad, New Mexico). A compilation of these diversions by month for 1907-89 is listed in table 12.

Table 9.--Period of record for continuous-record surface-water gaging stations in the vicinity of the Roswell Basin

EXPLANATION

Station name: most recently published station name. Parentheses around part of a station name indicate that the enclosed words were used in an earlier published name of that station or as an alternate name.

Station number: unique number assigned to each station in downstream order. This number is the unique identifying number used in the National Water Information System. This number is retained for a given station indefinitely and does not change with a change in station name.

Location: latitude and longitude of the station are shown if they have been published. If latitude and longitude have not been published, township, range, and section of the station are listed if available (see Supplemental Information). If neither numbering system is available, a descriptive location is given in a footnote. Latitude and longitude are shown in degrees, minutes, and seconds north latitude followed by degrees, minutes, and seconds west longitude. "--" in the seconds position indicates station was located to the nearest minute.

Data type: type of continuous-record data collected. D - stream discharge; G - gage height, or gage height and discharge measurements only; E - altitude or gage height; C - reservoir contents.

Period of record: calendar years in which records began or ended. Breaks of less than a year are not shown. A date followed by a dash shows that the station continued in operation beyond 1989.

Drainage area: drainage area upstream from gage, in square miles; a, drainage area is approximate.

Source: source of information compiled in this table. S - New Mexico State Engineer (1959); N - National Water Information System (NWIS); G - U.S. Geological Survey (1971); W - U.S. Geological Survey (1976-91).

-- no data.

Station name	Station number	County	Location	Data type	Period of record	Drainage area (square miles)	Source
Pecos River below Fort Sumner	08385520	De Baca	342053 1041021	D	1957-58;1962-70	5,600a	N
Pecos River below Yeso Arroyo, near Fort Sumner	08385620	De Baca	341340 1041345	D	1964-68	7,000a	N
Pecos River above Huggins Creek, near Roswell	08385640	Chaves	335455 1041640	D	1964-68	7,800a	N
Pecos River near Acme	08386000	Chaves	333210 1042234	D	1921-23;1937-	11,380a	S,N

Table 9.--Period of record for continuous-record surface-water gaging stations in the vicinity of the Roswell Basin--Continued

Station name	Station number	County	Location	Data type	Period of record	Drainage area (square miles)	Source
Rio Ruidoso at Hollywood	08387000	Lincoln	331936 1053738	D	1953-	120a	N
Rio Ruidoso near Glencoe	08387500	Lincoln	Sec. 33, T.10S., R.15E.	G	1910-11*	--	G
Eagle Creek below South Fork, near Alto	08387600	Lincoln	332333 1054316	D	1969-80;1988-	8.14	N
Eagle Creek near Alto	08387800	Lincoln	332329 1053639	D	1969-80	15.7	N
Rio Ruidoso at Coe	--	Lincoln	W 1/2, sec. 25, T.10S., R.15E.	D	1908-9	--	S
Rio Ruidoso at Hondo	08388000	Lincoln	332300 1051630	D	1930-55	290	N
Rio Bonito at Angus	08388500	Lincoln	N 1/2, sec. 15, T.10S., R.13E.	D	1908-9;1930-31	45.5	S,G
Rio Bonito at Hondo	08389500	Lincoln	332320 1051630	D	1930-55	295	N
Rio Hondo at Hondo	08390000	Lincoln	SE 1/4, SE 1/4, sec. 4, T.11S., R.17E.	D	1930-31	--	S,G
Rio Hondo at Picacho	08390100	Lincoln	332125 1050925	D	1908-9;1956-62	715	S,G,N
Rio Hondo at Diamond A Ranch, near Roswell	08390500	Chaves	332057 1045105	D	1908-9;1939-	947	S,G,N
Inlet canal of Hondo Reservoir near Roswell	--	Chaves	(1)	D	1908-9	--	S
Two Rivers Reservoir near Roswell	08390600	Chaves	331755 1044320	E,C	[2]1963-	1,027	G
Rio Hondo below Diamond A Dam, near Roswell	08390800	Chaves	331805 1044312	D	1963-	963	N
Rio Hondo (Hondo River) at Hondo Reservoir site, near Roswell	08392500	Chaves	Sec. 34, T.11S., R.22E.	D	1903-5*;1906	970	S,G
Rio Hondo below Hondo Reservoir outlet, near Roswell	08393000	Chaves	(3)	G	1908*	--	G
Taylor-Moore ditch near Roswell	08393100	Chaves	(4)	D	1905	--	S,G

Table 9.--Period of record for continuous-record surface-water gaging stations in the vicinity of the Roswell Basin--Continued

Station name	Station number	County	Location	Data type	Period of record	Drainage area (square miles)	Source
Rocky Arroyo above Two Rivers Reservoir, near Roswell	08393200	Chaves	331707·1044747	D	1963-80	31a	N
Rocky Arroyo below Rocky Dam, near Roswell	08393300	Chaves	331558 1044206	D	1963-80	65a	N
Rio Hondo at Roswell	08393500	Chaves	332219 1043243	D	[5]1981-	1,070a	N
Hagerman Canal near Roswell	--	Chaves	332410 1042620	D	1939-40	--	S
North Spring River at Roswell	08393600	Chaves	332347 1043253	D	1958-77	19.5	N
Pecos River near Roswell	08394000	Chaves	(6)	G	1903-6*	--	S,G
Miles pump ditch near Dexter	--	Chaves	331200 1041840	D	1939-40	--	S
Reins pump ditch near Dexter	--	Chaves	331145 1041840	D	1939-40	--	S
Pecos River near Hagerman	08394100	Chaves	331008 1041824	D	1968-	13,630a	N
Rio Felix at old highway bridge, near Hagerman	08394500	Chaves	330730 1042040	D	1939-87	932	N
Rio Felix near Hagerman	08395000	Chaves	3307-- 10420--	D	1932-39	934	S,G
Deason pump ditch near Hagerman	--	Chaves	330830 1041840	D	1939-40	--	S
Kiper-Stine-Turner-Hall pump ditch near Hagerman	--	Chaves	380800 1041850	D	1939-40	--	S
McWhirt pump ditch near Hagerman	--	Chaves	330750 1041800	D	1939-40	--	S

Table 9.--Period of record for continuous-record surface-water gaging stations in the vicinity of the Roswell Basin--Continued

Station name	Station number	County	Location	Data type	Period of record	Drainage area (square miles)	Source
Union Central Life Insurance Company High pump ditch near Hagerman	--	Chaves	330750 1041800	D	1939-40	--	S
Union Central Life Insurance Company Low pump ditch near Hagerman	--	Chaves	330720 1041810	D	1939-40	--	S
Kirkland pump ditch near Hagerman	--	Chaves	330630 1041700	D	1939-40	--	S
Eccles pump ditch near Hagerman	--	Chaves	330510 1041730	D	1939-40	--	S
Buffalo Valley pump ditch near Hagerman	--	Chaves	330300 1041620	D	1939-40	--	S
Haroldale pump ditch near Hagerman	--	Chaves	330220 1041610	D	1939-40	--	S
Pecos River near Lake Arthur	08395500	Chaves	325918 1041920	D	1938-	14,760a	N
Haven pump ditch near Lake Arthur	--	Chaves	325910 1041930	D	1939-40	--	S
Evans pump ditch near Lake Arthur	--	Chaves	325840 1042120	D	1939-40	--	S
Lawrence Ranch pump ditch near Lake Arthur	--	Eddy	325730 1042140	D	1940	--	S
Cottonwood Creek near Lake Arthur	08396000	Eddy	325455 1042200	D	1932-64	199	N
Woods pump ditch near Artesia	--	Eddy	325010 1041930	D	1939-40	--	S
Pecos River near Artesia (Dayton)	08396500	Eddy	325025 1041923	D	[7]1905-	15,300a	N
Rio Peñasco (Peñasco River) at Elk	08397450	Chaves	Sec. 5, T.16S., R.16E.	G	1910-11*	--	G
Rio Peñasco near Elk (Peñasco River at Cleve's Ranch)	08397500	Chaves	Sec. 12, T.16S., R.17E.	G	1911*	--	G

Table 9.--Period of record for continuous-record surface-water gaging stations in the vicinity of the Roswell Basin--Continued

Station name	Station number	County	Location	Data type	Period of record	Drainage area (square miles)	Source
Rio Peñasco near Dunken	08397600	Chaves	325255 1051040	D	1956-62	583	N
Rio Peñasco at Y.O. Crossing near Hope	--	Chaves	(8)	D	1921-29	730	S
Rio Peñasco at (near) Dayton	08398500	Eddy	324436 1042449	D	1951-	1,060	N
Rio Peñasco near Dayton	--	Eddy	(9)	D	1905-6	1,300a	S
Pecos River (Kaiser Channel) (Kaiser Lake-McMillan Channel) near Lakewood	08399500	Eddy	324122 1041753	D	1950-	--	N
Fourmile Draw near Lakewood	08400000	Eddy	324020 1042207	D	1951-	265a	N
Lake McMillan near (at) Lakewood	08400500	Eddy	323542 1042049	E,C	[10]1918-89	16,990a	G,N,W
Pecos River below McMillan Dam (near Lakewood)	08401000	Eddy	323540 1042059	D	1906-11*; 1939-40;1946-88	16,990a	G,N
Pecos River above Seven Rivers, near Lakewood	08401100	Eddy	323443 1042242	D	[11]1974-87	17,000a	N
North Seven Rivers near Lakewood	08401150	Eddy	323858 1042348	D	1989-	329a	N
South Seven Rivers near Lakewood	08401200	Eddy	323519 1042517	D	1963-	220a	N
Brantley Lake near Carlsbad	08401450	Eddy	323248 1042243	E,C	1988-	17,650a	N

Table 9.--Period of record for continuous-record surface-water gaging stations in the vicinity of the Roswell Basin--Concluded

Station name	Station number	County	Location	Data type	Period of record	Drainage area (square miles)	Source
Pecos River below Brantley Dam (Major Johnson Springs), near Carlsbad	08401500	Eddy	323238 1042200	D	[12]1947-50;1971-	17,650a	N
Rocky Arroyo at highway bridge, near Carlsbad	08401900	Eddy	323023 1042228	D	1963-	285a	N
Pecos River at damsite 3, near Carlsbad	08402000	Eddy	323040 1041958	D	1939-40;1944-	17,980a	N

[1]On inlet canal from Rio Hondo to Hondo Reservoir about 12 miles southwest of Roswell.

[2]Month-end contents only prior to October 1965.

[3]At the bridge across Rio Hondo a short distance downstream from outlet canal of Hondo Reservoir.

[4]Between diversion dam and reservoir site 12 miles southwest of Roswell.

[5]Records for June 1903 to February 1906 published in Water-Supply Paper 358 are unreliable and should not be used.

[6]At the highway bridge 8 miles southwest of Roswell and about 200 feet downstream from the mouth of Rio Hondo.

[7]Records for August 22-31, 1934, and from October 1936 to April 1937, published in Water-Supply Papers 763 and 828, are not reliable and should not be used.

[8]About 200 yards upstream from the Y.O. crossing at Hope-El Paso Road with the Rio Peñasco about 15 miles from Hope.

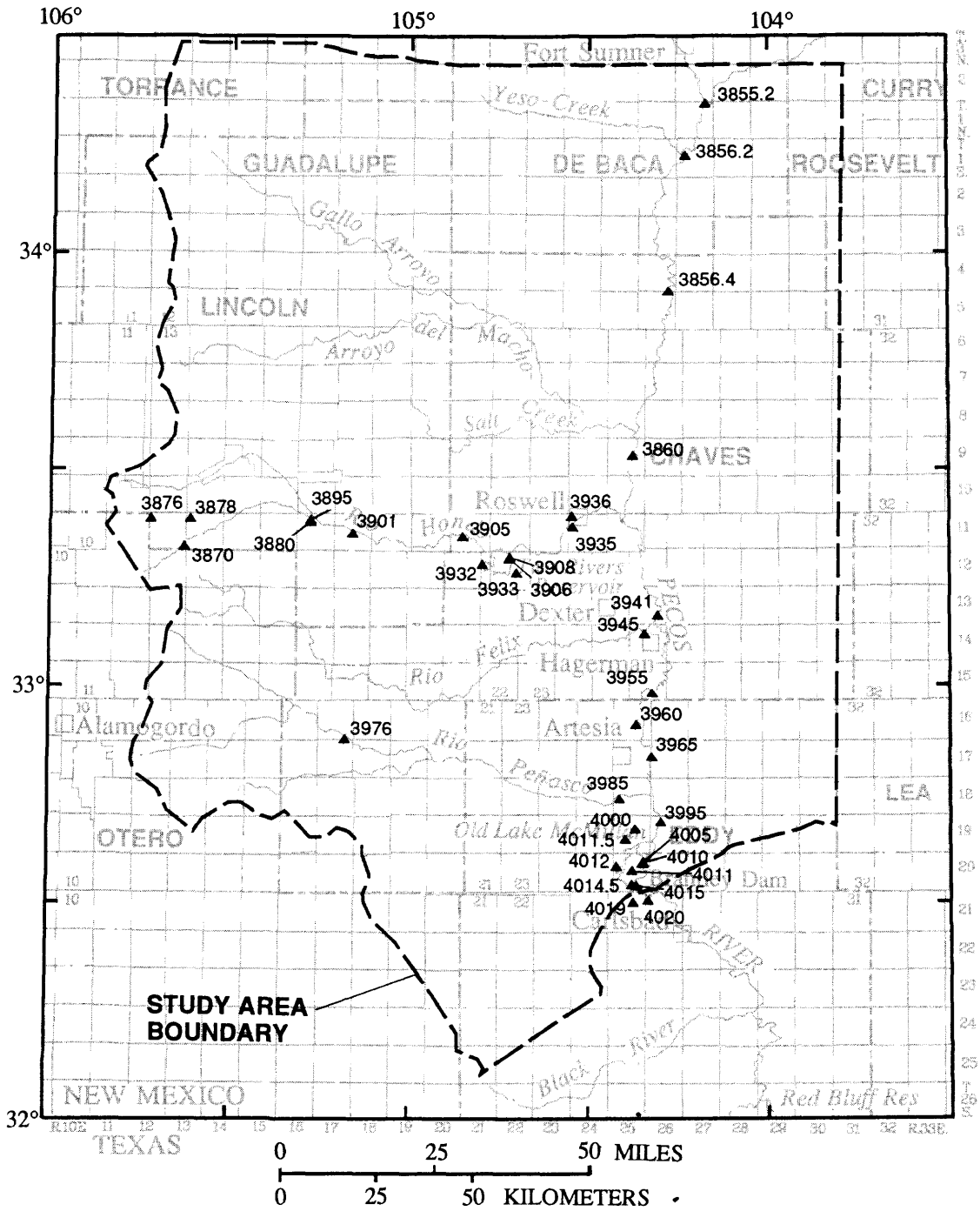
[9]Two miles east and 1 mile north of Dayton and about 1 mile upstream from the mouth of Rio Peñasco.

[10]Gage heights and contents only from January 1939 to October 1965. Month-end gage heights from January 1918 to December 1938 in files of Pecos River Commission.

[11]Operated as a low-flow station only. Discharge figures do not include flow, if any, over Lake McMillan Spillway Number 2, which enters the Pecos River downstream from this gage.

[12]Prior to October 1988 operated as a low-flow station only. Records prior to October 1971 not equivalent due to spring inflow between sites.

*Gage heights, or gage heights and discharge measurements only.



EXPLANATION

3965 ▲ GAGING STATION AND ABBREVIATED NUMBER--Complete U.S. Geological Survey number (08396500) identifies station in table 9

Figure 7.--Continuous-record surface-water gaging stations.

Table 10.--Monthly base-flow gain in the Pecos River between the Acme and Artesia streamflow-gaging stations, 1905-89

[Values are in acre-feet. Values for 1957-89 were compiled by the U.S. Geological Survey from data collected by the Pecos River watermaster. Values for 1919-56 were compiled from L.R. Flook, Jr., written commun. (1959). Values for 1905-18 are from National Resources Planning Board (1942, table 31, p. 51)]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1905	23,600	18,400	6,800	3,800	2,100	1,800	2,100	4,100	6,200	8,600	17,900	29,500	124,900
1906	18,900	12,200	4,900	2,900	1,700	1,400	1,600	2,800	4,200	6,700	11,800	19,200	88,300
1907	16,800	11,000	4,700	3,100	1,800	1,400	1,500	2,600	3,800	6,000	10,600	16,900	80,200
1908	8,300	5,300	3,000	2,100	1,100	1,000	900	1,600	2,200	400	6,000	9,400	41,300
1909	13,600	7,800	3,500	1,500	1,200	1,200	1,700	2,600	3,300	3,700	8,900	13,600	62,600
1910	14,100	9,900	5,400	3,800	2,500	1,900	500	2,600	3,800	5,700	9,400	14,100	73,700
1911	14,600	10,400	6,000	4,500	2,900	2,200	1,800	3,100	4,100	5,900	9,700	14,400	79,600
1912	10,700	7,800	4,900	3,800	2,400	1,600	1,800	2,400	2,900	4,500	7,300	10,600	60,700
1913	13,400	10,100	6,600	2,700	2,000	2,200	1,900	900	4,200	5,900	9,300	13,300	72,500
1914	12,700	9,700	6,800	5,400	3,400	2,300	2,000	3,500	3,600	5,800	9,100	12,500	76,800
1915	14,700	11,600	8,100	6,300	5,100	3,200	2,500	3,500	4,700	6,900	10,600	14,300	91,500
1916	10,800	8,700	7,000	6,000	3,600	2,300	2,000	2,700	4,400	5,300	7,900	10,400	71,100
1917	10,200	8,400	5,700	2,800	2,700	1,800	1,900	2,900	3,500	4,400	7,500	9,700	61,500
1918	10,600	9,100	7,900	4,700	1,100	2,100	1,000	3,000	3,900	5,500	8,100	10,100	67,100
1919	8,400	7,400	5,800	5,600	5,200	4,600	5,200	3,900	4,000	8,500	12,000	13,800	84,400
1920	13,400	10,000	7,800	6,100	5,400	4,000	2,500	2,800	3,000	4,400	6,800	9,000	75,200
1921	9,800	7,800	6,700	4,000	3,100	3,400	3,600	3,700	4,000	5,400	7,700	8,300	67,500
1922	8,600	7,500	8,100	4,800	4,100	3,600	3,100	3,400	2,800	2,800	5,400	6,100	60,300
1923	6,400	5,800	5,500	4,200	4,200	2,400	1,500	1,500	2,400	5,400	8,600	9,800	57,700
1924	10,300	8,200	7,000	6,300	6,200	3,700	3,000	4,000	3,500	4,300	5,800	7,700	70,000
1925	8,200	5,400	4,400	2,400	2,600	2,300	1,800	3,200	4,800	7,600	8,600	9,000	60,300
1926	8,700	6,800	7,400	7,800	7,600	4,400	2,700	3,100	4,000	6,400	7,300	8,700	74,900
1927	9,500	7,800	7,300	5,900	3,700	1,600	3,300	3,000	4,000	4,800	4,200	6,000	61,100
1928	7,700	7,600	7,100	4,700	2,600	2,400	2,500	3,800	4,000	5,300	7,700	9,300	64,700
1929	9,600	7,900	8,600	4,300	3,900	2,600	3,900	5,000	5,600	6,400	7,300	7,300	72,400
1930	6,800	4,800	5,400	5,300	5,100	3,900	2,600	4,100	2,100	5,100	8,700	9,200	63,100
1931	9,800	8,500	7,000	4,300	4,500	2,500	3,900	3,000	4,300	6,100	8,200	9,700	71,800
1932	10,200	7,900	8,400	8,100	6,500	5,800	4,700	4,600	4,200	7,400	9,900	10,600	88,300
1933	10,300	8,500	8,100	4,700	3,200	2,600	2,700	2,700	4,000	6,300	6,800	6,800	66,700
1934	6,800	5,900	6,500	6,000	5,100	2,000	500	500	1,100	2,700	3,600	5,400	46,100
1935	6,500	5,200	5,800	5,000	4,400	5,700	2,600	3,000	3,900	4,800	5,200	7,600	59,700
1936	8,100	7,000	7,600	4,500	3,700	2,900	2,500	3,700	2,900	3,600	4,600	6,800	57,900
1937	8,600	8,200	8,700	7,700	6,300	3,900	4,200	4,900	5,300	6,200	7,600	7,300	78,900
1938	6,800	5,900	5,700	4,200	4,400	2,900	2,400	2,000	3,000	5,000	6,600	5,500	54,400
1939	6,800	6,700	5,200	4,200	3,400	1,800	1,200	1,400	1,700	3,100	4,400	6,200	46,100
1940	6,100	5,000	4,400	3,200	3,100	3,100	3,200	1,900	2,200	3,200	5,100	5,900	46,400
1941	5,200	4,900	4,600	4,200	4,100	4,100	5,800	8,500	10,700	13,800	16,500	18,900	101,300
1942	17,200	13,000	11,700	9,000	7,400	5,700	5,200	5,100	7,200	9,100	9,400	10,900	110,900
1943	10,600	7,200	6,700	4,300	3,300	2,600	2,900	2,900	3,000	3,600	5,000	7,700	59,800
1944	9,800	6,900	5,700	4,200	3,300	2,300	3,200	2,500	3,700	6,000	6,600	7,300	61,500

Table 10.--Monthly base-flow gain in the Pecos River between the Acme and Artesia streamflow-gaging stations, 1905-89--Concluded

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1945	6,600	5,500	5,800	3,500	2,900	2,000	3,800	1,700	1,800	4,200	4,800	5,600	48,200
1946	5,900	5,200	5,200	3,500	3,200	1,800	2,300	1,500	1,800	5,200	7,300	8,800	51,700
1947	7,600	5,000	4,100	2,900	3,100	2,300	1,400	1,900	2,200	2,000	4,500	6,000	43,000
1948	4,900	4,800	4,800	2,700	2,900	2,900	2,500	1,300	2,700	3,100	4,700	5,600	42,900
1949	5,900	5,500	3,700	2,500	2,700	2,400	3,000	2,600	3,000	4,600	6,400	7,400	49,700
1950	5,800	4,000	2,500	2,700	3,100	2,000	2,300	2,700	1,900	3,200	4,600	4,800	39,600
1951	4,500	3,900	3,700	3,200	2,600	2,200	1,700	2,100	2,100	1,800	3,900	5,300	37,000
1952	4,700	3,600	3,100	3,600	3,200	1,600	1,100	2,100	2,500	1,700	3,300	3,800	34,300
1953	3,600	3,800	2,400	3,200	2,900	2,200	1,000	1,100	2,500	1,900	3,200	3,800	31,600
1954	3,500	3,400	3,500	2,300	2,300	2,300	1,600	1,400	2,100	6,200	8,400	6,500	43,500
1955	5,500	4,400	3,300	3,000	2,300	1,900	1,400	1,600	1,600	3,400	4,200	5,400	38,000
1956	4,000	3,900	3,300	3,400	2,900	1,400	1,200	1,200	2,700	2,000	2,400	3,600	32,000
1957	3,740	2,980	3,120	3,300	3,010	2,010	1,360	1,540	1,410	1,830	3,560	3,970	31,830
1958	3,860	3,430	3,490	3,060	2,700	1,890	1,700	1,740	2,740	3,940	4,320	3,770	36,640
1959	3,270	2,950	3,980	3,130	2,740	2,240	1,880	1,340	790	1,330	2,310	3,000	28,960
1960	4,150	3,440	2,850	2,280	1,980	1,700	1,720	1,610	1,740	2,980	4,060	5,470	33,980
1961	5,490	3,790	4,200	3,430	1,750	1,990	1,970	1,600	1,390	1,460	2,730	3,670	33,470
1962	3,330	2,920	2,260	2,080	1,870	1,380	1,290	1,080	1,200	2,800	3,130	3,070	26,410
1963	3,220	2,860	2,820	2,000	1,930	1,230	930	910	960	1,150	2,150	2,620	22,780
1964	2,420	2,390	2,240	1,420	1,150	760	520	280	270	550	1,190	2,060	15,250
1965	2,030	1,700	1,640	1,270	1,150	920	750	910	1,060	780	1,700	2,420	16,330
1966	2,540	2,240	1,980	1,770	1,660	1,090	670	880	1,390	1,940	2,340	2,090	20,590
1967	2,620	2,280	1,920	1,240	1,040	1,070	810	670	850	780	1,340	2,000	16,620
1968	2,540	2,640	2,210	1,460	1,190	810	950	1,130	1,010	950	1,730	2,310	18,930
1969	2,340	1,850	1,910	1,800	1,720	1,300	880	780	1,130	1,640	2,240	3,120	20,710
1970	3,150	2,120	1,950	1,340	1,030	1,040	1,120	1,060	1,090	1,610	1,670	2,030	19,210
1971	2,280	1,830	1,660	910	880	750	390	660	1,060	1,360	2,040	2,250	16,070
1972	2,210	1,690	1,280	940	920	810	820	1,090	1,280	1,700	2,390	3,040	18,170
1973	3,040	2,220	2,070	1,490	1,330	1,090	890	690	750	890	1,340	1,770	17,570
1974	2,180	1,360	1,220	1,010	600	450	570	780	1,340	3,520	4,590	4,470	22,090
1975	3,610	2,800	2,730	1,720	1,240	920	880	780	970	980	1,830	2,090	20,550
1976	2,240	1,830	1,100	880	850	760	790	870	1,100	1,190	2,030	2,340	15,980
1977	2,240	1,650	1,420	980	870	680	570	670	950	1,610	2,120	2,090	15,850
1978	2,310	2,000	1,510	820	1,060	980	940	890	950	1,770	2,690	3,970	19,890
1979	4,750	3,470	3,270	1,370	1,010	1,210	1,540	1,510	1,040	1,300	1,740	2,490	24,700
1980	2,590	2,140	2,100	1,280	1,190	950	810	990	1,100	1,810	2,180	2,350	19,490
1981	2,270	2,150	1,740	1,190	920	760	850	1,190	1,740	2,230	2,520	2,820	20,380
1982	2,820	2,730	2,150	1,440	1,530	1,110	770	770	880	1,300	1,650	2,360	19,510
1983	2,640	2,110	1,660	1,250	1,110	710	610	610	890	1,480	1,960	2,520	17,550
1984	2,580	1,720	1,780	1,310	1,050	1,010	1,050	984	1,250	2,460	3,030	3,070	21,294
1985	3,140	2,550	2,090	1,960	1,780	1,190	1,290	1,290	1,670	2,030	2,920	2,950	24,860
1986	2,770	2,280	2,280	1,490	1,480	2,020	2,090	2,090	3,035	3,689	3,689	3,997	30,910
1987	4,120	3,780	4,060	3,690	3,630	3,090	2,150	1,110	1,010	2,030	3,210	4,180	36,060
1988	4,670	3,800	3,010	1,790	1,540	1,610	1,780	2,030	2,020	2,340	2,500	2,640	29,730
1989	2,640	2,390	2,520	1,730	1,600	1,370	922	676	833	1,290	1,790	2,030	19,791

Table 11.--Surface-water-quality sites in the vicinity of the Roswell Basin and number of water analyses listed in the National Water Information System

[Station number: identifying number in the National Water Information System data base. Station name: station name in the National Water Information System data base. Latitude-Longitude: location of the station, in degrees, minutes, and seconds north latitude followed by degrees, minutes, and seconds west longitude. --, no analyses]

Station number	Station name	Latitude-Longitude	Number of analyses		
			Physical	Chemical	Biological
08385950	Pecos River at Bob Crosby Bridge near Acme	333410 1042220	--	17	--
08386000	Pecos River near Acme	333210 1042234	220	183	1
08386010	Pecos River at pipeline crossing	333113 1042318	1	1	--
08386020	Pecos River above Bitter Lakes	333003 1042318	1	1	--
08386030	Pecos River at Bitter Lakes	332718 1042241	1	1	--
08386050	Pecos River above mouth of Bitter Creek	332434 1042354	2	2	--
08386060	Bitter Creek 0.9 mile above mouth	332458 1042434	1	1	--
08386062	Bitter Creek at mouth	332431 1042354	1	1	--
08386063	Pecos River below Bitter Creek	332430 1042318	1	1	--
08386070	Pecos River at Tatum Bridge near Roswell	332350 1042340	11	2	--
08386090	Pecos River above Rio Hondo	332221 1042356	2	2	--
08387000	Rio Ruidoso at Hollywood	331936 1053738	361	78	19
08387600	Eagle Creek below South Fork near Alto	332333 1054316	133	133	--
08387800	Eagle Creek near Alto	332329 1053639	39	39	--
08390500	Rio Hondo at Diamond A Ranch near Roswell	332057 1045105	162	6	--
08390800	Rio Hondo below Diamond A Dam near Roswell	331805 1044312	103	103	--
08393200	Rocky Arroyo above Two Rivers Reservoir near Roswell	331707 1044747	13	13	--
08393300	Rocky Arroyo below Rocky Dam	331558 1044206	37	37	--
08393600	North Spring River at Roswell	332347 1043253	18	18	--
08393800	Hagerman Canal at Dexter	331214 1042337	21	21	--
08393930	Hagerman Canal at head	332346 1042627	1	1	--

Table 11.--Surface-water-quality sites in the vicinity of the Roswell Basin and number of water analyses listed in the National Water Information System--Continued

Station number	Station name	Latitude-Longitude	Number of analyses		
			Physical	Chemical	Biological
08393935	Roswell Drainage District "X" line at entrance to Hagerman	332321 1042538	1	1	–
08393940	South Spring Creek	332202 1042458	1	1	–
08393945	Pamona Drain at entrance to Hagerman Canal	332101 1042339	1	1	–
08393970	Rio Hondo at U.S. Highway 380 Bridge	332351 1042521	1	1	–
08393980	South Spring Drain	332202 1042459	1	1	–
08393990	Rio Hondo at mouth	332220 1042357	1	1	–
08394005	East Grand Plains Drainage District "D" line at mouth	332151 1042327	1	1	–
08394010	East Grand Plains Drainage District "A-B-C" line at mouth	332139 1042315	1	1	–
08394015	Gravel Pit Drain at mouth	332130 1042201	1	1	–
08394020	Pecos River below Gravel Pit Drain	332112 1042128	1	1	–
08394025	Pecos River below Oasis Miller Drain	331851 1042133	1	1	–
08394030	Pecos River at Transwestern pipeline crossing	331656 1042122	1	1	–
08394040	Pecos River above Nine Mile Draw	331444 1042117	1	1	–
08394050	Nine Mile Draw at mouth	331432 1042115	1	1	–
08394060	Pecos River below Nine Mile Draw	331411 1042105	1	1	–
08394070	Zuber Hollow Wasteway at mouth	331246 1042011	1	1	–
08394080	Pecos River above Dexter Bridge	331233 1042007	4	4	–
08394090	Pecos River above Berry Drain	331125 1041857	1	1	–
08394100	Pecos River near Hagerman	331008 1041824	233	233	–
08394110	Pecos River above Rio Felix	330855 1041855	1	1	–
08394500	Rio Felix at old highway bridge near Hagerman	330730 1042040	51	51	–
08395010	Rio Felix three-fourths mile above mouth	330730 1042040	1	1	–
08395020	Pecos River below Rio Felix	330758 1041841	1	1	–
08395030	Pecos River at Hagerman Bridge	330717 1041703	6	6	–

Table 11.--Surface-water-quality sites in the vicinity of the Roswell Basin and number of water analyses listed in the National Water Information System--Continued

Station number	Station name	Latitude-Longitude	Number of analyses		
			Physical	Chemical	Biological
08395040	Pecos River above Hagerman District "A" line	330546 1041729	1	1	--
08395050	Pecos River below Lathrop Pump, near Hagerman	330448 1041731	1	1	--
08395060	Pecos River below Pritchard Lakes	330410 1041753	2	2	--
08395070	Pecos River above Buffalo Valley Pump	330308 1041633	1	1	--
08395080	Steve Mason Drain at mouth	330051 1041651	1	1	--
08395090	Pecos River above Lake Arthur	330041 1041724	1	1	--
08395500	Pecos River near Lake Arthur	325918 1041920	570	568	--
08395570	Pecos River at Eddy-Chaves County line	325754 1042112	2	2	--
08395590	Pecos River above Cottonwood Creek	325347 1042115	1	1	--
08396010	Cottonwood Creek at mouth	325314 1042114	1	1	--
08396030	Pecos River above Artesia sewage	325125 1042029	1	1	--
08396500	Pecos River near Artesia	325025 1041923	704	636	99
08396510	Pecos River (Kaiser Channel) above gaging station	324541 1041858	1	1	--
08397405	Aqua Chiquita Creek near Weed	324803 1052829	4	4	--
08398500	Rio Peñasco at Dayton	324436 1042449	36	30	--
08399500	Pecos River (Kaiser Channel) near Lakewood	324122 1041753	495	492	--
08399510	Pecos River above Lake McMillan	323918 1041840	1	1	--
08400000	Fourmile Draw near Lakewood	324020 1042207	17	17	--
08400500	Lake McMillan near Lakewood	323542 1042049	133	136	--
08401000	Pecos River below McMillan Dam	323540 1042059	162	162	--
08401100	Pecos River above Seven Rivers near Lakewood	323443 1042242	36	36	--
08401200	South Seven Rivers near Lakewood	323519 1042517	17	17	--
08401300	Pecos River at Ford Crossing above Major Johnson Springs	323440 1042318	66	66	--
08401500	Pecos River below Brantley Dam near Carlsbad	323238 1042200	178	179	--
321443104414010	Sitting Bull Spring below Falls (24S.22E.3.213)	321443 1044140	1	1	--

Table 11.--Surface-water-quality sites in the vicinity of the Roswell Basin and number of water analyses listed in the National Water Information System--Concluded

Station number	Station name	Latitude-Longitude	Number of analyses		
			Physical	Chemical	Biological
324803105282910	Aqua Chiquita Creek near Weed	324803 1052829	3	3	--
325026104192310	Pipe leak above Pecos River near Artesia	325026 1041923	1	1	--
331813104201510	Bottomless Lakes overflow (12S.26E.4.410)	331813 1042015	1	1	--
331814104444210	Hondo River	331814 1044442	1	1	--
332209105415310	Cedar Creek, South Fork, 3 miles northwest of Ruidoso	332209 1054153	1	1	--
332332105432610	South fork of Eagle Creek at 2.6 miles west of Alto	332332 1054326	1	1	--
332511105422410	Little creek at gravel pit, 1 mile east of Villa Madonna	332511 1054224	1	1	--
332750105350010	Bonito Creek at picnic area	332750 1053500	1	1	--
332935105225701	9S.16E.28.332	332935 1052257	3	3	--
333012105295610	Rio Bonito, site 1a (9S.15E.20.341)	333012 1052956	1	1	--
333016105380510	Magado Creek, 4 miles southwest of Capitan near Highway 48	333016 1053805	1	1	--
333030105293601	Fort Stanton Cave (9S.15E.20)	333030 1052936	1	1	--
333058105373910	Magado Creek tributary, 3 miles southwest of Capitan near Highway 48	333058 1053739	1	1	--
333118105282901	9S.15E.16.441	333118 1052829	3	3	--
333204105352401	9S.14E.17.222	333204 1053524	3	3	--
334803105282901	08397405 Agua Chiquita at bridge near Weed	334803 1052829	2	2	--
334803105282910	08397405 Agua Chiquita C near Weed	334803 1052829	1	1	--
335528104184001	South Spring River (4S.25E.28.444)	335528 1041840	1	1	--
335618104112701	Hernandez Lake (4S.26E.23)	335618 1041127	1	1	--
335851104102701	Salt Lake (4S.26E.2)	335851 1041027	1	1	--

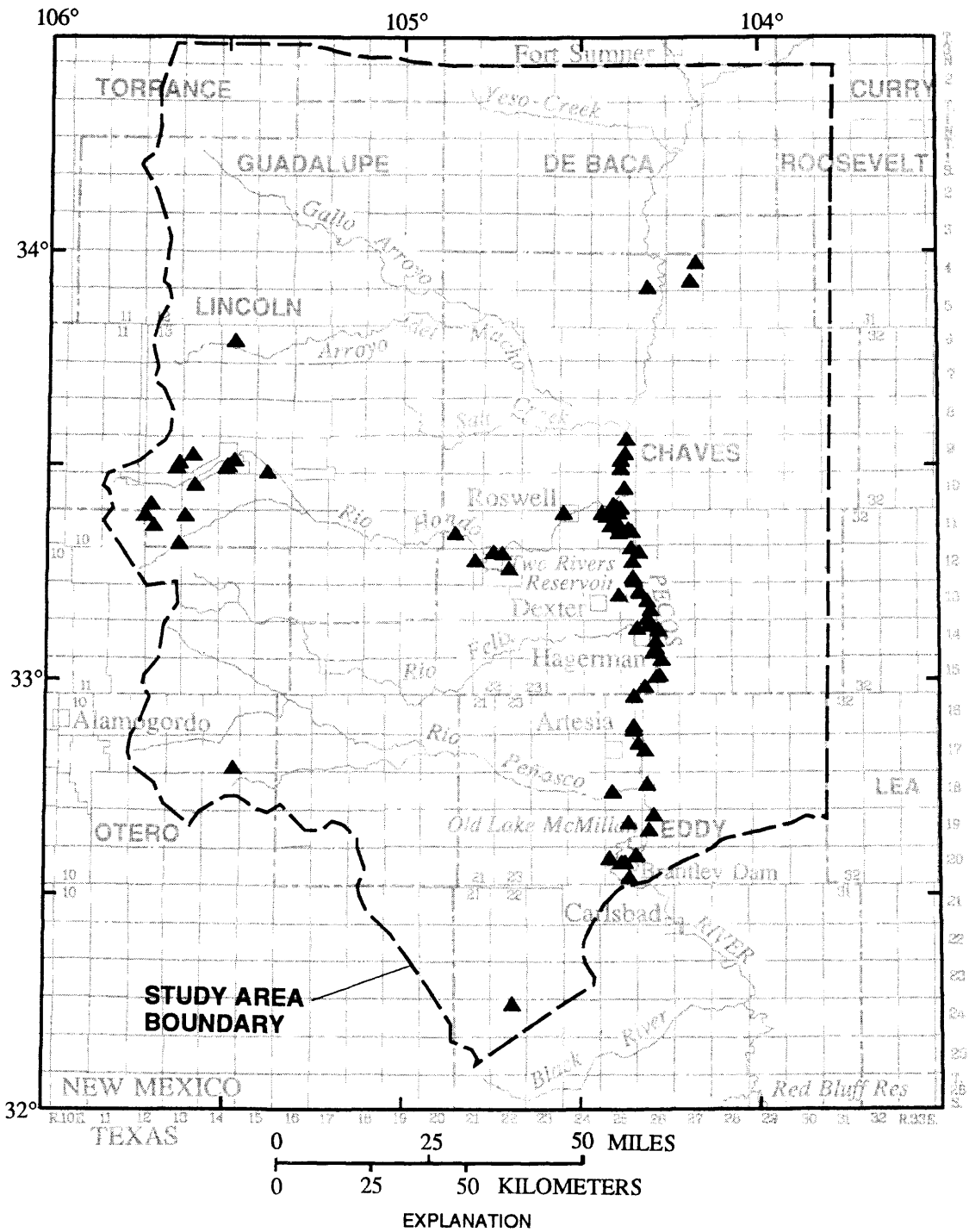


Figure 8.--Surface-water sites for which water-quality information is available in the National Water Information System.

Table 12.--Monthly withdrawal from the Pecos River between the Acme and Artesia streamflow-gaging stations, 1907-89

[Values are in acre-feet. Values for 1957-89 were compiled by the U.S. Geological Survey from data collected by the Pecos River watermaster. Values for 1919-56 were compiled from L.R. Flook, Jr., written commun. (1959). Values for 1907-18 are from National Resources Planning Board (1942, table 38, p. 55) and are for the Roswell to Artesia reach of the Pecos River]

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1907	0	0	0	100	0	0	100	100	100	0	0	0	400
1908	0	0	100	100	100	100	200	100	100	0	0	0	800
1909	0	0	100	200	100	100	200	200	200	100	0	0	1,200
1910	0	0	200	200	100	200	300	200	200	100	100	0	1,600
1911	0	0	200	300	200	200	300	300	300	100	100	0	2,000
1912	0	0	300	400	200	300	400	300	300	100	100	0	2,400
1913	0	0	300	400	300	300	500	400	400	100	100	0	2,800
1914	0	0	400	500	300	400	500	500	400	100	100	0	3,200
1915	0	0	500	500	300	400	600	500	500	200	100	0	3,600
1916	0	0	500	600	300	500	700	600	500	200	100	0	4,000
1917	0	100	500	700	400	500	700	600	600	200	100	0	4,400
1918	0	100	600	700	400	600	800	700	600	200	100	0	4,800
1919	40	90	340	760	380	420	590	680	590	170	130	40	4,230
1920	50	100	390	870	440	490	680	780	680	180	150	50	4,860
1921	60	120	470	1,040	530	580	820	940	820	230	180	60	5,850
1922	100	210	830	1,860	930	1,040	1,450	1,660	1,450	410	310	100	10,350
1923	50	110	430	970	490	540	760	870	760	220	160	50	5,410
1924	130	260	1,020	2,300	1,150	1,280	1,790	2,040	1,790	510	380	130	12,780
1925	60	130	500	1,130	560	630	880	1,000	880	250	190	60	6,270
1926	60	120	500	1,100	550	610	850	980	850	240	180	60	6,100
1927	110	210	850	1,920	960	1,070	1,500	1,710	1,500	430	320	110	10,690
1928	60	130	530	1,190	590	660	920	1,050	920	260	200	70	6,580
1929	90	170	690	1,550	780	860	1,210	1,380	1,210	340	260	90	8,630
1930	110	230	900	2,030	1,020	1,130	1,580	1,800	1,580	450	340	110	11,280
1931	90	180	740	1,670	830	920	1,290	1,470	1,290	370	280	90	9,220
1932	70	150	600	1,360	680	750	1,050	1,200	1,050	300	230	80	7,520
1933	140	280	1,110	2,520	1,250	1,400	1,950	2,240	1,950	560	420	140	13,960
1934	170	340	1,360	3,060	1,530	1,700	2,390	2,720	2,390	680	510	170	17,020
1935	130	250	1,010	2,270	1,130	1,260	1,760	2,020	1,760	500	380	130	12,600
1936	110	230	900	2,030	1,020	1,130	1,570	1,800	1,570	450	340	110	11,260
1937	120	230	930	2,060	1,040	1,160	1,630	1,850	1,630	460	350	120	11,580
1938	140	270	1,100	2,460	1,230	1,370	1,910	2,190	1,910	550	410	140	13,680
1939	150	290	1,170	2,630	1,320	1,460	2,050	2,340	2,050	590	440	150	14,640
1940	140	280	1,110	2,520	1,250	1,400	1,940	2,240	1,940	560	420	140	13,940
1941	110	220	890	2,000	1,000	1,110	1,550	1,780	1,560	440	330	110	11,100
1942	120	240	960	2,160	1,080	1,200	1,670	1,920	1,670	480	360	120	11,980
1943	190	370	1,500	3,390	1,690	1,880	2,620	3,000	2,620	750	560	190	18,760
1944	110	230	920	2,060	1,030	1,140	1,600	1,830	1,600	460	340	110	11,430
1945	180	360	1,430	3,240	1,620	1,800	2,510	2,870	2,510	720	540	180	17,960
1946	130	260	1,040	2,350	1,170	1,300	1,820	2,080	1,830	520	390	130	13,020

Table 12.--Monthly withdrawal from the Pecos River between the Acme and Artesia streamflow-gaging stations, 1907-89--Concluded

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1947	210	420	1,670	3,740	1,880	2,080	2,910	3,340	2,910	830	630	210	20,830
1948	180	350	1,410	3,180	1,590	1,770	2,470	2,820	2,470	710	530	180	17,660
1949	130	270	1,070	2,410	1,200	1,340	1,880	2,140	1,880	540	400	130	13,390
1950	130	260	1,040	2,340	1,170	1,300	1,820	2,080	1,820	520	390	130	13,000
1951	240	480	1,930	4,350	2,180	2,420	3,380	3,870	3,380	970	730	240	24,170
1952	230	470	1,870	4,200	2,100	2,330	3,260	3,730	3,270	930	700	230	23,320
1953	230	470	1,860	4,190	2,090	2,330	3,260	3,720	3,260	930	700	230	23,270
1954	220	430	1,730	3,880	1,940	2,160	3,020	3,450	3,020	860	650	220	21,580
1955	190	380	1,520	3,430	1,710	1,900	2,670	3,050	2,670	760	570	190	19,040
1956	270	530	2,120	4,760	2,380	2,640	3,700	4,230	3,700	1,060	790	270	26,450
1957	229	465	2,145	1,955	1,934	1,992	2,466	2,733	1,858	252	3	146	16,178
1958	11	29	1,841	1,942	2,093	2,873	2,872	3,144	1,145	19	10	66	16,045
1959	82	588	2,143	2,512	1,834	2,727	3,025	3,720	1,876	382	342	168	19,399
1960	47	251	1,661	2,843	2,345	1,996	2,099	3,046	1,625	340	32	62	16,347
1961	4	118	1,808	2,382	2,249	2,561	2,830	3,112	1,586	457	222	5	17,334
1962	2	348	2,370	1,757	1,428	2,061	1,652	1,656	1,652	168	275	38	13,407
1963	44	259	2,892	1,722	1,400	1,896	2,612	3,058	1,572	542	142	31	16,170
1964	229	303	914	2,913	774	633	2,634	405	597	528	535	239	10,704
1965	12	240	2,125	1,467	1,357	1,741	1,923	1,598	1,287	194	223	14	12,181
1966	0	28	2,615	1,238	841	1,682	1,719	1,700	1,143	589	301	582	12,438
1967	346	185	1,045	742	2,837	1,378	1,594	2,461	891	385	214	201	12,279
1968	5	0	1,805	1,888	857	2,161	1,151	1,728	1,253	501	304	49	11,702
1969	76	204	2,225	1,778	937	2,519	2,360	2,294	718	635	19	0	13,765
1970	18	229	1,371	1,927	1,246	2,581	2,044	2,954	1,297	263	554	184	14,668
1971	105	734	1,231	2,703	3,072	1,164	445	2,078	1,349	402	448	10	13,741
1972	14	293	1,372	3,647	1,239	1,253	2,181	2,160	501	596	4	0	13,260
1973	1	8	966	1,716	1,742	2,848	1,932	1,888	1,342	495	107	150	13,195
1974	84	478	1,965	2,297	2,028	1,986	2,180	886	260	124	0	8	12,296
1975	25	214	627	584	684	2,542	1,239	1,344	996	374	109	250	8,988
1976	257	144	2,606	1,464	1,111	1,027	2,207	2,006	513	304	48	20	11,707
1977	73	225	1,892	1,652	1,141	582	1,983	926	1,331	362	55	43	10,265
1978	8	19	1,442	3,085	986	982	2,356	1,014	553	55	8	7	10,515
1979	1	90	857	981	1,136	2,335	2,247	1,143	1,370	581	69	1	10,811
1980	10	1	481	2,706	1,166	1,818	3,088	1,731	330	6	55	2	11,394
1981	32	375	999	696	1,138	2,821	1,424	918	348	67	126	6	8,950
1982	13	162	395	2,297	1,267	720	2,395	1,064	1,060	221	111	0	9,705
1983	0	31	243	532	2,021	1,089	2,599	1,581	1,873	207	0	9	10,185
1984	21	223	893	1,133	2,460	1,565	1,504	1,092	1,254	271	1	6	10,423
1985	0	68	599	1,064	1,452	1,178	1,569	1,772	404	56	47	6	8,215
1986	30	7	292	1,201	2,510	604	507	1,349	345	47	1	0	6,893
1987	0	61	735	1,418	552	748	1,653	806	1,510	468	169	43	8,163
1988	0	9	510	1,066	1,405	1,717	1,504	2,153	1,490	444	125	33	10,456
1989	408	268	514	2,141	1,680	2,175	963	558	1,303	901	294	173	11,378

Irrigated Acreage

Information on irrigated acreage in the basin is available from several sources. Total acreage irrigated in 1925 was provided by Fiedler and Nye (1933, p. 255) and that irrigated in 1925 and 1938-57 was provided by Mower (1960, table 7, p. 47). The acreage irrigated in Chaves County in 1923-27 was provided by Fiedler and Nye (1933, p. 255). Total acreage irrigated from the lower aquifer was reported for 1935-37 by McMains and Hill (1942, table 56, p. 141), and for 1925 and 1935-37 by the National Resources Planning Board (1942, table 72, p. 91). Acreage irrigated from the upper aquifer was reported for 1927-38 by McMains and Hill (1942, table 57, p. 142) and by the National Resources Planning Board (1942, table 72, p. 91). Irrigated acreage listed by counties and by river basins in New Mexico was provided by Sorensen (1977, 1982) and Wilson (1986; 1992). Fiedler and Nye (1933, pl. 45) provided a map of the irrigated area in the Roswell Basin for 1926-27. Mower (1960, fig. 5) provided a map of irrigated acreage in the Roswell Basin for 1955. Mower's map was compiled from the more detailed maps in the 1955 Roswell Basin Hydrographic Survey (New Mexico State Engineer, 1955). Areal photographs showing irrigated acreage in the Roswell Basin are available for 1946 and 1950 (unpublished maps, 1946, 1950, New Mexico State Engineer Office, Santa Fe). Detailed information on irrigated acreage in the vicinity of the Roswell Basin is available from the following hydrographic survey reports: New Mexico State Engineer, 1922, 1932, 1933, 1937, 1955, 1972, 1975a, 1975b, 1979, 1982.

Crop Types

Crop distributions listed by county have been compiled annually (beginning in 1961) by the New Mexico Crop and Livestock Reporting Service (1962-91). Crop distributions in Chaves County for 1923-27 were reported by Fiedler and Nye (1933, p. 255).

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SUPPLEMENTAL INFORMATION

Well- and Spring-Numbering System

The system of numbering wells and springs in this report is based on the common subdivisions in sectionized land. The number, in addition to designating the well or spring, locates its position in the land net (fig. 9).

The number consists of four parts separated by periods. The first part is the township number north (N) or south (S) of the New Mexico Base Line, the second part is the range number east (E) or west (W) of the New Mexico Principal Meridian, and the third part is the section (sec.) number. The fourth part of the number consists of one to three digits designating the 160-, 40-, and 10-acre tract in which the well or spring is located within the section.

The method of numbering the tracts within a section is shown in figure 9. For this purpose the section is divided into four quarters, numbered 1, 2, 3, and 4, in the normal reading order, for the northwest, northeast, southwest, and southeast quarters, respectively. The first digit of the fourth part gives the quarter section, which is a tract of 160 acres. Each quarter is subdivided in the same manner so that the first and second digits together define the 40-acre tract. Finally, the 40-acre tract is divided into four 10-acre tracts. The third digit defines the 10-acre tract. Thus, well 11 S. 25 E. 14.332 is located in the NE1/4 of the SW1/4 of the SW1/4 of sec. 14, T. 11 S., R. 25 E. If a well or spring is not located accurately within a section, the fourth part of the well number is not given. If a well or spring is not located accurately within a 10-acre tract, a zero is used as the third digit, and if it is not located within a 40-acre tract, zeros are used for both the second and third digits.

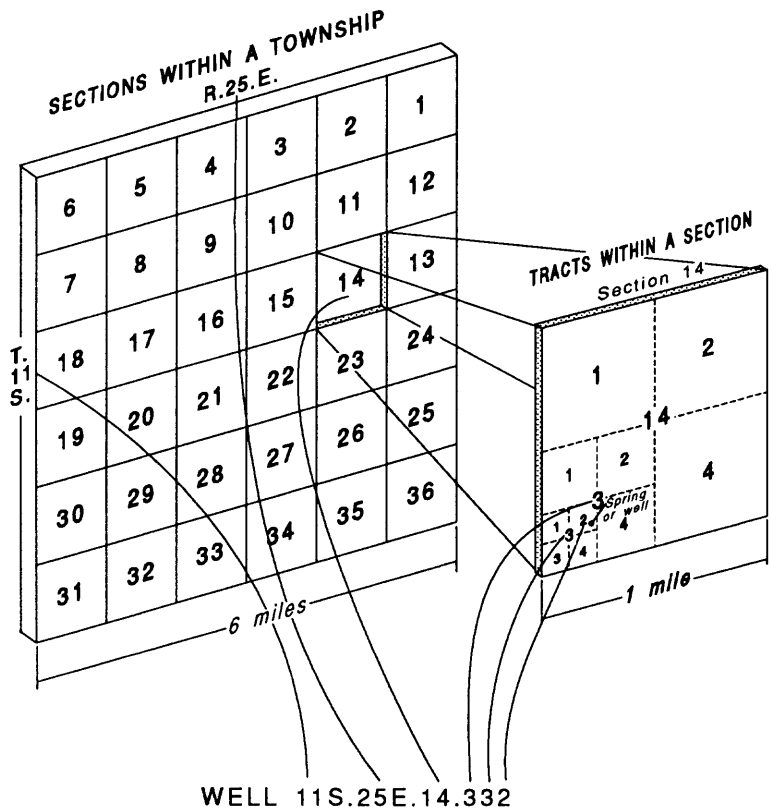

Figure 9.--System of numbering wells and springs in New Mexico.

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