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Rural Water Supplies in South Dakota : Miner County

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Rural Water Supplies in South Dakota

MINER County

January, 1940
Special Extension Circular
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RURAL WATER SUPPLIES

IN

SOUTH DAKOTA

MINER COUNTY

BY

WALTER V. SEARIGHT

AND

ELMER E. MELEEN

PREPARED BY THE WORK PROJECTS ADMINISTRATION
AS A REPORT ON THE WELL SURVEY CONDUCTED
AS WORK PROJECTS ADMINISTRATION OFFICIAL PROJ-
ECT 665-74-3-126; SPONSORED BY THE EXTENSION
SERVICE AND THE EXPERIMENT STATION SOUTH DAK-
OTA 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. Searight.

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 conscientious assistance of Mr. E. L. Woodburn, Supervisor, for careful and painstaking supervision of statistical work. The authors also desire 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.

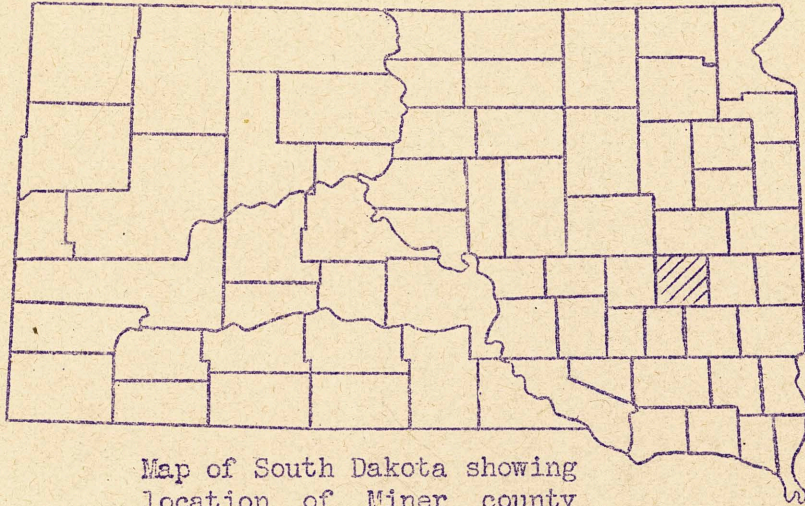
SUMMARY OF STATE SUPPLIES

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.

Miner County

Miner county lies in the southeastern part of South Dakota. It is bounded on the north by Kingsbury county, on the east by Lake county, on the south by Hanson and McCook counties, and on the west by Sanborn county.



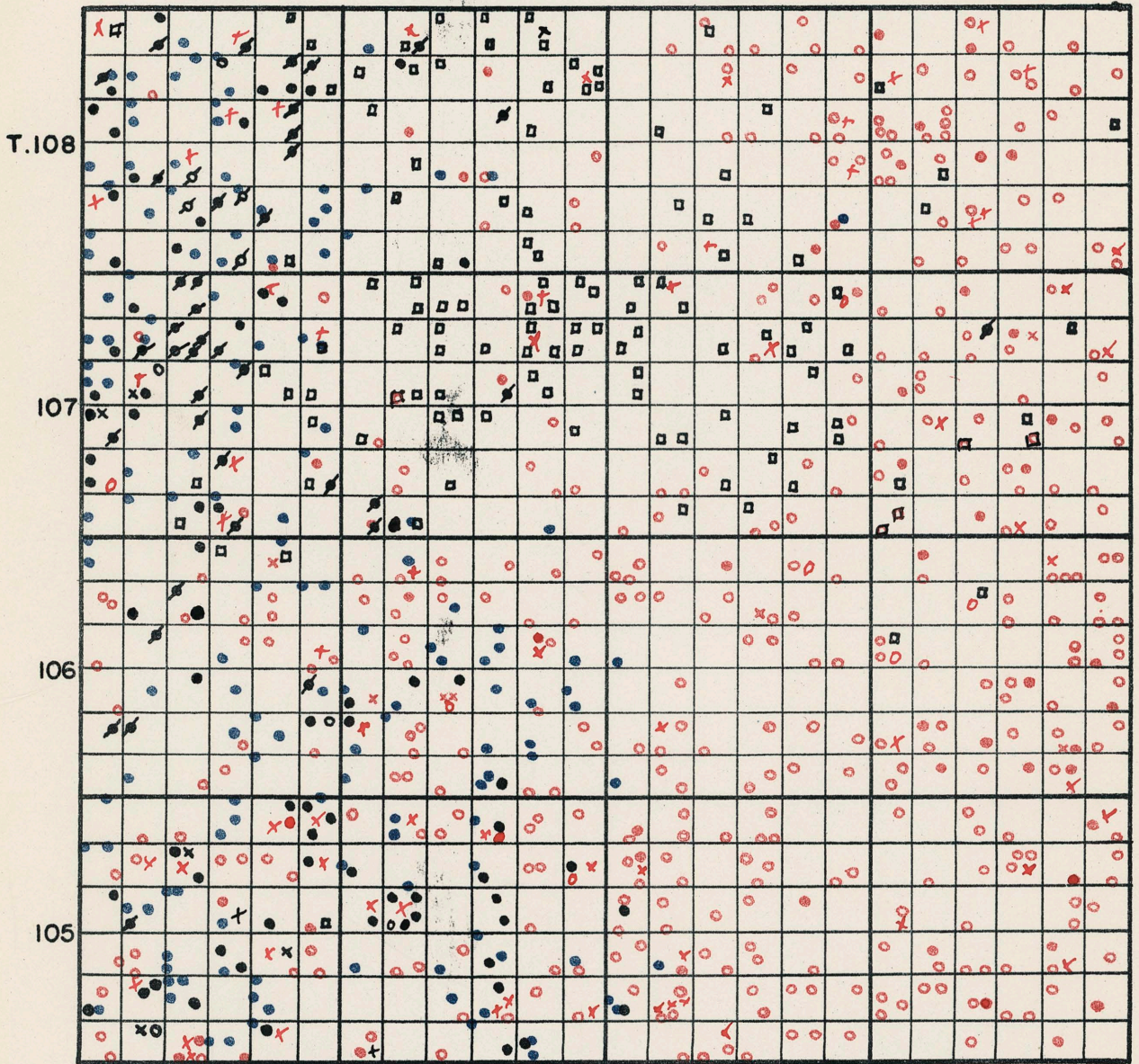
Map of South Dakota showing location of Miner county

The greater portion of the county is in farms, and 91.3 per cent, or 331,854 acres out of a total of 363,520 acres in the county, are devoted to farming. The farmed area is divided into 1,229 farms of an average sized farm unit in the county of 270 acres. Total crop land acres total 247,285 acres; plowable pasture acres 53,437; woodland pasture acres 485; and all other pasture acres total 16,998. A small area of woodland acres, 657 acres, are not pastured but all other land in farm acreage equals 12,992 acres. Corn, barley, oats, rye, and spring wheat are the important field crops, being produced in the order named. Livestock is also important with cattle, sheep, hogs, horses and mules being produced in the order named. Dairy products are increasingly important.*

Farm acreage devoted to livestock and dairy cattle requires generally distributed sources of water supply in the county. Supplies required are not great, but adequate and constant supplies of suitable water at relatively low cost are necessary to operate farms of these sizes and organization profitably.

*South Dakota Agricultural Statistics, Annual Report, 1937

LOCATION OF ARTESIAN AND SHALLOW WELLS IN MINER COUNTY
R.58 57 56 55



- | ARTESIAN WELLS | | SHALLOW WELLS | |
|----------------|------------------------------------|---------------|--------------------------|
| O | FLOWING-WELLS—STEADY OR INCREASING | ○ | ADEQUATE SUPPLY |
| ● | FLOWING WELLS- DECREASED FLOW | ● | INADEQUATE SUPPLY |
| X | CEASED FLOWING | X | DRY WELLS |
| □ | PUMPED | □ | SPRINGS |
| / | CONTROLLED WELLS | | |
| | ∅ | | |
| | | | ● |
| | | | WELLS FROM OTHER SOURCES |

On the well location map of Miner county, all flowing and all deep pumped wells obtaining water from the Dakota-Lakota sandstones are shown in black as artesian wells. All other wells are shown in red and are called shallow wells regardless of depth. On all other maps and in the tables and text of this report, the term shallow wells is applied to all wells 200 feet or less in depth, and those greater than 200 feet are treated as deep wells including all artesian wells except flowing wells less than 200 feet in depth, unless otherwise stated.

Questionnaires returned from Miner county were a 48.6 per cent coverage with returns on 635 wells, an average of 39.7 per township, or 1.1 per square mile.

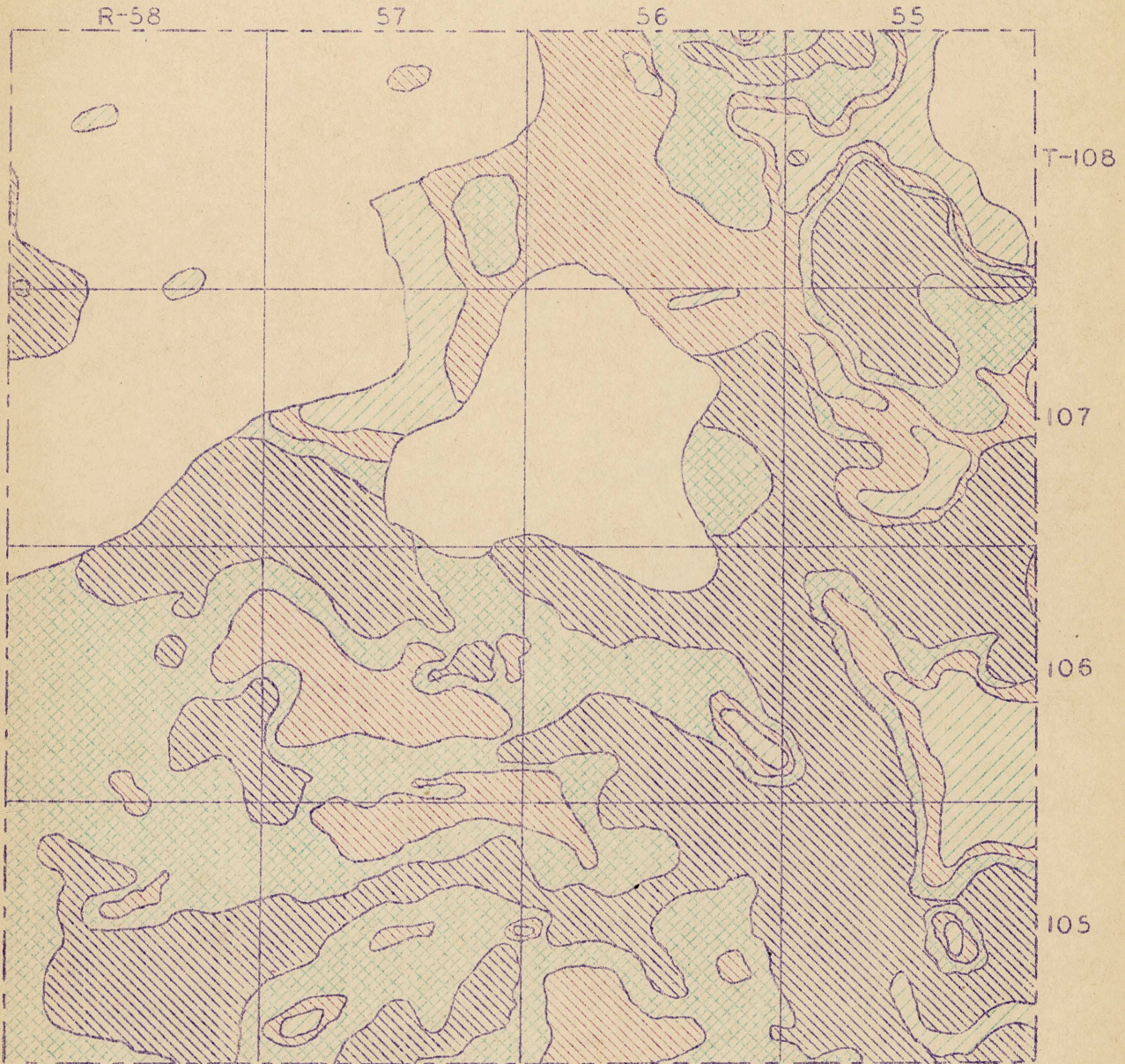
DEPTH AND DISTRIBUTION

Shallow wells: Somewhat less than half of the wells of Miner county are shallow wells according to reports by farmers. Two hundred ninety, or 45.7 per cent of the wells reported, were shallow wells. Forty seven, or 19.4 per cent of the shallow wells reported were between 0 and 50 feet deep; 37 or 15.3 per cent between 50 and 100 feet; 67 or 27.7 per cent from 100 to 150 feet; and 91 or 37.6 per cent from 150 to 200 feet. Thus, slightly less than 35 per cent of shallow wells were less than 100 feet deep, with 65 per cent reported within the 100 and 200 foot depth interval.

The greatest percentage of shallow wells were reported from T.105N., R. 56W., where 85.7 per cent were reported; and T.106N., R.57W., was next with 83.3 per cent shallow. In 10 townships the number of shallow wells exceeded the number of deep. The greatest difference was noted in T.105N., R.56W., which reported 42 shallow and only 7 deep wells. The percentage of wells which were reported shallow and deep are tabulated below by townships:


Twp.	Rge.	Number Shallow	Per cent Shallow	Number Deep	Per cent Deep
108N	56W	19	65.5	10	34.5
107	55	32	74.4	11	25.6
106	53	18	60.	12	40.
106	57	30	83.3	6	16.7


MINER COUNTY





SHALLOW WELLS (0-200 FT)

DEPTHS AT WHICH SUPPLIES ARE COMMONLY OBTAINED

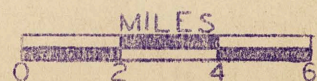
 0-50 FT

 100-150 FT

 50-100 FT

 150-200 FT

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(continued)

Twp.	Rge.	Number Shallow	Per cent Shallow	Number Deep	Per cent Deep
106N	56W	20	62.5	12	37.5
106	55	26	55.3	21	44.7
105	58	22	51.2	21	48.8
105	57	29	78.4	8	26.6
105	56	42	85.7	7	14.3
105	55	22	53.7	19	46.3

Township 108N., R.58W., reported the smallest percentage of shallowwells, only 5.6 per cent (2). Township 108N., R.55W., reported 50 per cent of the wells shallow.

Deep wells: Wells more than 200 feet deep were 54.3 per cent of the total number of wells reported. Of these, 231 or 36.4 per cent of the 635 wells reported were classified as deep pumped. These ranged in depth from 202 to 1200 feet. With the exception of one well each in T.105N., R.56W., and T.107N. R.55W., the eastern half of the county reported no flowing wells. The majority were located in the four townships bordering on the western boundary.

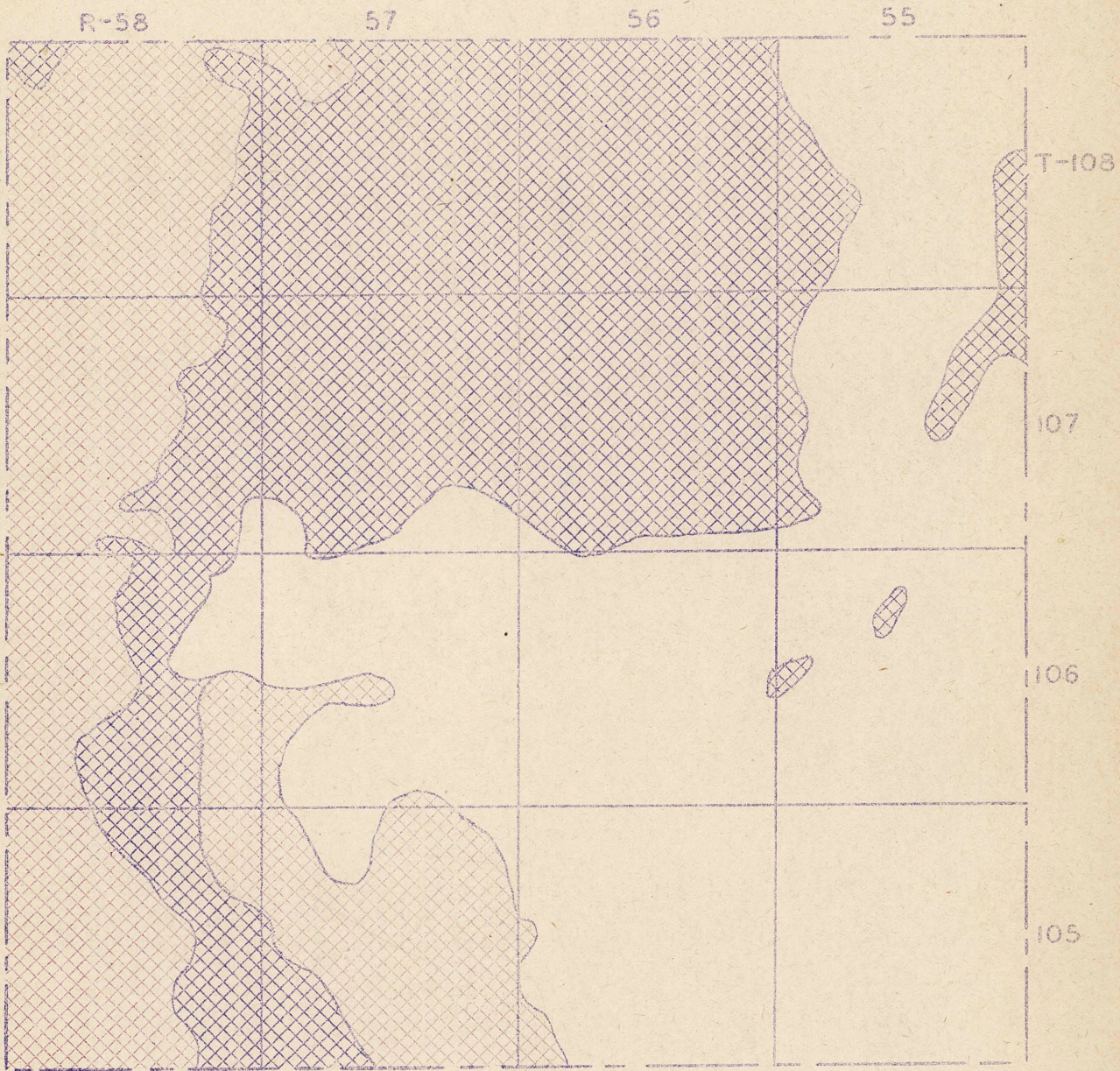
Township 108N., R.58W., reported nearly 95 per cent of the wells to be deep wells, followed by township 107, ranges 58 and 57 reporting 88.6 per cent and 87.2 per cent respectively. Township 107N., R.56W., reported 81.4 per cent and T.108N., R.57W., 77.1 per cent. The percentage of deep wells in each township are tabulated in the preceding table.

CHARACTER OF WELL WATERS


In order to determine the character of water in the county, users were asked to indicate whether they considered the water to be hard, moderately hard, or soft. Shallow wells in general were hard, with 63.6 per cent reported as hard, 30.4 per cent moderately hard, and only 6.1 per cent soft. Approximately 94 per cent were definitely or moderately hard. About one out of every 9 1/2 (9.7) wells was considered unsuitable for drinking.


Deep pumped wells, on the other hand, include a very considerable number of soft water wells, with 44 per cent hard, 20.6 per cent moderately hard and 35.4 per cent soft. Thus, 56 per cent were reported soft or only moderately

ARTESIAN AREAS 1938



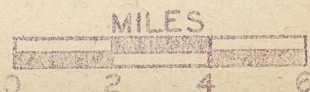
MINER COUNTY

 FLOWING WELLS

 PUMPED WELLS



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hard. Fourteen, or one of every 16 1/2 deep pumped wells, were considered unsuitable for drinking.

Flowing wells, again, in many cases, produce soft water. Among the flowing wells, 29.3 per cent were reported hard, 12.3 per cent moderately hard, and 58.5 per cent soft. Only three, or one of every 38, were reported unsuitable for drinking. Thus, most deep well waters are suitable for drinking.

ADEQUACY OF SUPPLY

Most wells (87.7 per cent) in Miner county were considered adequate for current farm needs. Needs vary, however, and present supplies, especially from shallow sources, are likely to prove inadequate during dry cycles in this or surrounding land areas.

Shallow wells were 86.6 per cent adequate, with two townships all wells adequate, (T.106N., R.56W., and T.107N., R.56W.). In all townships, the adequate exceed the inadequate. An average of about one of every 6.4 wells was inadequate. Two hundred six of the 231 deep pumped wells reported nearly 90 per cent adequacy. Thus approximately one of every 8.3 wells of all types are inadequate. The following five townships reported all wells adequate; T.106N. R.57W., T.107N., R.58W., T.108N., R.56W., T.108N., R.57W., T.108N., R.58W.

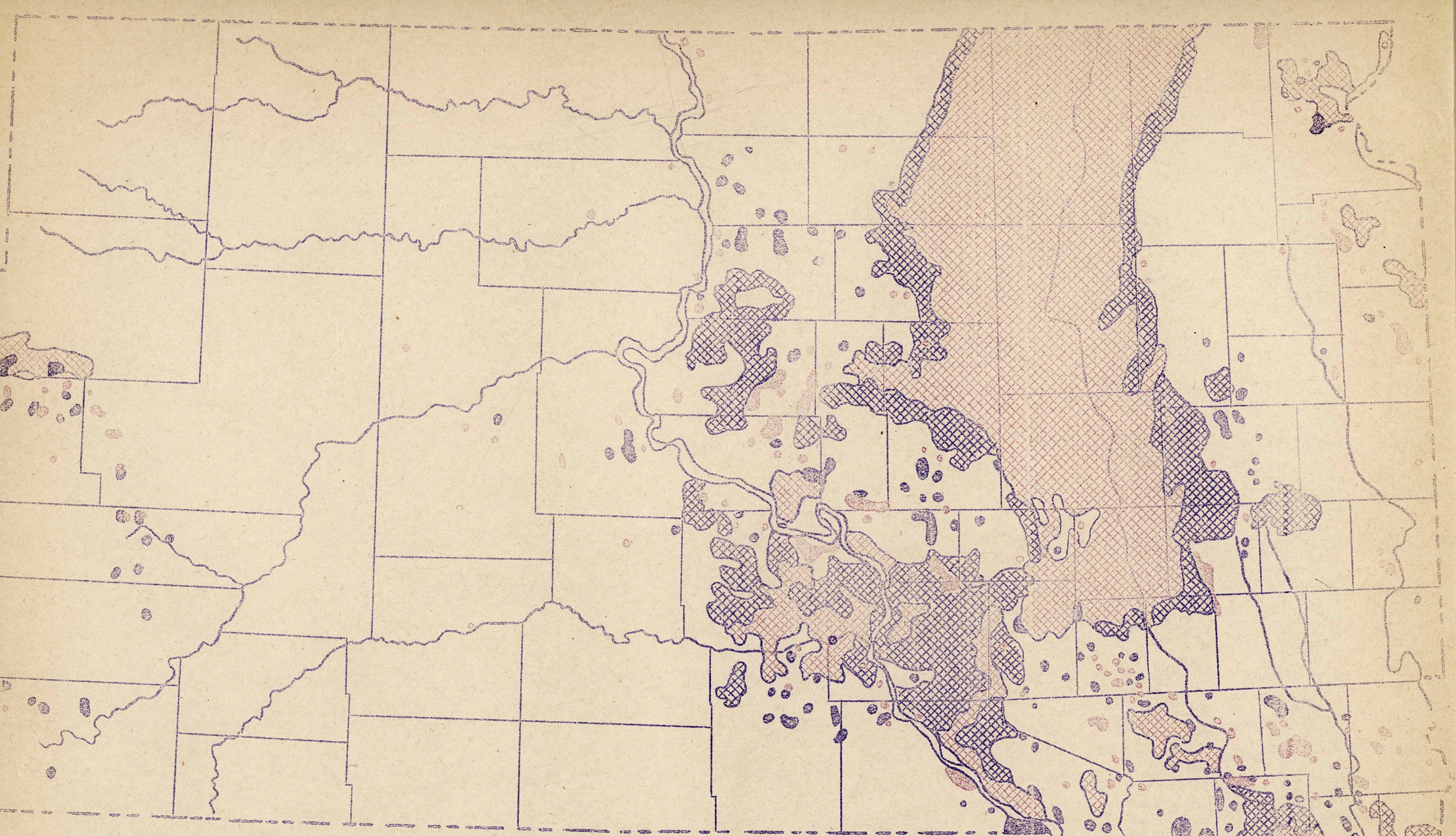
One hundred, or 87.7 per cent of flowing wells were reported as adequate and 14 inadequate. Three townships reported all flowing wells adequate. Flowing wells were reported in the following townships:

T.105N., R.56W. (1) T.106N., R.57W. (4) T.108N., R.57W. (4)

Township 107N., R.55W., reported one flowing well which was inadequate. Twenty six were reported to be equipped with control valves. The average flow was reported to vary from .75 to 8.1 gallons per minute.

IRRIGATION





A total of 17 shallow wells were used for irrigating 1 3/4 acres. Eight



ARTESIAN AREAS OF SOUTH DAKOTA

1938

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  FLOWING WELLS
  PUMPED ARTESIAN WELLS

deep wells were used for the irrigation of $4 \frac{1}{8}$ acres.

SUPPLEMENTARY WATER SUPPLIES

In any area where much of the well water is hard, cisterns are an important supplementary water supply. Cisterns are thus very important in Miner county. A total of 316 were reported. This number of cisterns exceeds the number of shallow wells by six, the deep pumped by 85 and the flowing by 102. Township 108N., R.55W., reported most cisterns with about two to every three wells. Township 108N., R.58W., reported the lowest percentage of cisterns to wells and cisterns, 5.3 per cent. The importance of cisterns for laundry purposes where the well water is hard, is clearly indicated in the townships reporting maximum and minimum percentages of cisterns. Shallow waters are hard in T.108N., R.55W., 50 per cent of the wells were shallow wells, whereas in T.108N., R.58W., 5.6 per cent were reported shallow wells. Similarly other townships report many cisterns where there was a high percentage of shallow wells. The table which follows shows the number of wells and cisterns in each township and the percentage of cisterns:

Twp.	Rge.	Number of Wells	Number of Cisterns	Per cent of Cisterns
105N	55W	41	29	41.4
105	56	49	25	33.8
105	57	37	20	35.1
105	58	43	22	33.8
106	55	47	33	41.3
106	56	32	22	40.7
106	57	36	18	33.3
106	58	30	13	30.2
107	55	43	30	41.1
107	56	43	23	34.9
107	57	47	14	22.9
107	58	44	4	8.3
108	55	42	33	44.
108	56	29	21	42.
108	57	35	7	16.7
108	58	36	2	5.3

No springs were reported from Miner county.

MINER 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					ADEQUACY OF SUPPLY			
Twp.	Rge.		Min.	Max.	Ave.	Hard	Med,	Soft	Corrode Casing	Unsuitable for Drinking	Adequate	Inade-quate	Number used for Irrigation	Approximate Acres Irrigated
105	55	22	12	200	113	7	13	1	4	2	18	4	-	-
105	56	41	70	190	133	24	15	-	9	3	38	3	6	1/4
105	57	17	18	186	108	7	9	-	2	-	16	1	4	1 1/8
105	58	19	87	200	144	11	6	-	4	2	15	4	-	-
106	55	26	8	200	127	16	8	1	5	2	21	5	1	-
106	56	20	28	200	150	13	6	1	1	3	20	-	1	-
106	57	28	80	200	139	19	8	-	4	1	26	2	2	1/4
106	58	16	70	180	139	13	1	2	3	1	15	1	-	-
107	55	32	9	200	119	25	7	-	8	3	27	5	-	-
107	56	8	8	180	96	4	1	2	-	1	8	-	1	-
107	57	6	9	200	88	3	-	2	1	1	4	2	-	-
107	58	5	150	200	180	1	1	3	-	1	4	1	-	-
108	55	21	7	200	91	14	6	1	2	3	16	5	1	1/8
108	56	19	8	180	97	13	4	2	5	4	17	2	1	-
108	57	8	20	140	70	6	-	2	1	3	5	3	-	-
108	58	2	25	40	33	2	-	-	-	-	1	1	-	-
Total		290				178	85	17	49	30	251	39	17	1 3/4

MINER 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	Inadequate	Number used for Irrigation	Approximate Acres Irrigated
105	55	19	208	342	226	15	3	1	5	1	16	3	3	1/4
105	56	7	250	360	285	4	3	-	1	-	6	1	1	1/4
105	57	7	210	350	273	3	4	-	-	1	6	1	3	1/8
105	58	8	202	600	361	7	1	-	2	1	5	3	-	-
106	55	21	202	408	273	14	6	-	6	3	16	5	-	-
106	56	12	213	296	240	5	7	-	1	-	11	1	5	1/2
106	57	4	240	400	288	4	-	-	1	-	4	-	-	-
106	58	3	525	600	562	2	-	-	1	-	2	1	-	-
107	55	10	206	585	444	5	3	2	1	1	6	4	-	-
107	56	35	210	1100	513	9	8	18	3	1	31	4	3	1/2
107	57	37	300	1200	578	11	4	18	9	-	36	1	2	1/8
107	58	9	420	1000	620	3	1	4	-	-	9	-	1	1/4
108	55	21	228	1165	445	14	3	4	8	4	20	1	-	-
108	56	10	256	1140	764	1	-	8	1	1	10	-	2	1/8
108	57	23	500	1200	900	-	2	21	5	1	23	-	-	-
108	58	5	400	850	730	1	1	3	1	-	5	-	-	-
Total		231				98	46	79	45	14	206	25	20	2 1/8

MINER COUNTY
Table 3.
DATA ON FLOWING WELLS

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	Inadequate	Number used for Irrigation	Approx. Acres Irrigated	Ave. Gallon Per Min.	Number Controlled
105	56	1	-	-	115	1	-	-	1	-	1	-	-	-	-	-
105	57	13	130	400	200	8	2	2	9	-	10	3	-	-	1.85	-
105	58	17	170	430	304	13	2	-	6	2	16	1	1	1/8	8.1	1
106	57	4	90	252	200	3	1	-	2	-	4	-	1	1/2	2.0	-
106	58	11	186	710	510	4	1	6	2	-	10	1	3	3/4	3.5	4
107	55	1	-	-	306	-	-	-	1	-	-	1	-	-	1.0	-
107	57	4	710	800	749	-	1	3	2	-	3	1	-	-	.75	2
107	58	30	400	1000	600	2	4	23	3	1	26	4	2	2 1/2	5.75	11
108	57	4	800	1000	908	-	-	4	-	-	4	-	-	-	-	2
108	58	29	600	1000	844	-	2	24	6	-	26	3	1	1/4	3.38	6
Total		114				31	13	62	32	3	100	14	8	4 1/8		26

NOTE: No wells reported in the following townships and ranges in this group: T.105 R.55; T.106 R.55, 56; T.107 R.56; T.108 R.55, 56.

Miner 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.

- T.105N., R.55W.
SE 1/4 Sec. 1 12 feet:
Water stock domestic. "In 1884 which was a very dry year, nearly all shallow wells went dry. My Father noticed a green mound at the bottom of a gentle sloping hill covered with luscious green grass on which he picketed a horse to graze, by next morning the grass was eaten very short. Coming back a few days later he found that the grass had grown back considerable in spite of drought so he dug a well on this spot which has yielded plenty of water ever since. Although the water does not come up as high as it did during the wet years."
- T.150N., R.55W.
NE 1/4 Sec. 20 225 feet:
Water stock domestic. "Don't know for sure, either going dry or sandpoint filling up."
- T.105N., R.51W.
NW 1/4 Sec. 12 160 feet:
Water stock domestic. "Water doesn't taste so good, well decreases very fast after cleaning fills up with sand."
- T.105N., R.58W.
NE 1/4 Sec. 1 250 feet: (artesian)
Water stock domestic. "In digging we struck granite at 250 ft. drilled into it."
- T.105N., R.58W.
SW 1/4 Sec. 24 200 feet:
Water stock only. "The reason for trouble getting well is due to rock."
- T.106N., R.55W.
SW 1/4 Sec. 25 8 feet:
Water stock domestic. "This well is the (standby) of the community. Everyone who wants water hauls it and always plenty left. Many holes were dug before this one but no occasion to try since. One failure only a few rods from this."
- T.106N., R.57W.
NW 1/4 Sec. 10 160 feet:
Water stock domestic. "The penetration of a deep strata of Sioux Falls granite is necessary in order to procure a well in this locality - very hard to drill."
- T.107N., R.56W.
NE 1/4 Sec. 3 8 feet:
Water stock only. "Deep well has fine sand which clogs sandpoint in 4 1/2 months or less."
- T.107N., R.56W.
NE 1/4 Sec. 6 550 feet: (artesian)
(Quicksand) Water stock domestic.
- T.107N., R.57W.
NW 1/4 Sec. 15 776 feet: (artesian)
Water stock domestic. (hard stone) "This well was made in the spring of 1917 by Norbeck and Nickolson. Being the last

of the flowing well to the east of the artesian basin, it naturally was only a weak well then. I reduced the stream to $\frac{3}{8}$ and it has been so since it was made. Flowing only six gals. per minute, however, was enough to supply water for the stock and more to spare. It gradually weakened so now a man can drink as fast as it flows. If it stops in winter I don't know what to do for water as it would of course freeze solid above and below the ground. When it quits the water will stand $2\frac{1}{2}$ foot above the ground. It would be appreciated if you would give me information how to proceed to keep a pump on the well and how to arrange it to keep it from freezing."

T.107N., R.57W.
SW $\frac{1}{4}$ Sec. 29

350 feet:

Water stock domestic. "This well drilled in 1903, due to failure of driller to properly pump sand out of bottom was abandoned and casing pulled in 2 yrs. In 1929 sedimentary sand was pumped out, recased and has given satisfactory service. Except for extreme hardness of water which hardened in casing. Well located between two adjacent farms depth of well 720-740 ft."

T.108N., R.55W.
NE $\frac{1}{4}$ Sec. 21

7 feet:

Water stock only. "We tried to dig a well a year ago, we found water at 18 ft. but the vein was very slow, the water ran in to the depth of 2 ft. in 30 days."

T.108N., R.56W.
NW $\frac{1}{4}$ Sec. 4

60 feet:

Water stock only. "In boring the well herein, a very fine sand or a kind of muck was found at a depth of 60 ft. This deposit could not be raised to the surface with the apparatus for boring, so the attempt to go deeper was given up. For about three months the well furnished a supply of water for 30 head of livestock. The supply of water from this well seems to be affected very much by surface moisture."

T.108N., R.56W.
SW $\frac{1}{4}$ Sec. 4

1075 feet:

No comment on condition of water. "Water supply failed about 6 yrs. ago. The cause was due either to the condition of the casing or to some obstruction in the casing. Lack of funds prevents determining which."

T.108N., R.57W.
SE $\frac{1}{4}$ Sec. 5

883 feet:

Water stock domestic. "It should be stopped by law to put big artesian wells down for the purpose of creating artificial lakes such will destroy the artesian belt. Any well flowing more than six gallons per minute should be reduced so the artesian belt would be saved. Those big gushers flowing into artificial lakes should be stopped entirely in order to save the smaller flows for the farmers."

T.108N., R.58W.
NW $\frac{1}{4}$ Sec. 10

Depth not given:

Water stock domestic. "There have been times when the water was roily but it has been clean now for several years."

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