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Rural Water Supplies in South Dakota : Perkins County

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PERKINS
County

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RURAL WATER SUPPLIES

IN

SOUTH DAKOTA

PERKINS COUNTY

BY

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AND

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PREPARED BY THE WORK PROJECTS ADMINISTRATION AS A REPORT ON THE WELL SURVEY CONDUCTED AS WORK PROJECTS ADMINISTRATION OFFICIAL PROJECT 665-74-3-126; SPONSORED BY THE EXTENSION SERVICE AND THE EXPERIMENT STATION SOUTH DAKOTA STATE COLLEGE, IN COOPERATION WITH THE STATE GEOLOGICAL SURVEY.

JANUARY 1940

FOREWORD

This study was first proposed as a project of the Mineral Resources Committee of the State Planning Board under the direction of the State Geological survey and undertaken as a Work Projects Administration project sponsored by the State Planning Board, and was continued under the Planning Board until that body was abolished July 1, 1939 by the State Legislature. At that time sponsorship was transferred to the South Dakota Agricultural Experiment Station and the State College Extension Service, South Dakota State College. Field work was begun October 1, 1938 and was practically completed by February 15, 1939. Workers were assigned in the several counties under the supervision and direction of the County Agricultural Agents and Field Supervisors who were employed by the Work Projects Administration. Questionnaires were mailed out from the offices of the County Agents and were checked and tabulated in these offices. The material was then forwarded to the central office for final tabulation and analysis under the direction of Elmer E. Meleen and Walter V. Scright.

Particular credit should be given to the individual County Agricultural Agents in the various counties of the state who arranged the contacts with the individuals from whom these data were collected, furnished a large portion of the necessary supplies for field work, and directed the workers engaged in collecting field data. Without this assistance in gathering basic data, this study could not have been conducted. The value of the report is therefore in direct proportion to the accuracy and adequacy of these basic data.

INTRODUCTION

PURPOSE

This report on rural water supplies of South Dakota has been prepared to present data recently made available on the types and the sources of water supply, exclusive of stream, lake and dam waters. The information presented is of importance to evaluate present supplies. It should also prove useful as a basis for further development of supplies where they are needed or become necessary. Further, it is hoped that the facts presented may prove of value in any program of water conservation.

SOURCES OF INFORMATION

Questionnaires were sent to all, or essentially all of the farmers of the state, asking for complete data on farm wells and supplementary supplies, with the exception of the supplies above noted. A most gratifying number returned questionnaires, actually 60.1% average for the entire state. The coverage is probably more than 60.1% since it is likely that many unanswered inquiries were those to farmers who were without wells, the type of supply emphasized in the questionnaires. The data thus obtained were supplemented with information contained in the files of the State Geological Survey, the office of the State Engineer, and reports of the United States Geological Survey. This supplementary information, together with that contained in questionnaires was used in making the well location maps included in this report.

PROCEDURE

All data from the questionnaires were tabulated and analyzed statistically by counties, which were made the areal units of study. Within the county,

Acknowledgments - The authors wish especially to acknowledge and commend the consceintious assistance of Mr. E. L. Woodburn, Supervisor, for careful and painstaking supervision of statistical work. The authors also desure to express appreciation for the constant interest and support of this project by Mr. Bob Butts, Director of Research and Records Projects, South Dakota Work Projects Administration.

supplies were allocated as to kind on county maps. Since shallow waters are the most important source of rural supply in South Dakota, wells 200 feet deep and less were plotted on county maps from which maps indicating depths of wells by 50 foot intervals were made. Springs, shown on the well location map, and cisterns were also tabulated as important supplementary supplies, although the latter do not appear on maps or in the tables in this report.

PRESENTATION OF DATA

For convenience and utility, this report has been divided into sections, each covering one county, and each county section bound separately. Each county report contains the following material wherever possible.

1. Well Location Map: This map shows the location of all wells and springs within the county, so far as information is now available. These have been plotted in such a manner that artesian and shallow wells can be differentiated readily by the reader. Artesian wells, where they occur, are divided into flowing and pumped. Artesian wells showing decreased flow and those reported as controlled are also indicated by symbols. Shallow wells are differentiated as adequate and inadequate, and dry holes as of 1938 are located. Wells from other sources of information other than questionnaires collected by this survey are shown in blue.

2. Shallow Well Map: This map shows, as accurately as possible, in 50 foot intervals, the depths at which shallow supplies are commonly obtained. Where shallow wells are abundant, as indicated by the well location map, the map is as accurate as the information on which it is based, but where such wells are sparsely distributed errors are likely to occur. In many places reports of shallow wells are absent, in which case the area has been left blank.

3. Table of Pumped Wells, from 0 to 200 feet (inclusive) in depth: This table shows minimum, maximum, and average depths of wells within the county, as reported in the questionnaires. Tabulations are by townships. The general character of the water, hard, medium, and soft, as reported by farm-

ers, and the number of wells suitable or unsuitable for drinking are shown in this table. Further, the adequacy of supply, as indicated on the questionnaires, and use for irrigation are shown here.

4. Table of Wells greater in depth than 200 feet: Minimum, maximum, and average depths are indicated. Character, reported as hard, medium or soft is tabulated. Adequacy and use for irrigation are shown as in the preceding table.

5. Table of flowing wells: Minimum, maximum, and average depths are shown together with general character and use for irrigation. The volume of flow as reported, and the number of flowing wells reported as equipped with control valves is also included in this table.

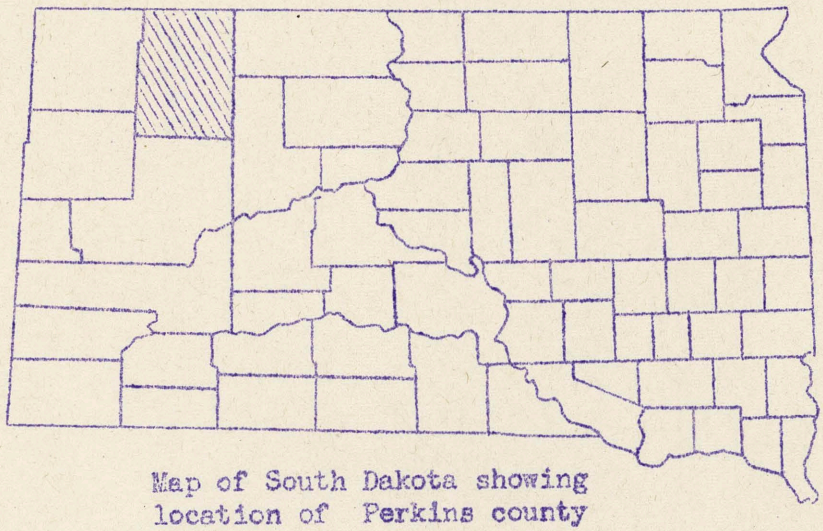
SUMMARY OF STATE SUPPLIES

In the entire state, a total of 48,479 wells were reported in response to questionnaires, returned by 60.1% of the recipients. If those who did not respond have a number of wells in proportion to those who reported, there are approximately 80,000 wells in South Dakota. There are possibly many less than this number since several counties with large numbers of wells returned over 75% of the questionnaires and since many farmers without wells did not reply because they were not requested to do so in the formal questionnaire. Of the wells reported, 16.2% are artesian, including both pumped and flowing wells. Shallow wells are 83.8% of the wells reported. Wells from shallow sources are thus obviously by far the most important means for obtaining water in rural South Dakota.

Important supplementary supplies are cisterns and springs. Roughly, there is more than one cistern to each 40 wells. Many springs are reported, however, in counties with very few wells, so that in some localities they are of considerable importance.

PERKINS COUNTY

Perkins county lies in the northwestern part of South Dakota, approximately 50 miles east of the Montana boundary. It is bounded on the north by the state of North Dakota, on the east by Corson and Ziebach counties, on the south by Meade county, and on the west by Harding and Butte counties.



Map of South Dakota showing location of Perkins county

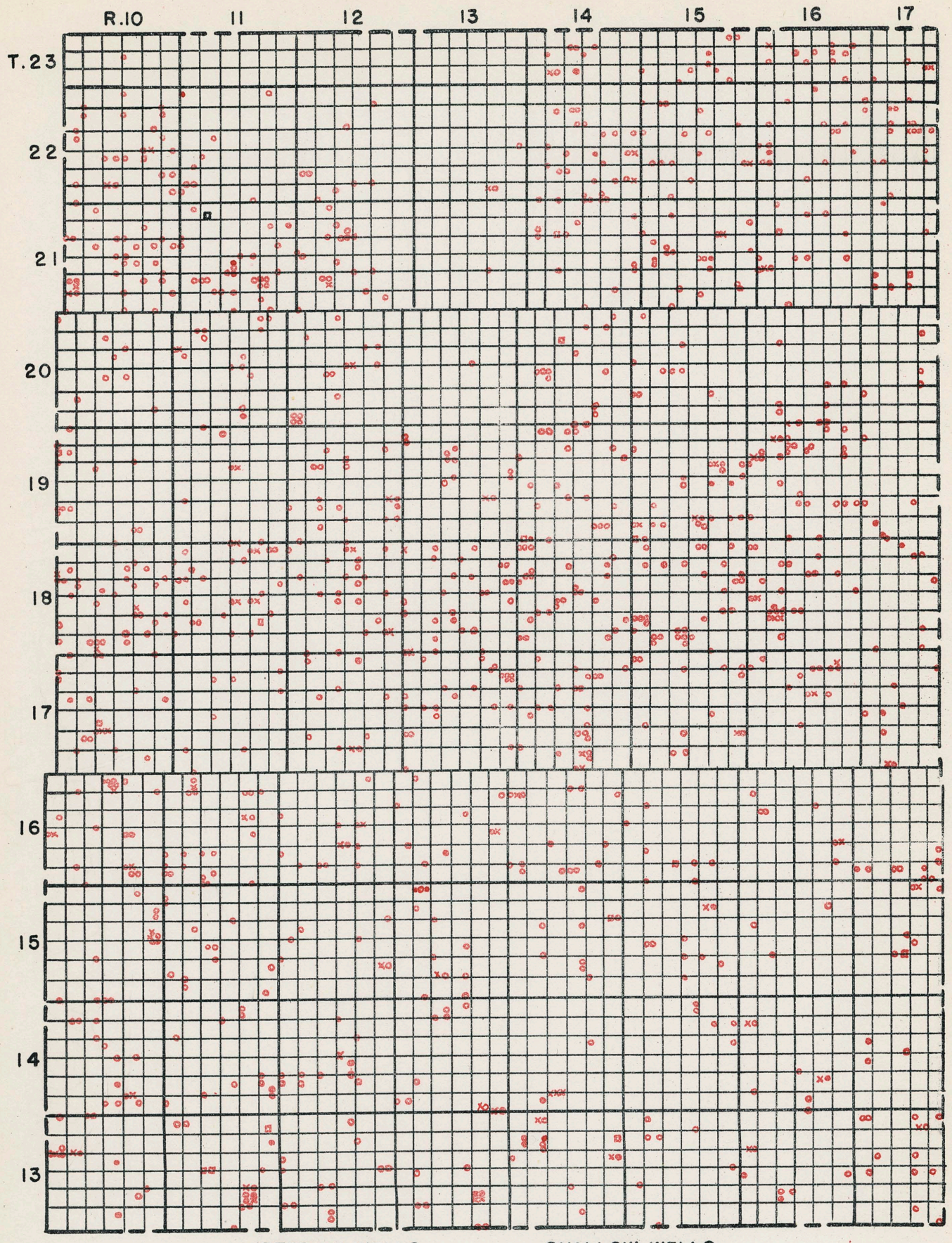
Perkins county is mainly an agricultural county with 64.2 per cent, or 1,196,451 of the 1,864,960 acres in farms, divided into 1461 farm units of approximately 818 acres each. Approximately 27 per cent of the acreage in farms is under cultivation. Wheat, tame and wild hay, corn, oats, barley, sorghum forage, rye, and flax are the important field crops, being produced in the order named. Livestock is also important; cattle, sheep, horses and mules, and hogs are of most value.*

In order that farms of this type may be operated successfully, suitable and adequate supplies of underground water are required at low cost. The supplies required are not great but they should be generally distributed. The well location map and the shallow well map indicate that supplies are available and widely distributed in Perkins county, although some areas appear to lack supplies.

On the well location map, all wells are shown in red and are called shallow wells regardless of depth. On all other maps and in the tables and the

*South Dakota Agricultural Statistics, Annual Report, 1937.

LOCATION OF ARTESIAN AND SHALLOW WELLS IN PERKINS COUNTY



ARTESIAN WELLS
- PUMPED

SHALLOW WELLS
- ADEQUATE SUPPLY
- INADEQUATE SUPPLY
- DRY WELLS
- SPRINGS

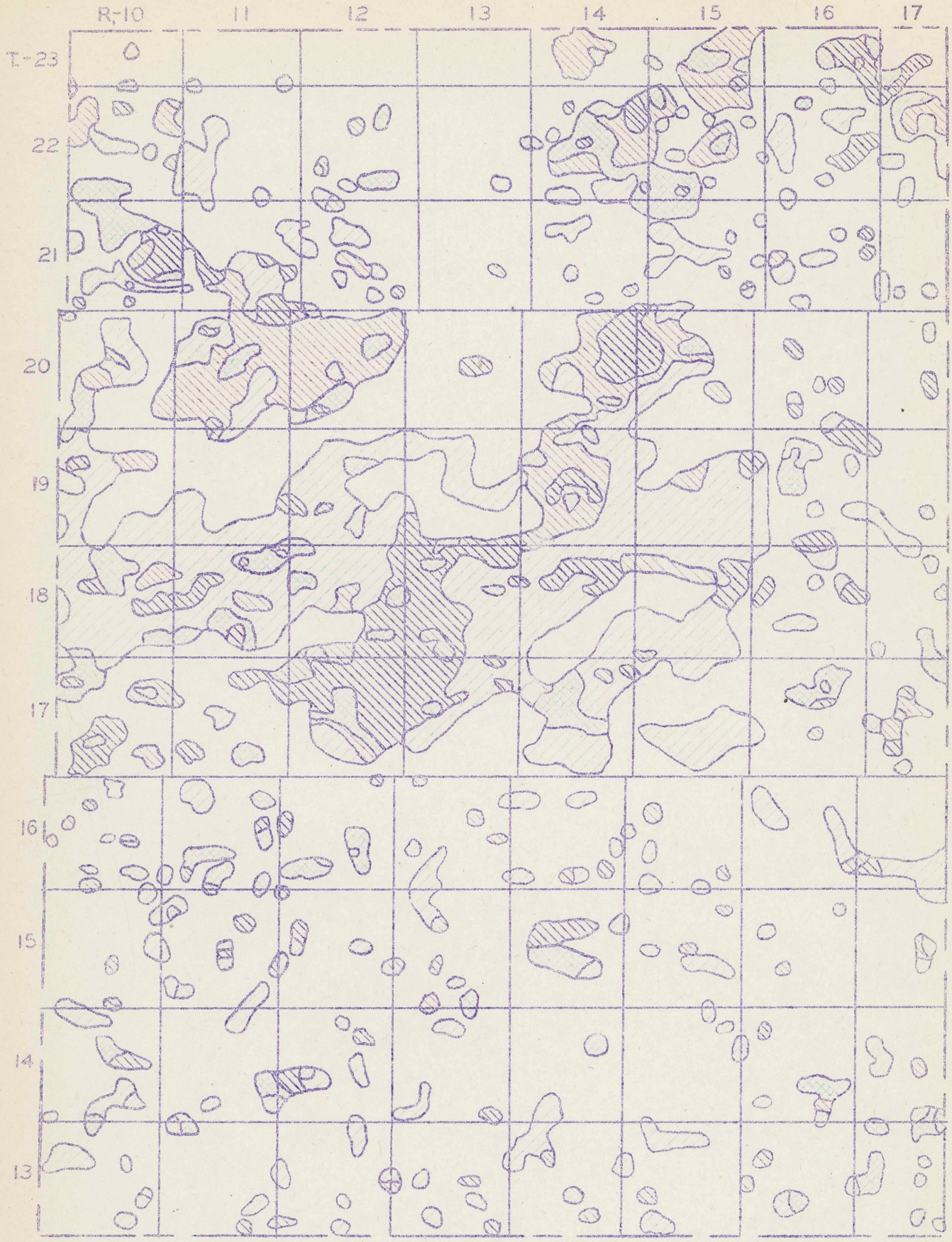
text of this report, the term shallow wells applies to those wells of 200 foot depth or less and those greater than 200 feet are treated as deep wells. Without doubt, many of these wells obtain water under sufficient pressure to raise it in the well above its source. These are correctly to be classed as artesian wells but they cannot be separated from others by the data on which this report is based and are thus all included with shallow and deep wells. Questionnaires were sent to 1068 farmers and land owners of Perkins county, 804 of whom responded with information on 1033 wells and 18 springs throughout the county. This represented a coverage of 75.3 per cent for the county.

DEPTH AND DISTRIBUTION

Much of the rural water supplies in Perkins county are obtained from deep pumped and shallow pumped wells. The shallow well map on page 7 indicates that some water was being obtained at shallow depths from almost all parts of the county in 1938. For the most part, fairly adequate supplies were reported from all parts of the county.

Shallow wells: Wells less than 200 feet deep are the most important source of supplies in the county. Approximately 90 per cent of all wells reported from Perkins county were shallow pumped wells. No wells are reported from Twp.23N., Rge.11E., Twp.23N. Rge.12E., and Twp.23N., Rge.13E. Of the 931 shallow wells reported, 56 per cent ranged from 0 to 50 feet in depth; 13.4 per cent from 50 to 100 feet; 15.2 per cent from 100 to 150 feet; and 15.4 per cent from 150 to 200 feet. Thus, approximately 69 per cent of all shallow wells reported were less than 100 feet in depth. Furthermore, the wells from 0 to 100 feet comprised 62.5 per cent of the total wells reported for the county. The shallow well map shows the common depths at which water from shallow wells is obtained. The percentage of shallow wells decreases with depth, indicating that whenever possible shallow supplies are used because of the increased cost of construction of deeper wells.

PERKINS COUNTY



SHALLOW WELLS (0-200 FT.)

DEPTHS AT WHICH SUPPLIES ARE COMMONLY OBTAINED

0-50 FT. 50-100 FT. 100-150 FT. 150-200 FT.

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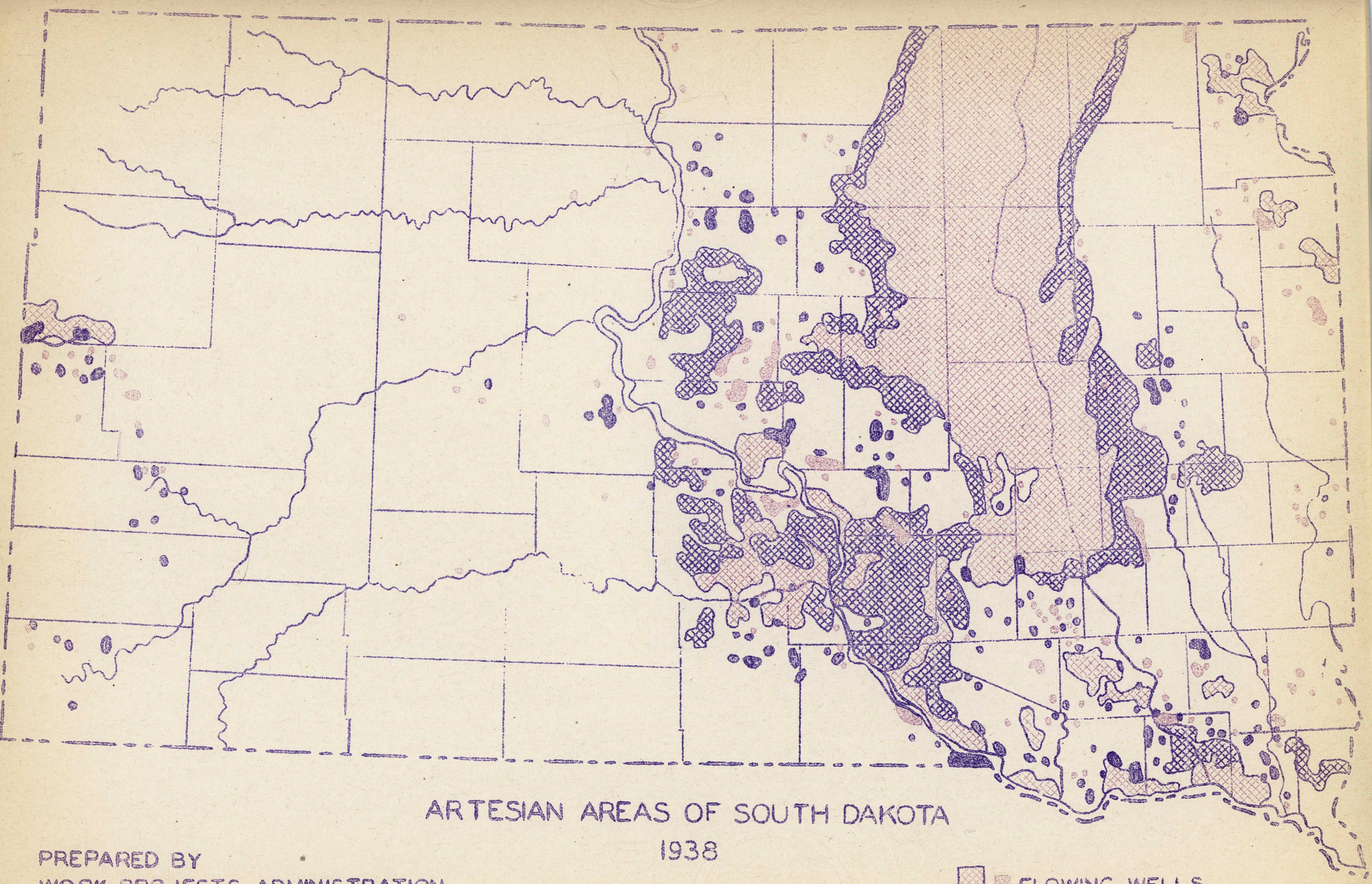
MILES

In general, shallow wells are evenly distributed and are reported at various depths of 200 feet or less, but in Twp.19N., Rge.11E., and Twp.23N., Rge.10E., all shallow wells were reported less than 50 feet in depth; and in four townships; Twp.20N., Rge.13E., Twp.21N., Rge.13E., Twp.20N., Rge.17E.,and Twp.23N., Rge.16E., all shallow wells were reported more than 50 feet deep. (See shallow well map.)

All wells reported from the following townships in the county were reported shallow

Twp.	Rge.	Total Number of wells	Twp.	Rge.	Total number of wells
13N.	10E.	8	19N.	13E.	11
13	13	8	19	17	6
13	14	10	20	10	9
13	15	7	20	11	15
13	16	6	20	12	13
14	10	15	20	13	1
14	12	10	20	15	9
14	13	8	21	12	17
14	14	2	21	13	1
14	16	6	21	14	10
14	17	3	21	17	6
15	10	11	22	10	21
15	16	3	22	11	9
15	17	5	22	12	8
16	11	19	22	13	2
16	12	11	22	14	27
16	16	6	22	15	15
16	17	9	22	16	17
17	17	7	23	10	1
18	17	7	23	14	7
19	10	12	23	15	9
19	12	17	23	17	3

Deep wells: Approximately 10 per cent (9.9) of the rural well water supplies of Perkins County were obtained from deep pumped wells. These wells, totaling 102, were reported from 41 of the 68 townships, but no deep flowing wells were reported. The deep wells ranged in depth between 201 and 1008 feet (see table 3).Township 21N., Rge.11E.,reported one deep well,(1008 feet deep), but all other deep wells were reported to range from 201 to 380 feet in depth. Of the 41 townships reporting deep wells, 32 townships listed wells from 201 to 300 feet. The following tabulation shows the minimum and maximum depths of deep wells by townships:



ARTESIAN AREAS OF SOUTH DAKOTA

1938

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FLOWING WELLS

PUMPED ARTESIAN WELLS

Twp.	Rge.	Number of Deep Wells	Min.	Max.	Twp.	Rge.	Number of Deep Wells	Min.	Max.
13N.	11E.	3	226	280	18N.	10E.	2	208	266
13	12	2	250		18	11	1	300	
13	17	1	240		18	12	2	300	306
14	11	2	215	253	18	13	3	250	380
14	15	1	205		18	14	3	204	290
15	11	1	220		18	15	9	204	375
15	12	1	292		18	16	9	225	358
15	13	2	206	248	19	11	1	249	
15	14	2	233	380	19	14	3	218	260
15	15	2	250	290	19	15	5	215	350
16	10	2	211	230	19	16	7	208	300
16	13	1	213		20	14	1	215	
16	14	4	220	280	20	16	2	236	270
16	15	1	232		20	17	1	240	
17	10	1	220		21	10	5	203	268
17	11	1	225		21	11	1	1008	
17	12	1	350		21	15	2	210	216
17	13	3	201	372	21	16	1	250	
17	14	4	204	300	22	17	1	215	
17	15	2	222	250	23	16	2	220	240
17	16	4	220	237					

CHARACTER OF WELL WATERS

In order to determine the character of well waters in the county, users were asked whether they considered their supplies to be hard, moderately hard, or soft. Although chemical analyses of well waters are not commonly available to farmers, usage of the water is a fairly good criterion of general character. Details must await adequate chemical analyses.

Of the shallow wells reported from the county, 26.5 per cent produced hard water; 39.4 per cent moderately hard; and 34.1 per cent soft. Thus, hard and moderately hard water were obtained from 65.9 per cent of all shallow wells reported from the county. Hard and moderately hard water wells were distributed throughout the county and within the various depths ranges. Of the 373 shallow wells from 0 to 50 feet deep, 74.3 per cent supplied hard or moderately hard water whereas water from 75 shallow wells, 150 to 200 feet in depth, was reported 46 per cent soft water, suggesting that water from deeper sources is commonly soft. The majority of shallow soft water wells were reported in the southern half of the county. Only one township, Twp. 20N., Rge. 17E., reported water from all wells as soft.

Of the 1033 wells reported, only 93 were reported as unsuitable for drinking, and 88 of these were shallow wells. A total of 53 unsuitable waters was reported from wells at depths ranging from 0 to 50 feet; 15 from 50 to 100 feet; 6 from 100 to 150 feet; and 14 from 150 to 200 feet. These unsuitable shallow wells are not restricted to particular localities and occur in all areas but four townships: Twp.13N., Rge.10E., Twp.18N., Rge.10E., Twp.21N., Rge.10E., and Twp.21N., Rge.11E., which reported 20 of the 88 unsuitable shallow wells. Approximately 24.7 per cent of the shallow wells listed from these townships were reported to supply unsuitable water.

The deep wells reported more soft waters than shallow wells, with 63.8 per cent reported soft; 24.5 per cent moderately hard, and 11.7 per cent hard. Waters at all depth ranges are variable from well to well, except those wells over 300 feet deep from which soft water was reported. Among the deep wells, 5 (4.9 per cent) were reported unsuitable for drinking.

Unsatisfactory drinking water is due in some cases to surface contamination, but is probably more commonly due to objectionable or disagreeable chemicals dissolved in the water. Injurious ingredients may occur in some cases but these can be determined only from adequate chemical analysis.

ADEQUACY OF WELL WATERS

Well water supplies were reported to be generally adequate for present needs in Perkins county. Needs vary however, and changes in land utilization, modification of farm management, or dry cycles in this and surrounding land areas, affect the need for water and in many cases the amount of water available.

Of the 1033 wells reported, only 121 were reported inadequate for current needs. Among the shallow wells, 113 (12.1 per cent) were reported inadequate and among the deep wells, 8 (7.8 per cent) were reported inadequate. Of the 113 inadequate shallow wells, 82 were from 0 to 50 feet in depth; 15 from 50

to 100 feet, 7 from 100 to 150 feet, and 9 from 150 to 200 feet. The shallow inadequate wells were distributed generally throughout the county. In Twp.13N., Rge.10E., four of the eight shallow wells reported, produce an insufficient supply of water.

Eight inadequate deep wells were scattered over the area with none, however, reported in the north quarter of the county. Township 13N., Rge.11E., reported two of three deep wells inadequate. Inadequate deep wells were reported to range from 225 to 300 feet in depth.

IRRIGATION

A total of 107 shallow wells were reported to be used to irrigate small plots, mostly garden plots, ranging in size from 1/8 to 1/2 acre, with one well, 143 feet in depth in Twp.20N., Rge.15E., irrigating a 40 acre tract, a total of 59 1/2 acres in all. Twenty three of the deep wells were used for irrigation, irrigating 6 1/4 acres ranging from 1/8 to 2 acres per well. Two springs were used to irrigate garden plots.

SUPPLEMENTARY SUPPLIES

Springs are a source of supplementary water supplies in Perkins county, 18 being reported over the area. Most of the springs were used for watering livestock. Some were located in areas where suitable and adequate supplies were not available, making them an important source of supplementary supplies. All of the springs were reported suitable for drinking; all were adequate (except one in Twp.17N., Rge.10E.) for present needs. Seven springs reported moderately hard water, and four reported soft water. Water from seven was used for domestic purposes. Following are the number and location of the springs reported from the county:

Twp.	Rge.	Number of springs	Twp.	Rge.	Number of springs
13N.	11E.	3	19N.	12E.	1
13	14	1	19	14	1
15	14	1	19	15	1
15	17	1	20	14	1
16	15	1	21	14	1
17	10	1	21	16	1
18	11	1	21	17	1
19	10	1	22	10	1

Fifty eight cisterns were reported from the county, approximately one cistern to every 20 wells. This relatively small proportion of cisterns suggests that they are not as important a source of supplementary supplies in Perkins county as in other counties where much water is too hard for laundry purposes. In Perkins county, 31 of the cisterns were used for cooking and drinking and 47 for laundry purposes. Most of the cisterns were used for soft water needs in hard water areas.

PERKINS COUNTY

Table 1.

DATA ON PUMPED WELLS FROM 0 TO 200 FEET (INCL.) IN DEPTH

LOCATION		Number of Wells	DEPTH OF WELLS			CHARACTER OF WATER					ADEQUACYOF SUPPLY			
Twp.	Rge.		Min.	Max.	Ave.	Hard	Med.	Soft	Corroded Casing	Unsuitable for Drinking	Adequate	Inade-quate	Number used for Irrigation	Approximate Acres Irrigated
13	10	8	12	125	32	2	4	2	-	4	4	4	-	-
13	11	8	18	152	50	-	6	1	-	2	6	2	1	1/4
13	12	10	7	117	32	3	2	5	-	1	9	1	1	-
13	13	8	16	190	65	1	6	-	-	2	4	4	2	1/2
13	14	10	15	105	38	2	5	3	-	1	9	1	2	1/8
13	15	7	14	160	42	2	3	2	-	-	7	-	-	-
13	16	6	14	160	70	-	2	4	-	-	5	1	1	1/8
13	17	11	30	136	91	-	4	7	-	-	11	-	2	5/8
14	10	15	22	193	69	3	3	9	1	1	13	2	2	1/4
14	11	9	12	140	52	1	2	6	1	1	8	1	3	-
14	12	10	9	200	78	-	7	2	-	-	9	1	4	7/8
14	13	8	10	160	50	1	-	7	-	1	7	1	1	1/8
14	14	2	20	120	70	1	-	1	-	1	2	-	-	-
14	15	4	30	123	53	-	3	1	-	-	4	-	1	1
14	16	6	16	175	92	-	1	5	-	-	5	1	-	-
14	17	3	20	160	66	2	-	-	-	-	2	1	-	-
15	10	11	8	180	50	2	6	2	1	2	8	3	-	-
15	11	11	10	160	97	1	4	4	-	-	11	-	-	-
15	12	5	18	180	58	-	2	3	1	1	5	-	1	1/8
15	13	9	7	175	59	-	5	4	-	-	7	2	1	1/4
15	14	6	10	165	99	1	2	3	1	2	6	-	1	1/1
15	15	6	14	60	41	1	2	2	-	-	3	3	1	1/4
15	16	3	28	125	71	-	1	2	-	-	2	1	-	-
15	17	5	18	118	54	1	1	3	-	-	5	-	-	-
16	10	16	10	175	77	2	5	8	-	1	15	1	4	7/8
16	11	19	12	165	75	1	10	8	1	-	19	-	1	1/8
16	12	11	12	175	79	2	4	5	-	1	8	3	1	1/8
16	13	7	16	74	37	2	-	4	1	-	6	1	3	1/2
16	14	10	9	200	56	2	5	3	-	1	9	1	-	-
16	15	6	12	150	47	-	1	5	-	-	5	1	-	-
16	16	6	9	70	24	2	2	2	-	-	6	-	-	-

PERKINS COUNTY

Table 1.

(Cont'd.)

DATA ON PUMPED WELLS FROM 0 TO 200 FEET (INCL.) IN DEPTH

LOCATION		Number of Wells	DEPTH OF WELLS			CHARACTER OF WATER					ADEQUACY OF SUPPLY			
Twp.	Rge.		Min.	Max.	Ave.	Hard	Med.	Soft	Corroded Casing	Unsuitable for Drinking	Adequate	Inade-quate	Number used for Irrigation	Approximate Acres Irrigated.
16	17	9	10	157	31	2	4	3	-	1	8	1	-	-
17	10	11	12	200	110	4	5	2	1	1	10	1	2	-
17	11	7	23	165	111	-	5	2	1	-	6	1	2	1/8
17	12	8	22	170	109	1	5	2	1	-	7	1	1	1/8
17	13	20	8	198	65	3	9	8	-	-	18	2	-	-
17	14	19	12	200	59	8	3	7	-	3	17	2	-	-
17	15	10	8	100	37	-	5	3	-	1	10	-	1	-
17	16	7	18	165	111	2	1	4	-	-	7	-	-	-
17	17	7	12	165	102	-	4	3	-	-	5	2	2	1/4
18	10	30	8	160	54	10	15	3	3	5	23	7	2	1/4
18	11	22	15	200	73	12	7	3	1	1	21	1	3	1/8
18	12	18	12	165	73	4	5	9	2	2	14	4	1	-
18	13	22	12	200	91	4	11	7	2	2	21	1	2	1/8
18	14	23	8	196	73	9	6	8	3	1	20	3	1	1/8
18	15	22	6	200	47	4	7	10	1	2	19	3	1	1
18	16	11	8	170	80	3	4	4	1	1	10	1	1	1/8
18	17	7	12	165	100	2	1	4	-	-	6	1	2	1/4
19	10	12	6	172	36	4	5	3	1	1	12	-	1	-
19	11	4	15	22	18	2	2	-	-	1	4	-	-	-
19	12	17	7	200	57	5	6	6	2	3	14	3	-	-
19	13	11	4	130	228	2	3	4	-	2	9	2	-	-
19	14	16	12	200	85	4	6	6	3	1	16	-	1	-
19	15	16	11	200	39	8	3	3	2	2	12	4	-	-
19	16	18	10	200	77	4	6	7	2	1	16	2	-	-
19	17	6	9	198	81	1	2	2	1	-	4	2	1	1/4
20	10	9	10	160	61	2	3	4	1	-	9	-	1	1/8
20	11	15	12	170	78	6	4	4	2	1	11	4	2	-
20	12	13	12	165	69	5	4	4	1	1	13	-	2	3/8
20	13	1	-	-	163	1	-	-	1	1	1	-	-	-
20	14	12	10	185	84	1	6	5	1	1	12	-	-	-
20	15	9	13	200	72	4	-	5	1	-	9	-	2	41

PERKINS COUNTY

Table 1.

(Cont'd.) DATA ON PUMPED WELLS FROM 0 TO 200 FEET (INCL.) IN DEPTH

LOCATION		Number of Wells	DEPTH OF WELLS			CHARACTER OF WATER					ADEQUACY OF SUPPLY			
Twp.	Rge.		Min.	Max.	Ave.	Hard	Med.	Soft	Corroded Casing	Unsuitable for Drinking	Adequate	Inade-quate	Number used for Irrigation	Approximate Acres Irrigated
20	16	7	6	200	92	2	3	2	-	-	7	-	1	-
20	17	3	140	170	155	-	-	3	-	-	3	-	1	-
21	10	23	15	200	101	9	9	4	-	4	21	2	4	1/2
21	11	27	14	198	64	10	14	2	3	7	23	4	7	2 1/2
21	12	17	6	166	42	4	10	3	2	2	17	-	3	5/8
21	13	1	-	-	87	1	-	-	-	-	1	-	-	-
21	14	10	13	142	46	6	3	1	1	2	10	-	2	1
21	15	18	11	190	44	7	6	5	1	1	15	3	2	1/4
21	16	10	14	180	73	2	3	5	-	1	9	1	3	1/2
21	17	6	10	110	44	1	1	4	1	-	4	2	-	-
22	10	21	12	165	74	9	8	4	3	1	21	-	5	5/8
22	11	9	15	141	42	1	2	6	-	-	8	1	-	-
22	12	8	15	141	81	3	2	3	-	1	8	-	-	-
22	13	2	16	125	70	2	-	-	-	1	2	-	1	1/8
22	14	27	12	200	79	10	13	3	4	4	26	1	4	1/2
22	15	15	9	170	49	1	13	1	1	-	13	2	-	-
22	16	17	9	185	64	5	8	4	3	1	12	5	1	1/8
22	17	14	12	95	40	3	7	2	-	2	11	3	3	-
23	10	1	-	-	20	-	1	-	1	-	-	1	-	-
23	14	7	40	80	65	4	1	2	3	2	6	1	3	2
23	15	9	30	180	86	4	2	3	-	1	7	2	1	-
23	16	8	82	200	142	3	1	3	1	1	8	-	1	-
23	17	3	25	194	122	-	3	-	-	-	2	1	1	1/8
Total		931				239	355	308	65	88	818	113	107	59 1/2

PERKINS COUNTY

Table 2.

DATA ON PUMPED WELLS OVER 200 FEET IN DEPTH

LOCATION		Number of Wells	DEPTH OF WELLS			CHARACTER OF WATER					ADEQUACY OF SUPPLY			
Twp.	Rge.		Min.	Max.	Ave.	Hard	Med.	Soft	Corroded Casing	Unsuitable for Drinking	Adequate	Inade-quate	Number used for Irrigation	Approximate Acres Irrigated
13	11	3	226	280	252	-	-	3	2	-	1	2	-	-
13	12	2	-	-	250	-	1	1	-	-	2	-	1	1/8
13	17	1	-	-	240	-	-	1	-	-	1	-	1	1/8
14	11	2	215	253	234	-	-	2	-	-	2	-	-	-
14	15	1	-	-	205	-	-	1	-	-	1	-	-	-
15	11	1	-	-	220	-	1	-	-	-	1	-	-	-
15	12	1	-	-	292	-	1	-	-	-	1	-	-	-
15	13	2	206	248	227	-	-	2	-	-	2	-	1	-
15	14	2	203	380	306	-	2	-	-	1	2	-	1	2
15	15	2	250	290	270	-	-	2	-	-	1	1	1	1/4
16	10	2	211	230	220	1	1	-	-	-	2	-	-	-
16	13	1	-	-	213	-	-	1	-	-	1	-	1	1/4
16	14	4	220	280	252	-	-	4	-	-	4	-	3	1/2
16	15	1	-	-	232	-	-	1	-	-	1	-	1	1/8
17	10	1	-	-	220	-	-	1	-	-	1	-	-	-
17	11	1	-	-	225	-	1	-	-	-	1	-	-	-
17	12	1	-	-	350	-	-	1	1	-	1	-	-	-
17	13	3	201	372	258	-	-	3	-	-	3	-	-	-
17	14	4	204	300	251	-	1	3	-	-	4	-	2	3/8
17	15	2	222	250	236	-	1	1	-	-	2	-	-	-
17	16	4	220	237	227	2	1	1	1	1	4	-	1	-
18	10	2	208	266	237	-	2	-	-	-	2	-	-	-
18	11	1	-	-	300	-	1	-	-	-	1	-	-	-
18	12	2	300	306	303	1	-	1	1	-	2	-	-	-
18	13	3	250	350	303	1	1	1	-	-	3	-	-	-
18	14	3	204	280	248	-	1	2	-	-	3	-	1	1/8
18	15	9	204	375	267	2	-	7	3	-	8	1	4	1 1/2
18	16	9	225	358	278	2	3	4	1	2	7	2	-	-
19	11	1	-	-	249	-	-	1	-	-	-	1	-	-
19	14	3	218	260	233	-	1	2	-	-	2	1	-	-
19	15	5	215	350	284	2	1	2	1	1	5	-	1	1/8
19	16	7	208	300	272	-	1	6	-	-	7	-	1	1/8

PERKINS COUNTY
Table 2.
(Cont'd.) DATA ON PUMPED WELLS OVER 200 FEET IN DEPTH

LOCATION		Number of Wells	DEPTH OF WELLS			CHARACTER OF WATER					ADEQUACY OF SUPPLY			
Twp.	Rge.		Min.	Max.	Ave.	Hard	Med.	Soft	Corroded Casing	Unsuitable for Drinking	Adequate	Inade-quate	Number used for Irrigation	Approximate Acres Irrigated
20	14	1	-	-	215	-	-	1	-	-	1	-	-	-
20	16	2	236	270	253	-	1	1	-	-	2	-	1	-
20	17	1	-	-	240	-	-	1	-	-	1	-	-	-
21	10	5	203	268	239	-	1	4	-	-	5	-	1	1/2
21	11	1	-	-	1008	-	-	1	-	-	1	-	-	-
21	15	2	210	216	213	1	-	1	1	-	2	-	-	-
21	16	1	-	-	250	-	-	1	-	-	1	-	-	-
22	17	1	-	-	215	-	1	-	1	-	1	-	1	1/8
23	16	2	220	240	230	-	1	1	-	-	2	-	-	-
Total		102				12	25	65	12	5	94	8	23	6 1/4

Note: No Pumped Wells over 200 feet in depth reported from the following townships and Ranges: T.13N., R.10, 13, 14, 15, 16E; T.14N., R.10, 12, 13, 14, 16, 17E; T.15N., R.10, 16, 17E; T.16N., R.11, 12, 16, 17E; T.17N., R.17E; T.18N., R.17E; T.19N., R.10, 12, 13E; T.20N., R.10, 11, 12, 13, 15E; T.21N., R.12, 13, 14, 17E; T.22N., R.10, 11, 12, 13, 14, 15, 16E; T.23N.,R.10, 14, 15, 17E;

Note: No Flowing Wells Reported from Perkins County

PERKINS COUNTY WELL NOTES

The following are pertinent remarks quoted from questionnaires returned by farmers and are included opinions of the water situation as expressed by the individual farmers and must be so applied.

Twp.13N.,Rge.10E. Sec. 15
30 feet:
"The difficulty in obtaining water is not sufficient water on the first strata,also unable to go through soapstone by digging. No funds also."

Twp.13N.,Rge.12E. Sec. 18
18 feet:
"In regards to difficulties in digging wells on my place, met in the shape of quicksand, and cave-ins. On account of this, I have had trouble in securing enough water the winter of 1935. Otherwise there is an abundance of water. At the time I dug this well I curbed it to the bottom, the depth then was 15 ft. Have had to go a little deeper since on account of lowering water as the well is not all cased and of such small diameter it is hard to work more casing in."

Twp.13N.,Rge.13E. Sec. 26
20 feet:
"This well is located only a few feet on the lowest bench on Tully creek. This well supplied an abundance of water in the early days. We used it beginning in 1928 to 1931 when it started failing. In 1932, I dug a well, only a few feet from this one, but on the first bench on the creek bed."

Twp.13N.,Rge.13E. Sec. 26
16 feet:
"This well is located on the lowest bench on Tully creek. Am not furtunate enough to have a drilled well on my unit. Have tested over 5 sections the past 3 yrs., a good vein of water at a shallow depth and have not been successful."

Twp.13N.,Rge.14E. Sec. 8
14 feet:
"Coal."

Twp.13N.,Rge.17E. Sec. 6
125 feet:
"Our trouble with former wells which we dug would seep through the wooden casing and boil up from the bottom.This was eliminated by casing from top to bottom. This sand was encountered at 20 ft. We had trouble for years. One other deep well on the ranch but the description is identical with the first."

Twp.14N.,Rge.10E. Sec. 4
22 feet:
"Wells are very easily constructed on this place as it is only a short distance to water and an unlimited supply is available. The only problem is cost of casing sufficient in size to do any amount of irrigating."

Twp.14N.,Rge.10E.
Sec. 26

42 feet:
"Have bored 3 holes with hand test auger to a depth of 30 feet without striking any water. These test wells were bored along the edge of a draw where my present well is located. The well I am using is dug by hand to a depth of 20 ft. and the rest of the way with a post auger to the depth of 22 ft."

Twp.14N.,Rge.11E.
Sec. 2

12 feet:
"Will state that water for domestic use and for livestock is the least of my trouble. I have a private dam, never been dry. I have two wells, one near the house, one near the barn. Both shallow dug wells of good soft water. Both furnish more if dug deeper, but the water is not needed now."

Twp.14N.,Rge.13E.
Sec. 31

18 feet:
"This well is used for stock only and has watered as high as thirty cows. But never had to use it for watering the stock I had around the buildings as I have three miles of river which is my main source of water. We hit water in quicksand and have went down about 4 ft. in quicksand and cannot get through it as the water comes in too fast, but when pumping it pumps sand all of the time and can hardly keep any leathers in the pump. Would appreciate any information you could give on getting through this sand to a hard surface bottom."

Twp.15N.,Rge.10E.
Sec. 13

12 feet:
"I have a well which I use for drinking purposes only. It is about 15 ft. south of my stock well. It is 12 ft. deep and 2 ft. in diameter. It is about 5 feet to the water. It is in the same vein as the other well. I think a good well could be drilled on this place at about 100 to 125 ft."

Twp.15N.,Rge.12E.
Sec. 17

180 feet:
"We have tried digging wells but could not dig deep enough."

Twp.15N.,Rge.13E.
Sec. 27

206 feet:
"Well can be lowered to 60 ft. from top and from there we could not lower the water any more."

Twp.15N.,Rge.13E.
Sec. 34

127 feet:
"Years before I had this well drilled, I had lots of shallow wells they held up at first but soon went dry as the county did, and I filled them up."

Twp.15N.,Rge.14E.
Sec. 12

10 feet:
"I think I have a good prospect for an artesian well if I would drill down and dig deep enough. There are 2 artesian about two miles up the creek from me. My place has good active springs on it. I expect to utilize them when I am able to."

Twp.15N.,Rge.14E.
Sec. 20

100 feet:
"Quicksand."

Twp.15N.,Rge.15E. Sec. 23
14 feet: (Quicksand)
"I have had trouble in getting a big enough reservoir to water on account of quicksand. Well has been in use 35 years. But at present, does not furnish very much water. This water is very hard and a great amount of soda or alkali in it."

Twp.16N.,Rge.10E. Sec. 26
136 feet:
"This well watered 500 head of stock one winter but never seemed to lower it. This well dug in 1916 and they had to case out quicksand at 40 ft. On the tank it gathers a lot of white in the summer time. It is not alkali, some neighbors suggest soda, I do not know."

Twp.16N.,Rge.12E. Sec. 14
18 feet:
"Not enough water to be had at 100 ft.and too hard to bore or dig through sandstone. Should get water at 150 ft."

Twp.16N.,Rge.13E. Sec. 24
51 feet:
"Blue mud - 6 ft. The difficulty experienced here in digging wells was caused by the fine sand,which ran in faster then it could be taken out, 16 ft. down from the surface. By casing this sand out, with a larger casing, then the drilled hole, we overcome the difficulty.

Twp.16N.,Rge.13E. Sec. 29
26 feet:
"We blasted the sand rock with dynamite after digging 15 ft. The lower well is cased with rock, the upper part is cased with brick and cement.Good well and excellent water."

Twp.16N.,Rge.16E. Sec. 24
14 feet:
"Difficulties in constructing wells caused by quicksand."

Twp.17N.,Rge.11E. Sec. 9
225 feet:
"Blue sand."

Twp.17N.,Rge.12E. Sec. 17
170 feet:
"I could not estimate the amount per minute in gallons or barrels but it has never went dry. There has been two hand dug wells,one 70 ft. deep and one shallow one in the draw, which was filled up when we drilled this one nearly 20 yrs. ago. Our windmill has a control by the wind, which shuts off by itself when the wind blows hard. I do not know if its sand or gravel, but its real soft and good to drink."

Twp.17N.,Rge.12E. Sec. 26
150 feet:
"I have a section of land on which I have built a dam and it don't produce any water. It is a 800 or 900 yard dam. I have worked two years on this dam without any success."

Twp.17N.,Rge,13E. Sec. 2
28 feet:
"Coal."

Twp.17N.,Rge.13E. Sec. 2
15 feet:
"Coal."

Twp.17N.,Rge.13E. Sec. 12
24 feet:
"Coal."

Twp.17N.,Rge.14E. Sec. 9	159 feet: "The water in this well contains some soda or alkli."
Twp.17N.,Rge.14E. Sec. 22	100 feet: "The tract of land which I own has a well but as the land has no buildings the well is not being used for any purpose,although the well contains plenty of good soft water."
Twp.17N.,Rge.14E. Sec. 34	25 feet: "We watered 600 head of sheep from this well this year but will not water more than 60 head of cattle in a dry year. Water is fit for domestic use, but we do not have to use it as we also have the drilled well of soft water."
Twp.18N.,Rge.10E. Sec. 8	30 feet: "Coal."
Twp.18N.,Rge.10E. Sec. 23	156 feet: "Medium blue sand."
Twp.18N.,Rge.11E. Sec. 2	43 feet: "There is coal in well that spoils water. Have wanted to test for oil."
Twp.18N.,Rge.13E. Sec. 27	14 feet: "Hard clay."
Twp.18N.,Rge.14E. Sec. 1	52 feet: "Shale."
Twp.18N.,Rge.15E. Sec. 3	14 feet: "Gumbo."
Twp.18N.,Rge.15E. Sec. 24	375 feet: "This well was drilled in 1929. Driller claimed he did not strike a strong flow of water until he came to present depth of 375 ft. The water came to within 75 to 100 ft. of the top. It was then tested and could not be pumped dry using the 1½ in. piping and 2 in. cylinder. This well has never gave any trouble was pulled once to replace pump rod just above the cups in cylinder where the water has corroded, and then it gave away. The water gets rusty at times, with a red rusty sediment. There is a trace of alkali or soda as can be noticed where water has stood for some time."
Twp.18N.,Rge.16E. Sec. 10	8 feet: "Coal."
Twp.18N.,Rge.16E. Sec. 19	170 feet: "Conditions of the water in this well is so full of alkali it is red and almost thick of sediment at times. Have hauled drinking water for the house for more than 12 years."
Twp.19N.,Rge.10E. Sec. 20	18 feet: (hard shale) "I have been having trouble getting good drinking water on my farm. I cannot get enough stock water."

Twp.19N.,Rge.11E. Sec. 4	22 feet: "The well described on opposite side when used last, was capable at watering around 1000 sheep. That was year before last. Quicksand is the biggest handicap,but I believe a good pipe casing will do the trick."
Twp.19N.,Rge.14E. Sec. 25	14 feet: "Plenty of water for stock in springs,dams,and coal veins."
Twp.19N.,Rge.14E. Sec. 31	260 feet: "I have a good spring on my farm, that furnishes plenty of water. Flows the year around. Hard water, flows 2 gallons per minute. The well is no good."
Twp.19N.,Rge.15E. Sec. 7	12 feet: "We are unable to get anthing but alkali water with dug wells."
Twp.19N.,Rge.15E. Sec. 13	350 feet: "This well fails to operate at all now. Perhaps its the pipes or needs to be cleaned. But it has always flowed plenty. It is very good soft water."
Twp.19N.,Rge.15E. Sec. 27	"In regards to water on this farm, its poor. Have to haul all of the water used for the house, about 2 miles. For two summers I had to haul for the stock for a couple of months. As I got tired of that, had to cut down on my stock. There is a lakebed near the well, if we had normal rainfall we would get along except for the house as its not fit for drinking. There is a deep drilled well at the middle of the section but that is bone dry since coming here in 1933."
Twp.19N.,Rge.15E. Sec. 25	10 feet: "Coal."
Twp.19N.,Rge.17E. Sec. 30	9 feet: "Coal. This well has never been recased."
Twp.20N.,Rge.11E. Sec. 1	116 feet: "This well was dug by a machine and always had plenty of water for the stock and home use and irrigation of the garden. The well has never gone dry. The water is hard and corrodes the pipe, it is pumped by windmill with a 2 in. cylinder and sometimes runs night and day and never runs dry."
Twp. 20N.,Rge.11E. Sec. 5	158 feet: "I have also a dug well about 15 ft. deep with plenty of hard water for stock.The well we use for domestic purposes from a coal vein. When ever we pump too much at a time, the quicksand comes up. The water will be dirty for several days but I do not know what to do for it, unless go deeper."

Twp.20N.,Rge.12E, Sec. 21	14 feet: "Just a few words about the water veins on this place.They are very strong and unlimited as to water.There are numerous springs along the creek that never stops running."
Twp.20N.,Rge.11E. Sec. 34	30 feet: "The water in the well described is very hard and has a bitter taste, we have two cisterns,one we use for laundry, and one for drinking and cooking. I have tested at several places but it all tastes bitter. Creek runs through our place which provides water for the stock. We have never had a drilled well."
Twp.20N.,Rge.14E. Sec. 9	Spring. "There are several springs on this land."
Twp.20N.,Rge.14E. Sec. 34	32 feet: "Coal."
Twp.20N.,Rge.14E. Sec. 34	15 feet: "Gravel and coal."
Twp.21N.,Rge.10E. Sec. 16	286 feet: "The trouble in constructing wells is the depth and the fine sand, which covers up easily."
Twp.21N.,Rge.15E. Sec. 13	30 feet: "Blue clay."
Twp.21N.,Rge.15E. Sec. 22	190 feet: "Blue shale."
Twp.21N.,Rge.15E. Sec. 22	21 feet: "Clay bottom."
Twp.22N.,Rge.10E. Sec. 23	3 feet: "Coal."
Twp.22N.,Rge.11E. Sec. 30	38 feet: "Coal bottom."
Twp.22N.,Rge.12E. Sec. 32	141 feet: (Quicksand.) "Quicksand runs in filling up the well so that now we only have 4 ft. of water in well. Can't keep the quicksand pumped out."
Twp.22N.,Rge.14E. Sec. 20	120 feet: "I am not quite sure as to the depth of the well but I do know it has plenty of water. I have had the windmill running day and night for as long as 3 days at a time and it never went dry. Had 20 head of cattle here all summer.Had plenty of water."

Twp.22N.,Rge.15E. Sec. 33	Filled in. "This well was dug by hand, 22 ft. deep, with about 2 ft. of water. I only used it while I was homesteading. I dug this well in a draw. I am satisfied I would have to go deeper to get any amount of water. I went through clay and coal. I think the water was in a coal vein. I am satisfied that it would be easier to get water on other locations on my land, as this was on the highest part of the land."
Twp.23N.,Rge. 14E. Sec. 33	73 feet: "Coal."
Twp.22N.,Rge.16E. Sec. 24	185 feet: "Surface water rotten. Almost red as blood in pipes. Red sediment collects in cylinder. Not fit for stock. This was cased off at 100 ft. with steel casings. Deeper vein is OK, soft, not plentiful. Steel casing rusted through letting in surface water. Stock watered from dam on creek. Water for home use carried one mile."
Twp.23N.,Rge.17E. Sec. 34	25 feet: "Hard blue clay."
Twp.18N.,Rge.13E. Sec. 13	130 feet: "Gumbo."

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