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CIRCULAR 26

WATER WELL RECORDS AND WELL WATER QUALITY

IN

SOUTHWESTERN SAN AGUSTIN PLAINS
CATRON COUNTY, NEW MEXICO

By

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WATER WELL RECORDS AND WELL WATER QUALITY

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SOUTHWESTERN SAN AGUSTIN PLAINS

CATRON COUNTY, N. M.

Introduction and Purpose

A study of the ground water resources of the southwestern part of the San Agustin Plains in Catron County is currently in progress. This area is included in the Pelona NE and NW quadrangles which are being mapped geologically by Dr. Charles Stearns, of Harvard University. The data on wells and water supply have been secured by the authors of this circular as a part of this study and are released for such purposes as they may serve in advance of the geological report which should aid greatly in the understanding of problems of water supply of this area.

Discussion

Data on water wells and springs in the Pelona NE and Pelona NW quadrangles are presented in this circular. This area of about 500 square miles lies between the parallels $33^{\circ} 45'$ and $34^{\circ} 00'$ N. latitude and between the meridians $108^{\circ} 00'$ and $108^{\circ} 30'$ W. longitude, and includes the southwestern end of the Plains of San Agustin and the adjoining hills and mountains. It is located along the highway from Datil to Reserve and includes all or parts of Townships 4, 5, and 6S., Ranges 11, 12, 13, 14, 15, and 16W. in Catron County.

An attempt was made to inventory all wells within the area though it is possible that a few may have been overlooked. Several wells outside the quadrangles have been included in the tables. In compiling the information summarized in the tables, an effort was made to contact all well owners and as many drillers as possible for well data. Permission was granted by most well owners to measure water levels and to collect water samples for chemical analyses.

The base map, taken from the State Highway map of Catron County, shows highways and roads, corrected to the spring of 1953. Elevations of ground surfaces at well sites as given in Table 1 were estimated from the topographic map of the Pelona quadrangle published by the U. S. Geological Survey in 1918. The Contour interval on this map is 100 feet. Elevations for those wells within the plains were estimated from a map on which 10-foot contours are shown, published in the JOURNAL OF GEOLOGY for December 1939, included in Powers' report, Basin and Shore Features of the Extinct Lake San Augustin, N. Mex.

Well Numbering

All wells and springs for which records are included are located on the map. The well numbering system is that used by the U. S. Geological Survey Ground Water Branch in New Mexico and is based on the common units of the township-range system. The well number serves to identify and locate the well in the nearest 10-acre plot. The number is divided by periods into 4 segments. The first segment indicates the township, the next indicates the range, the third segment indicates the section, and the fourth, or right-hand part locates the well within the section.

Each section is divided into quarters numbered in reading order: the NW quarter number 1, the NE quarter number 2, the SW quarter number 3, and the SE quarter number 4. The quarter section is again divided into quarters and numbered in the same order. The quarter-quarters are also similarly subdivided and numbered. This locates a well to the nearest 10-acre tract. In the well number the first digit of the fourth segment locates the quarter section, the second digit the quarter-quarter, and the last digit the 10-acre tract. Where more than one well is located in any tract, the number is followed by a, b, c, etc. Where a location cannot be established to a 10-acre plot, the indefinite subdivisions are replaced with zeros in the well number, as for example, where a well is known to be in the NW quarter, but cannot be located with reference to smaller subdivisions, the number would end .100. As an illustration, well 4.13.27.314 is located in the SE quarter NW quarter SW quarter Section 27, Township 4S., Range 13W.

Quality of Water.

During the course of the investigation, 66 water samples were collected for chemical analysis. Fifty-seven of the samples were collected from wells and nine were collected from springs. The laboratory work was performed by the Quality of Water Branch of the U. S. Geological Survey at Albuquerque, New Mexico. The concentrations of the mineral constituents of ground water, obtained by solution from the rock through which the water passes, are dependent upon the solubility of the soil and minerals and the time the water was in contact with them. Mineral ions present in high concentration may effect its value for certain uses.

The mineral materials in solution will be discussed in the order in which they appear in Table 3. Silica, present in all ground waters, is usually in concentrations below 70 ppm. and under such conditions does not affect its use for stock, irrigation, or domestic purposes.

The alkalis, sodium and potassium, are reported together. In concentrations above 300 ppm. sodium imparts a taste to water. L. V. Wilcox in Circular No. 784, U. S. Dept. of Agriculture, 1948, states that "the percentage of sodium...is important, because waters of high sodium percentage so react with the soil that it becomes difficult to till and is hard when dry, sticky when wet, and 'takes water' very slowly." Circular 784 also contains a graph showing the relationship of percent sodium and specific conductivity (an indicator of dissolved solids) to suitability for irrigation. Carbonates and bicarbonates are present in low concentrations in these waters and as such may affect only domestic use, such as formation of scale in kitchen utensils. Sulfate has no effect on use of the water at the low concentrations reported for these waters. High sulfate waters have a noticeable taste and may have a laxative effect on persons having a low sulfate tolerance.

Chlorides such as found in sodium chloride, or common table salt, are in low concentrations also and not sufficiently high except in one or two of the waters to have any effect. Fluorides are present in nearly all the waters in this area. According to publications of the American Water Works Association and the U. S. Public Health Service, in concentrations above 1.5 ppm. fluorides will result in mottling of enamel in teeth of growing children, and below 1.0 ppm. should result in the formation of durable enamel. Water having concentrations greater than 44 ppm. nitrate has been reported in publications of the American Water Works Association to have been excessive for human consumption in some cases, especially for very young children.

Hardness is the property of water which most affects its use for cleansing purposes, being a direct measure of the soap requirements. Hardness is reported in terms of ppm. of CaCO_3 , and may be computed from the calcium and magnesium concentrations. Waters in this area range from soft (less than 60 ppm.) to hard (more than 200 ppm.).

The specific conductance is a measure of the ability of a water to conduct an electric current, dependent upon the concentrations and solubilities of the various minerals, and is, therefore, a relative indicator of the total dissolved solids in the water.

TABLE 1, RECORDS OF WELLS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO

Location number	Owner	Date completed	Topographic situation	Altitude above sea level (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Water level		Meth. of lift	Pumping rate		Use	Remarks
								Below ground surface (feet)	Date of measurement		GP ² '	Date of measurement		
3.11.28.230*	Ted Powell	1950	Edge of plains		Dr.	220	6	184	Reported	W			S	
3.11.31.100*	Rudder							120.1	1-28-53	W			D	Tape stopped at 134'
3.11.35.311*	Ted Powell		S. A. Plains		Dr.	500	6	160.9	1-28-53	W	4½	1-28-53	S	
3.11.31.300	Ted Powell	1910	Mouth of draw	6975	Dr.	100	5½	27.3	12-11-52	W	2	12-11-52	D,S	Driller: Pat McDough
3.12.33.433	J. B. Conner		Mtn. Canyon	7800	Du	42		40	Reported	W			D,S	Abandoned, moved house
3.12.33.434	J. B. Conner	1940	do	7750	Dr.	57	6	33	Reported	W			D,S	Drilled by Conners
3.12.33.444	J. B. Conner		do	7670	Du	8				W			I	Almost dry
4.11.6.140	Ted Powell	1951	Edge of S.A. Plains	6950	Dr.	250	6	195	Reported	W	1	12-11-52	S	Driller: Fred Salisbury
4.11.8.122	Odell Emery	--	S. A. Plains	6935	Dr.	230	6	200	12-17-52	W			S	Slab marked Pancho Nov.2,1945
4.11.17.333	Odell Emery	1950	S. A. Plains	6925	Dr.	230	6	168.2	12-17-52	W	1	12-17-52	S	Driller: Fred Salisbury
4.12.3.220	Ira McKinley		Mtn. Canyon	7475	Dr.	160		148.2	1-28-53	W	20	Reported	S	
4.12.12.410	Laureano Sanchez	1910	Edge of plains	6935	Dr.	240	6			W	2-4	12-17-52	D,S	
4.12.12.420	O. Emery	1910	Edge of plains	6935	Dr.	214	5½	195	12-17-52	W	1	12-17-52	D,S	A little salty

*well outside of Pelona quadrangle
 Explanation at end of table

TABLE 1, RECORDS OF WELLS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO, (Continued)

Location number	Owner	Date completed	Topographic situation	Altitude above sea level (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Water level			Pumping rate		Use	Remarks
								Below ground surface (feet)	Date of measurement	Meth. of lift	GPM	Date of measurement		
4.12.15.420	L. Sanchez	1948	Edge of plains	6930	Dr.	206	5	155	12-17-52	W	1.5	12-17-52	S	Driller: Red Guin
4.12.22.300	D. Gutierrez		do	6900	Dr.	152		133.4	12-11-52	W			S	
4.12.24.122	H.B. Birmingham, Jr. James well		S. A. Plains	6920	Dr.		6	173	1-28-52	W	2	12-11-52	S	
4.12.30.420	T. Gutierrez		Edge of plains	6840	Dr.	160	6	78.3	12-11-52	W	3	12-11-52	D,S	
4.12.31.310	J. Apodaca		S. A. Plains	6835	Dr.	160	6	70.2	12-11-52	W	4	12-11-52	S	Driller: S. C. Christianson
4.12.31.400	D. Gutierrez		do	6835	Dr.	160	6	73	12-11-52	G			S	
4.12.34.230	H.B. Birmingham, Jr.		do	6885	Dr.	148				W			S	
4.13.17.430	H. Price		Draw in hills	7200	Dr.	139	6	115.6	12-12-52	W			N	Abandoned, not enough water
4.13.20.330	H. Price (?)		Shallow draw	7125	Dr.	64	6	55.7	12-18-52	W			S	Abandoned. Dry dug well 8' away
4.13.21.222a	H. Price		Broad valley	7075	Dr.	60	6	34.	12-12-52	W,G	1	12-19-52	S	Driller: Les Carter
4.13.21.222b	do		Near arroyo	7060	Dr.	20	6	18.8	12-12-52	W			D	
4.13.22.330	do		do	7000	Dr.	75	6	34.2	12-12-52	W			S	
4.13.27.314	A.N. Armijo	1930	Valley mouth	6925	Dr.	65	6	56.5	12-4-52	W			D	
4.13.27.323	do		do	6925	Dr.	125	7	55.2	12-4-52	W	2	12-5-52	S	

Explanation at end of table

TABLE 1, RECORDS OF WELLS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO, (Continued)

Location number	Owner	Date completed	Topographic situation	Altitude above sea level (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Water level Below ground surface (feet)	Date of measurement	Meth. of lift	Pumping rate GPM	Date of measurement	Use	Remarks
4.13.29.332	A.N. Armijo	1900	Broad rolling valley	6980	Dr.	75	8			W			D	Driller: S.C. Christianson
4.13.29.333	T. Gutierrez	1951	do	6980	Dr.	96	5			H			D	
4.13.30.140a	E. Kline		Low ridge	7100	Dr.	70	5	35.1	12-4-52	W	3	12-5-52	D	
4.13.30.140b	do		do	7100	Dr.	60	6	24.4	12-4-52	H	6	12-4-52	D	Driller: S.C. Christianson
4.13.30.423	Joe Apodaca	1947	Rolling valley	7025	Dr.	98	6	35.2	12-5-52	G	6	12-5-52	D	Driller: Red Guin
4.13.30.424	Mrs. G. Leyba	1947	do	7000	Dr.	70				H	3-4	11-20-52	D	Driller: Red Guin
4.13.30.442	Catron County	1936	do	7000	Dr.	130(?)		24.8	11-20-52	W			D	Schoolhouse well Driller: S.C. Christianson
4.13.30.444	Abelicio Sanchez	1943	do	6980	Dr.	90(?)		29	11-20-52	W	2½	12-5-52	D	Driller: Red Guin
4.13.33.242	A.N. Armijo		Flat between hills	6900	Dr.	175	7(?)	87.9	12-4-52	W			S	Deepened by R.A. Boone Nov. 51
4.13.35.200	T. Gutierrez	1935	S.A. Plains	6870	Dr.	130		105	12-11-52	W	2	12-11-52	S	
4.14.11.330	Manuel Aragon	1936	Gentle slope below scarp	7250	Dr.	70	6	34.9	12-9-52	W	4	12-9-52	S,D	Driller: S.C. Christianson
4.14.11.340	O. Baca	1947	do	7250	Dr.	120	6	42.4	12-9-52	W	6	12-9-52	S	Driller: Jess Heinsohn
4.14.14.300	Manuel Aragon	1920	Low ridge	7200	Dr.	100	5	32.3	11-19-52	N			N	Abandoned
4.14.23.230	Henry Baca	1951(?)	Gentle slope	7200	Dr.		6	57.6	11-19-52	W	2	12-9-52	S	
4.15.26.334	Magdalena stockmen	1938	Broad ridge	7175	Dr.	325				W	2	11-19-52	S	

explanation at end of table

TABLE 1, RECORDS OF WELLS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO, (Continued)

Location number	Owner	Date completed	Topographic situation	Altitude above sea level (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Water level		Meth. of lift	Pumping rate		Use	Remarks
								Below ground surface (feet)	Date of measurement		GPM	Date of measurement		
4.15.32.120	Mel. Aragon	1949	Tularosa Can.	7125	Dr.	355	6	290	Reported	W			S	W of Continental divide Driller: Jess Heinsohn
5.11.19.111	Farr Cattle Co.	1910	S.A. Plains	6845	Dr.	108	5 5/8	80	Reported	W	4	12-19-52	S	Reported High capacity
5.12.1.434	do	1917	do	6877	Dr.	150	5 5/8	110	Reported	W	4 1/2	12-19-52	S	
5.12.4.310	HB Birmingham Jr	1910	do	6855	Dr.	225	6	83.5	12-4-52	W			S	
5.12.5.142	Farr Cattle Co.	1910	do	6843	Dr.	100	5 5/8	80(?)	Reported	W			S	Driller: SC Christianson
5.12.5.440	HB Birmingham Jr	1910	do	6850	Dr.	117	6	83.5	12-19-52	W	4	12-19-52	D,S	Driller: SC Christianson
5.12.9.430	G. Farr	1921	do	6855	Dr.	150	5 5/8	115(?)	Reported	W	6	12-19-52	S	Driller: Ben Kemp Jr.
5.12.34.430a	Farr Cattle Co.	1880	do	6812	Dr.		5 5/8	70(?)	Reported	W	4	12-19-52	D,S	
5.12.34.430b	do	1888	do	6812	Du.	100	5 5/8	70(?)	Reported	W			S	
5.13.3.110	R. McWhorter		Base of hill	6875	Dr.	80	5			W	30-40	Reported	S	4" pump
5.13.5.130	do		Hillside	6950	Dr.	180	5-5 1/2	121.8	12-18-52	W	1	12-19-52	D	
5.13.5.210	do		Valley bottom	6875	Dr.	155	8	56.7	12-18-52	T			I	Driller: L.B. Moore
5.13.9.420	do		S.A. Plains	6795	Dr.			38.3	10-30-52	W	2	8-19-52	S	
5.13.14.210	do	1952	do	6810	Dr.	200	16	50	10-30-52	T	600	Reported	I	Driller: N.H. Wade
5.13.14.320	do		do	6808	Dr.			50	8-19-52	W			S	

Explanation at end of table

TABLE 1, RECORDS OF WELLS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO, (Continued)

Location number	Owner	Date completed	Topographic situation	Altitude above sea level	Type of well	Depth of well	Diameter of well (inches)	Water level		Meth. of lift	Pumping rate		Use	Remarks
								Below ground surface	Date of measurement		GPM	Date of measurement		
5.13.22.100	R. McWhorter	1952	S.A. Plains	6795	Dr.	75	6	44.2	10-30-52	N			N	Packed w/flat gravel
5.13.25.111	Farr Cattle Co.	1927	do	6805	Dr.	160	5 5/8	50	Reported	W	4	10-30-52	S	
5.13.27.420a	A. Sanchez	1940	do	6795	Dr.	75	5	48.9	7-19-52	W			S	Driller: S.C. Christianson Abandoned 12-15-52
5.13.27.420b	do	1952	do	6795	Dr.	75	5	47.2	12-19-52	W			S	50' W of 5.13.27.420a
5.13.28.444		1952	do	6790	Cored	645				N			N	Driller: H. Stanley
5.13.32.330	Frank Hubbell Co.	1941	do	6779	Dr.	1100	5 1/2	60.6	10-30-52	W			S	Abandoned, reported salty water
5.14.5.130	Jaramillo Bros.	1922	Broad valley	6920	Dr.	80	8	49.6	12-12-52	W	1	12-19-52	D,S	
5.14.5.210	Frank Jaramillo	1925	do	6910	Dr.	100	6	46.1	12-12-52	W			S,D	
5.14.9.243b	Frank Hubbell Co		do	6866	Du.	(11)	5	5.7	11-8-52	H	10-15	11-8-52	D	350' W of Paterson Spring
5.14.13.100	do	1947	Base of hill edge of plain	6850	Dr.	(200)	8	7.1	10-31-52	W	6	11-13-52	S	Driller: Julian Clements
5.14.28.310	David Aragon	1952	Base of mtn.	6875	Dr.	344	5	150		W	3	12-9-52	S	Driller: RA Boone
5.14.32.434	Anselmo T. Rael	1922	Edge of plains	6800	Dr.	150		65.4	11-13-52	G			S,D	Driller: Ben Kemp
5.14.33.110	Martin Rael	1939	do	6800	Dr.	290		83	12-3-52	W	4	12-3-52	S,D	Driller: Jesse Peak redrilled 1949

Explanation at end of table

TABLE 1, RECORDS OF WELLS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO, (Continued)

Location number	Owner	Date completed	Topographic situation	Altitude above sea level (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Water level		Meth. of lift	Pumping rate		Use	Remarks
								Below ground surface (feet)	Date of measurement		GPM	Date of measurement		
5.15.9.300	Frank Hubbell Co.	1947	Mtn. valley	7400	Dr.	425	6	400	Reported	G			S	Driller: Julian Clements
6.10.31.100*	Farr Cattle Co	1950			Dr.	1150	6	1100	Reported	W			S	Driller: Ed. Cowley
6.11.9.200*	do	1930			Dr.	401	5 5/8	340	Reported	W	6	Reported	S	Driller: Bill Myers, Sr.
6.11.26.111*	do	1904			Dr.	326		260	Reported	W	10	Reported	S	Driller: Ben Kemp Sr.
6.11.30.410	do	1922	Valley	7150	Dr.	480	5 5/8	285	Reported	W	10	Reported	S	Driller: McKane
6.12.9.130	do		Edge of plains	6815	Dr.	200	5 5/8	75	Reported	W	7	12-19-52	S	Driller: G. Thurgood Deepened 1933, Driller: Sim Gibbons
6.12.12.200	do	1912	S.A. Plains	6837	Dr.	150	5 5/8	70	Reported	W			S	Driller: Kenuke
6.12.28.242	do	1939	Shaw Canyon	7075	Dr.	604	5 5/8	575	Reported	W	4	11-6-52	S	Driller: TE Doty
6.13.11.400a	do	1897	S.A. Plains	6801	Dr.	110	6	53	Reported	W	3	12-14-52	S	Driller: J. Fullerton
6.13.11.400b	do		do	6801	Dr.	100	5 5/8	70(?)	Reported	W			S	Very old
6.13.20.122a	Frank Hubbell co	1918	Edge of plains	6783	Dr.	100	6	47.	10-30-52	W	5	10-30-52	S	Driller: Charlie Powers Pumping level
6.13.20.122b	do	1900	do	6783	Dr.	90	6	33.5	10-30-52	W	5	10-30-52	S	
6.14.7.330	H.B. Birmingham	1922	do	6850	Dr.	125	6	85	10-31-52	W			D	Driller: C. Powers Tested at 35 gpm.
6.14.8.333	do	1948	S. A. Plains	6790	Dr.	60	7	45.5	10-31-52	W	6	11-13-52	S	Driller: Earl Ary

*well outside of Pelona quadrangle
Explanation at end of table

TABLE 1, RECORDS OF WELLS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO, (Continued)

Location number	Owner	Date completed	Topographic situation	Altitude above sea level (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Water level Below ground surface (feet)	Date of measurement	Meth. of lift	Pumping rate GPM	Date of measurement	Use	Remarks
6.14.19.122	Frank Hubbell Co	1930	S.A. Plains	6815	Dr.	100	6	67.2	11-17-52	W	3	11-17-52	S	
6.14.19.211	do	1918	do	6810	Dr.	100	6	64	11-17-52	W			S	Driller: Ben Kemp
6.14.21.433	H.B. Birmingham	1940	do	6734	Dr.	71	6	57	10-31-52	W			S	Driller: S. C. Christianson
6.14.28.330a	Frank Hubbell Co	1918	do	6820	Dr.	90		65.6	11-17-52	G	4	1-27-52	D,S	Driller: C. Powers
6.14.28.330b	do	1902	do	6820	Dr.	90		66	11-17-52	W				Disconnected
6.14.31.122	do	1900	do	6800	Dr.		5	(63.5)	1-27-53	W	2	11-17-52	S	Water level measured while barely pumping
6.15.1.430	DC Rael Estate	1933	Hillside	7125	Dr.	90	6	26.2	11-13-52	W	3	11-13-52	D,S	Spring Nearby Driller: C. Powers
6.15.17.400	Forest Service	1890	Long Canyon	7275	Du.	80	48	46.1	11-14-52	W	2	11-14-52	S	Camp
6.15.24.111	H.B. Birmingham	1946	Mouth of Long Canyon	6923	Dr.	191	5 3/4	182	Reported	W	4	11-13-52	S	Driller: Red Guin
7.12.3.400	Farr Cattle Co	1950	Shaw Canyon	7280	Dr.	770	6			W			S	Driller: Ed. Cowley
7.14.3.000	Frank Hubbell Co	1908	S.A. Plains	6855	Dr.	200		198	Reported	G			S	
7.14.17.240	do	1914	Mouth of Y Canyon	6922	Dr.	400		90	Reported	E	2-3	1-27-53	D	Driller: Jim Davis Originally well tested at 25 gpm. from 370'
8.13.16.000	do	1938	Canyon	7525	Dr.	1385	6	900	Reported	W			S	Driller: Joe Turner

Explanation at end of table

TABLE 1, RECORDS OF WELLS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO, (Continued)

Location number	Owner	Date completed	Topographic situation	Altitude above sea level (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Water level		Meth. of lift	Pumping rate		Use	Remarks
								Below ground surface (feet)	Date of measurement		GPM	Date of measurement		
8.16.1.330	Forest Service	1941	Collins Park	7480	Dr.	600	5	570	Reported	G			D,S	
9.14.9.000	Frank Hubbell Co	1949	O Bar O Canyon	7296	Dr.	1025	6			E			S	Driller: Van Turner Co.

Explanation:

Type of Well: Dr, drilled; Du, dug

Method of Lift: W, Windmill; G, gasoline engine and pump jack; H, hand pump; N, no pump; T, deep well turbine pump; E, engine

Use: S, stock; D, domestic; I, irrigation; N, none

TABLE 2. RECORDS OF SPRINGS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO

Location number	Owner	Name	Topographic situation	Altitude above sea level (feet)	Kind of rock	Character of openings	Improvements; Accomodations	Yield		Use	Remarks
								GPM	Date of measurement		
3.14.19.100*	U. S. Forest Service	Caballeriza(?)	Hillside near Continental Div.			Covered	Concrete cistern	Very little	11-7-52	W	Watering place for wild-life
4.13.10.110	Hiram Price	Jones Spring	Slope above draw in hills	7325		Covered	Piped to log trough	2	12-18-52	S	Numerous canyons in vicinity contain undeveloped springs and intermittent flow
4.13.19.420	Hiram Price		Shallow valley	7150	Pyro-clastic	Covered	Wooden cistern	1-2	estimated 12-18-52	S	
4.13.30.340	Frank Aragon	Horse Springs	Open valley	7071	Tuff	Covered	Concrete cistern, ditch, & pipe to 2 houses	10	11-20-52	D,I	
5.13.8.310	Ralph McWhorter		Base of hill at edge of plains	6825	Alluvium	Covered	piped to tanks	2	10-31-52	S	10 gpm. reported
5.14.9.234a	Frank Hubbell Company	Paterson Spring	Broad valley	6866	Alluvium	Holes below edges of pond in meadow	Tub; ditch to lake	200-225	12-18-52	I,S	
5.14.18.000	do	Diego Springs	Edge of plains	6825	Alluvium			weak	Reported	S	Intermittent

* outside Pelona quadrangle
Explanation at end of table

TABLE 2, RECORDS OF SPRINGS IN PELONA QUADRANGLE, CATRON COUNTY, NEW MEXICO, (continued)

Location number	Owner	Name	Topographic situation	Altitude above sea level (feet)	Kind of rock	Character of openings	Improvements; Accommodations	Yield		Use	Remarks
								GPM	Date of measurement		
5.15.22.330	do	Dark Canyon	Dark Canyon	7600	Basalt	Crevice?	Long ditch to tank	10	Estimated 11-18-52	S	50 gpm. reported in past
5.15.36.300	D.C. Rael Estate	Rael Canyon	Rael Canyon	7375	Basalt	Crevice?	Pipe to steel tank Covered small dam & settling pit	very little	11-18-52	S	
5.16.3.300	Aragon Family	Tularosa River Springs	Tularosa Canyon	6800		Seeps & crevices	None at springs; Ditch downstream	1500	1-27-53	I	River, all from this group of springs, supplies irrigation water for valley.
6.16.16.400	U. S. Forest Service	Willow Spring	Squirrel Springs Canyon	7750	Basalt	Covered	Piped to log troughs	0.1	11-14-52	SW	
8.16.27.122	Frank Hubbell Company	Turkey Spring	Draw near Continental Divide	8060		Covered	Piped to large steel tank	0.1	12-3-52	S	Reported 1-2 gpm. went dry, summer 1952

Explanation

Use: W, Watering place; S, Stock; D, Domestic; I, Irrigation

TABLE 3, RECORD OF WATER ANALYSES

Well number	Analysis number	Date of collection	Silica (SiO ₂) ppm	Sodium (Na) +Potassium (K) ppm	Carbonate (CO ₃) ppm	Bicarbonate (HCO ₃) ppm	Sulfate (SO ₄) ppm	Chloride (Cl) ppm	Fluoride (F) ppm	Nitrate (NO ₃) ppm	Hardness as CaCO ₃		Specific conductance (Micromhos at 25° C)	Percent sodium
											Total ppm	Non-carbonate ppm		
3.11.31.300	21058	12/11/52	46	73	Trace	254	43	63		2.9	185	0	662	46
3.11.35.311	21341	1/26/53	27	40	0	217	7.8	12	.6	.3	118	0	369	42
3.12.33.434	21342	1/28/53	53	23	0	131	8.2	7.0	.2	1.0	78	0	232	39
3.14.19.100S*	20584	10/7/52	42	13	0	100	15	2	.2	.2	73	0	185	28
4.11.6.140	21059	12/11/52	30	117	8	282	66	86		3.3	183	0	844	58
4.11.17.333	21060	12/17/52	18	25	0	160	7.4	11		2.7	102	0	292	35
4.12.12.410	21061	12/17/52	17	93	0	301	68	72	.4	.2	217	0	803	49
4.12.12.420	21142	12/17/52	20	112	0	342	90	88	.2	1.4	255	0	941	49
4.12.15.420	21062	12/17/52	22	55	6	276	51	86	.1	.5	293	57	778	29
4.12.24.122	21063	12/11/52	22	32	0	169	8.8	17		3.7	106	0	324	39
4.12.30.420	21064	12/11/52	65	40	16	178	22	31	.4	3.9	156	0	442	36
4.12.31.310	21065	12/11/52	59	33	0	194	36	40		5.6	186	27	488	28
4.13.10.110S	21066	12/18/52	36	65	37	85	5.8	7		1.8	7	0	279	95
4.13.19.420S	21067	12/18/52	42	73	60	62	5.6	3		1.6	4	0	311	98
4.13.21.222a	21068	12/19/52	44	45	18	248	22	14	.6	2.7	182	0	502	35
4.13.27.323	21069	12/5/52	41	51	0	307	29	28	.8	3.3	214	0	603	34
4.13.30.140a	21070	12/5/52	38	24	0	153	8.2	6	.6	2.6	93	0	272	36

Analyses by United States Geological Survey Quality of Water Laboratory, Albuquerque.
ppm - parts per million

* S - sample from spring

TABLE 3, RECORD OF WATER ANALYSES, (Continued)

well number	Analysis number	Date of collection	Silica (SiO ₂) ppm	Sodium (Na)		Carbonate (CO ₃) ppm	Bicarbonate (HCO ₃) ppm	Sulfate (SO ₄) ppm	Chloride (Cl) ppm	Fluoride (F) ppm	Nitrate (NO ₃) ppm	Hardness as CaCO ₃		Specific conductance (Micromhos at 25° C)	Percent sodium
				Potassium (K) ppm								Total ppm	Non-carbonate ppm		
4.13.30.140b	21071	12/4/52	29	25	0	161	9.9	7	.6	1.8	102	0	290	34	
4.13.30.340s	21072	11/20/52	41	31	0	138	7.4	5	.6	1.5	63	0	235	52	
4.13.30.423	21073	12/5/52	44	29	0	194	13	12	.8	4.6	133	0	365	32	
4.13.30.424	21074	11/20/52	45	30	0	200	14	10	.6	19	144	0	397	31	
4.13.30.444	21075	12/5/52	46	58	0	292	26	42	.6	11	211	0	638	37	
4.13.35.200	21076	12/11/52	45	47	0	205	14	16	.6	1.2	105	0	378	49	
4.14.11.330	21077	12/9/52	25	24	0	111	6.6	5	.2	3.1	56	0	205	48	
4.14.11.340	21089	12/9/52			6	95		3					198		
4.14.23.230	21090	12/9/52	12	14	0	108	2.9	4	.2	.2	66	0	186	32	
4.15.26.334	21091	11/19/52	25	37	0	166	6.6	10	.6	1.5	79	0	304	50	
4.15.32.120	22501	3/19/53	51	28	0	173	11	5	1.6	2.6	105	0	299	37	
4.16.17.244	22502	3/19/53	34	12	0	167	7.4	10	.2	10	142	5	315	15	
4.16.28.200	22503	3/19/53	36	8	0	88	21	12	.2		94	22	234	16	
5.11.19.111	21092	12/19/52	24	42	0	208	14	41	.2	6.2	158	0	489	36	
5.12.1.434	21093	12/14/52	22	31	0	146	11	46	.2	33	156	36	465	30	
5.12.5.440	21094	12/19/52	19	26	14	142	7.4	14	.3	1.1	112	0	321	34	
5.12.9.430	21095	12/19/52	20	35	5	140	8.2	32	.3	6.6	107	0	360	42	

Analyses by United States Geological Survey Quality of Water Laboratory, Albuquerque.
 ppm - parts per million
 * S - sample from spring

TABLE 3, RECORD OF WATER ANALYSES (Continued)

Well number	Analysis number	Date of collection	Silica (SiO ₂) ppm	Sodium (Na)			Sulfate (SO ₄) ppm	Chloride (Cl) ppm	Fluoride (F) ppm	Nitrate (NO ₃) ppm	Hardness as CaCO ₃		Specific conductance (Micromhos at 25° C)	Percent sodium
				Potassium (K) ppm	Carbonate (CO ₃) ppm	Bicarbonate (HCO ₃) ppm					Total ppm	Non-carbonate ppm		
5.12.34.430	21096	12/19/52	25	80	10	192	15	17	1.0	6.3	46	0	422	79
5.13.5.130	21097	12/19/52	31	86	5	209	23	23	1.4	4.8	56	0	468	77
5.13.8.310S	20585	10/31/52	48	87	71	64	12	4	1.4	1.5	5	0	364	97
5.13.9.420	21115	12/19/52	40	144	16	294	14	27	1.8	.2	11	0	610	97
5.13.25.111	20586	10/30/52	25	95	18	175	7	22	2.8	0.0	14	0	400	94
5.14.5.130	21116	12/10/52	38	24	18	160	19	16	.6	18.	168	8	406	24
5.14.9.243aS	20587	11/8/52			0	133		4					233	
5.14.9.243b	20588	11/8/52	42	20	0	160	9.5	5	.6	3	109	0	281	28
5.14.13.100	21117	11/13/52	42	39	0	154	8.2	8	1.	1.5	64	0	275	57
5.14.28.310	21118	12/9/52	15	348	18	459	26.	240	1.6	.9	19	0	1520	98
5.14.33.110	21139	12/3/52	19	1080	17	242	92	1660	1.2	.4	320	94	5630	88
5.15.2.300	21140	12/9/52	43	33	0	251	12	12	.3		165	0	442	30
5.15.9.300	22858	5/15/53									267		571	
5.15.22.330S	21141	11/18/52	39	12	0	181	1.6	4	.4	.2	131	0	294	16
5.15.36.300S	21144	11/18/52	44	21	0	184	9.9	5	.6	.4	125	0	308	27
5.16.3.300S	21145	11/20/52	44	20	0	138	7	5	.4	.5	86	0	236	33

Analyses by United States Geological Survey Quality of Water Laboratory, Albuquerque.

ppm - parts per million

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* S - sample from spring

TABLE 3, RECORD OF WATER ANALYSES, (Continued)

Well number	Analysis number	Date of collection	Silica (SiO ₂) ppm	Sodium (Na)		Carbonate (CO ₃) ppm	Bicarbonate (HCO ₃) ppm	Sulfate (SO ₄) ppm	Chloride (Cl) ppm	Fluoride (F) ppm	Nitrate (NO ₃) ppm	Hardness as CaCO ₃		Specific conductance (Micromhos at 25° C)	Percent sodium
				Potassium (K) ppm								Total ppm	Non-carbonate ppm		
6.12.9.130	21146	12/19/52	42	90	6	233	59	22	2	1	105	0	572	65	
6.12.28.242	20589	11/6/52	26	53	17	44	24	12	6	3.9	11	0	233	91	
6.13.11.4000	21147	12/19/52	48	104	5	187	51	33	3.6	.9	44	0	533	84	
6.13.20.122a	20590	10/30/52	45	167	0	176	39	141	2.4	1.5	29	0	804	93	
6.13.20.122b	20591	10/30/52			0	159		136					772		
6.14.7.330	21152	11/13/52	37	22	0	170	13	8	.2	4.2	120	0	314	29	
6.14.8.333	21153	11/13/52	51	12	0	128	7.8	2	.2	.7	92	0	211	21	
6.14.19.122	21154	11/17/52	42	27	0	179	31	6	.2	4.2	133	0	352	31	
6.14.28.330a	21343	1/27/53	32	18	0	92	14	27	1	2.7	94	18	270	29	
6.14.31.122	21155	11/17/52	43	32	0	168	14	5	1	.9	92	0	288	43	
6.15.1.430	21148	11/13/52	42	19	0	163	5.8	8	1	1	113	0	297	27	
6.15.17.400	21156	11/14/52	41	9.9	0	70	30	4	2	2.2	75	18	185	22	
6.15.24.111	21157	11/13/52	30	162	10	312	26	38	1.4	.8	5	0	667	99	
6.16.6.400S	21158	11/14/52	40	18	0	231	8.6	5	.2	.5	168	0	369	19	
7.14.7.240	21344	1/27/53	40	9	0	58	15	5	.2	3.7	54	6	150	27	
8.16.27.122S	21159	12/3/52	62	12	0	93	13	3	.2	1	70	0	173	26	

Analyses by United States Geological Survey Quality of Water Laboratory, Albuquerque.

ppm - parts per million

* S - sample from spring

TABLE 4, WELL LOGS, (Continued)

Well 5.13.14.210
 Owner: R. McWhorter, Horse Springs, New Mexico
 Driller: N. H. Wade, Quemado, New Mexico
 Completed: February 1952

<u>Formation</u>	<u>Thickness</u>	<u>Depth</u>
First water at		50
sand and water to (about 20-30 gpm.)		70
brown muck	20	90
sand and clay at		90
heavy water sand	25	115
clay	2	117
water sand	5	122
clay	2	124
water sand	6	130
clay	35	165
sand and clay, intermittent	35	200

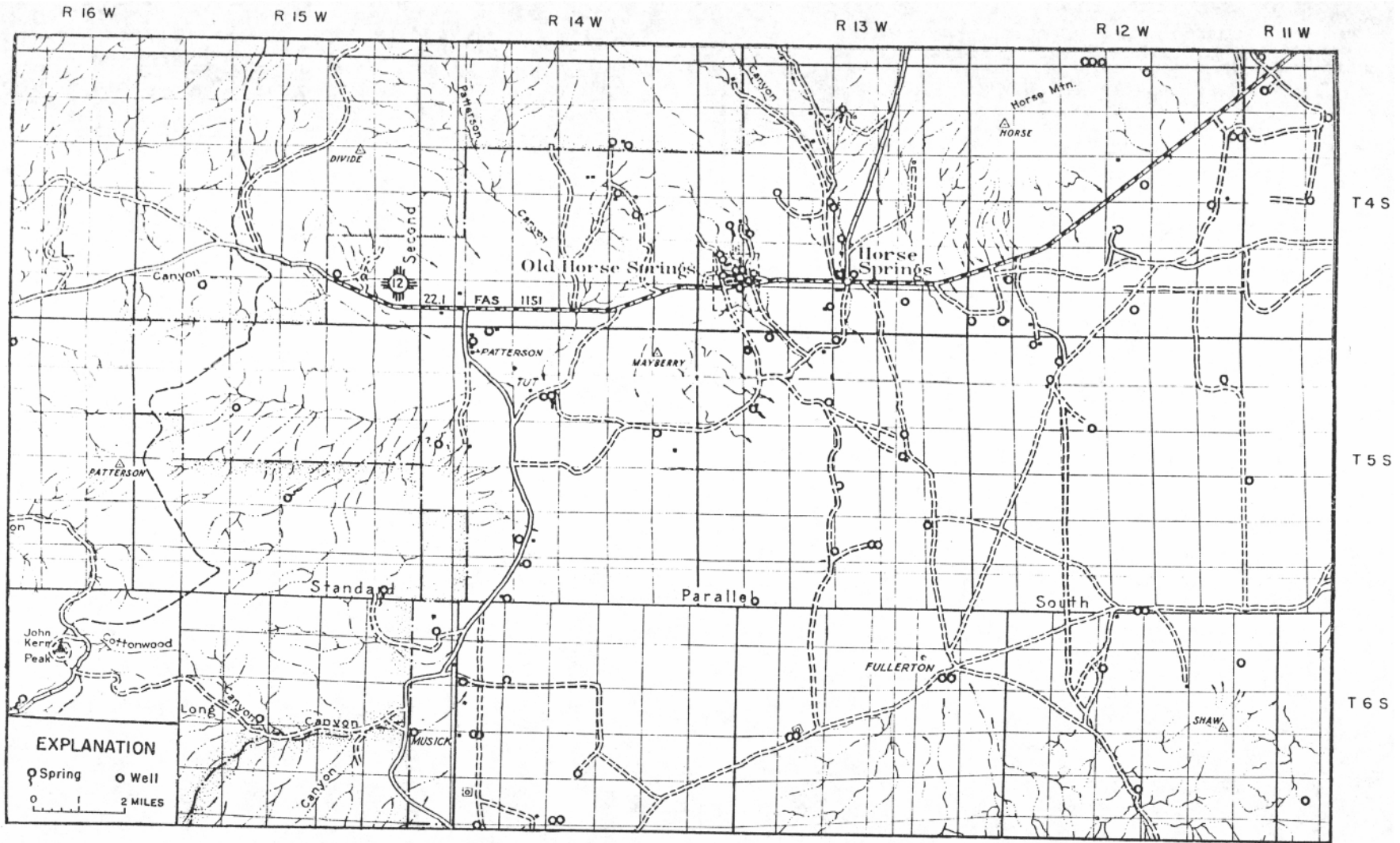
Well 5.14.28.310
 Owner: David Aragon
 Driller: D. A. Boone, Quemado, New Mexico
 Completed: March 31, 1952

<u>Formation</u>	<u>Thickness</u>	<u>Depth</u>
top soil	15	15
coarse glassy rocks, pink, gray, and red	45	60
soapstone	25	85
coarse glassy rocks, changing in color	111	196
clay	8	204
coarse rock, $\frac{1}{2}$ gpm. at 215'	14	218
brown rock	12	230
coarse rock, very blue	65	295
brown rock	8	303
red clay	7	310
coarse gray rock	14	324
white sand rock	21	344
total depth		344
water at 330', rose 188'		
in well to 156' below ground surface		

TABLE 4, WELL LOGS

Well 5.13.28.244
 Owner: Oberlin College, Climatic Research Project
 Driller: H. Stanley, Ft. Worth, Texas
 Completed: December 1952
 Cored to bottom

<u>Formation</u>	<u>Thickness</u>	<u>Depth</u>
clay, silty	2.5	2.5
silt, clayey	21.5	24.0
silt, gray, hard	15.0	39.0
clay, silty, blue gray	3.6	42.6
sand, clay	3.4	46.0
sand, fine, carbonaceous matter	4.5	50.5
sand, medium, silty, black, dense	2.8	53.3
no sample	4.7	58.0
sand, clay, and silt, in intermittent layers	21.3	79.3
sand, medium to fine, trace silt	20.7	100.0
sand, clay, and silt, in layers	35.0	135.0
no sample	2.0	137.0
sand, silty; and silt, sandy; int. layers	10.0	147.0
silt, clayey, greenish	1.0	148.0
sand, very coarse, greenish clay, some silt	4.0	152.0
gravel, fine, sandy, gray, of malpais	2.0	154.0
silt, clayey	3.0	157.0
sand	.6	157.6
silt, grayish black, thin sand layers	11.6	169.2
clay, silty, dark gray, sand lenses up to 0.5 ft. thick	23.0	192.2
no sample, (drills like coarse sand)	3.0	195.2
sand, silty, olive gray, and silt, clayey	1.8	197.0
no sample	2.0	199.0
silt, clayey; sand	1.5	200.5
no sample	3.5	204.0
sand, fine, silty; silt, clayey and sandy; gray-black, intermittent layers	59.9	263.9
log unavailable (reported silt and clay)	189.6	453.5
silt, clayey	4.5	459.0
no sample	10.0	469.0
silt, gray-black, sandy lenses, some calcite particles	78.5	547.5
silt, olive green	28.7	576.2
silt, grayish black	21.8	598.0
silt, olive green	12.5	610.5
silt, olive green, sandy	4.5	615.0
silt, olive green, pebbles at 624	21.0	636.0
no sample	9.0	645.0
Total depth		



SOUTHWESTERN PART OF SAN AGUSTIN PLAINS