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Rural Water Supplies in South Dakota : Brule County

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BRULE County

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RURAL WATER SUPPLIES

IN

SOUTH DAKOTA

BRULE 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. 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.

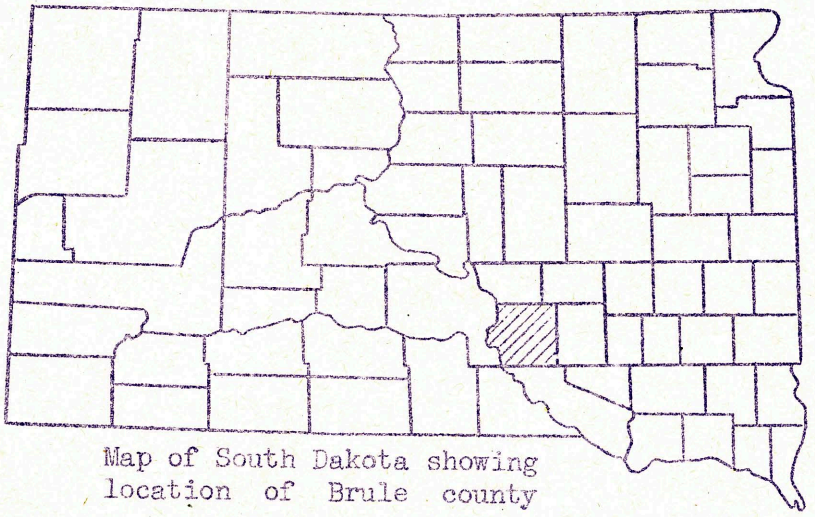
SUMMARY OF STATE SUPPLIES

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.

Brule County

Brule county lies in the southwestern part of eastern South Dakota, along the Missouri river. It is bounded on the north by Buffalo and Jerauld counties, on the east by Aurora county and on the south by Charles Mix county. It is separated from Lyman county, to the west, by the Missouri river.



Map of South Dakota showing location of Brule county

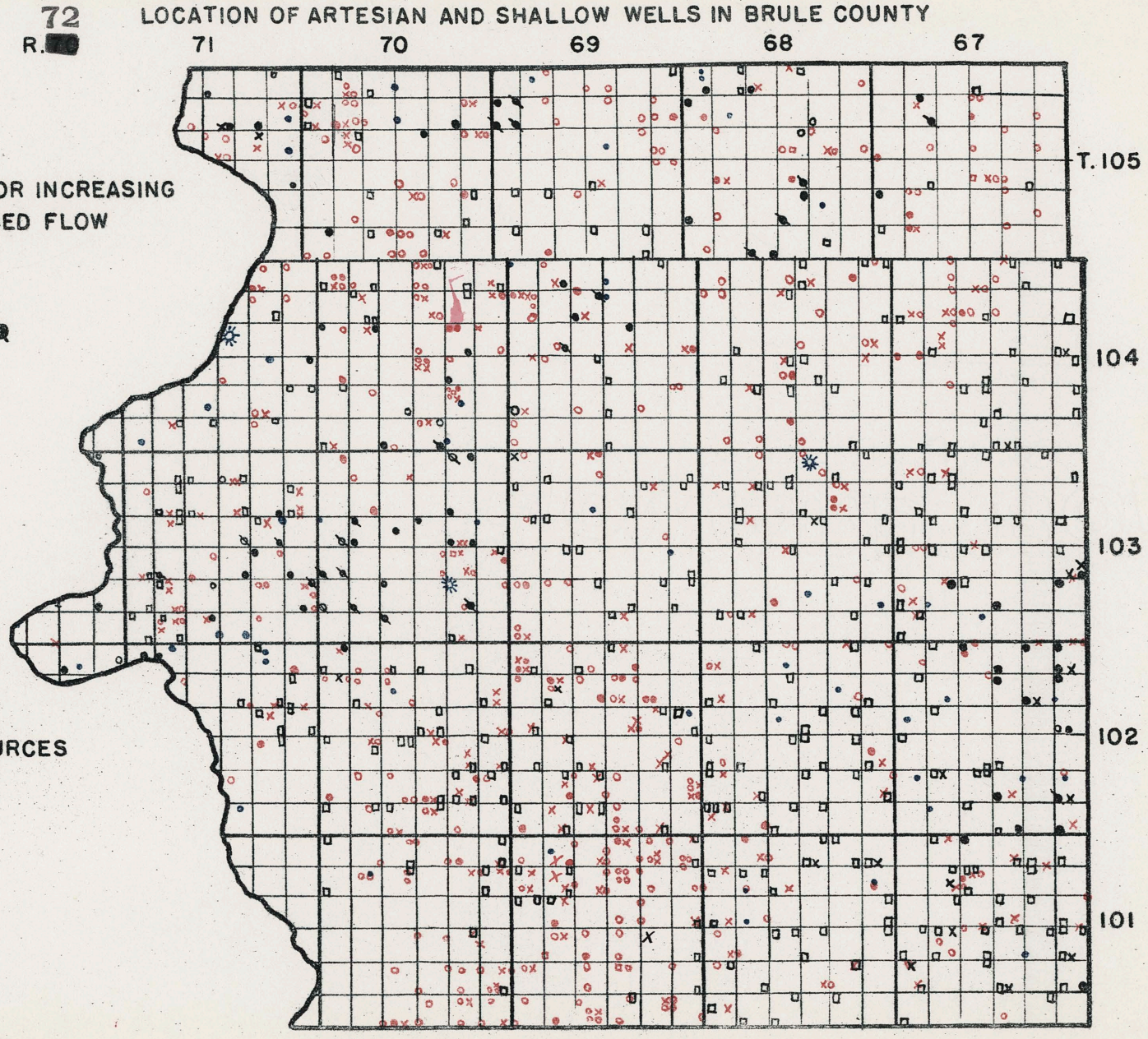
Most of the county, 90.4 per cent, is utilized for farming, the farmed area of approximately 484,306 acres being divided into 984 farms averaging about 492 acres to each farm unit. Corn, wheat, barley, and oats are the principal crops in the order of importance. More than 32,000 head of livestock were raised in the county, including cattle, horses and mules, hogs, chickens, and sheep. Dairy cattle are very important.*

In a farm area where livestock raising is important, widely distributed sources of water supply are necessary. Supplies required are not necessarily large, but adequate and constant supplies of suitable water at relatively low cost are needed in order to operate such farms profitably. The well location map of Brule county suggests that water supplies are generally available and widely distributed over the county.

On the well location map all wells obtaining water under pressure from the Dakota-Lakota sandstones are shown in black as artesian wells. Other wells

* South Dakota Agricultural Statistics, Annual Report, 1937.

LOCATION OF ARTESIAN AND SHALLOW WELLS IN BRULE COUNTY



ARTESIAN WELLS

- O FLOWING WELLS–STEADY OR INCREASING
- ● FLOWING WELLS–DECREASED FLOW
- X CEASED FLOWING
- □ PUMPED
- ⁄ CONTROLLED WELLS

SHALLOW WELLS

- O ADEQUATE SUPPLY
- ● INADEQUATE SUPPLY
- X DRY WELLS
- □ SPRINGS

- ● WELLS FROM OTHER SOURCES
- ☼ CITY WELLS

are shown in red as shallow wells regardless of depth. On all other maps, in tables, and in the text of this report, shallow wells are those 200 feet or less in depth and deep wells are those deeper than 200 feet, unless otherwise stated.

Farmers of Brule county returned 72.8 per cent of the questionnaires sent out and submitted data on a total of 820 wells, a most satisfactory basis for the conclusions presented in this report.

DEPTH AND DISTRIBUTION

Both shallow and deep wells are common in Brule county. Over the county, as a whole, there is slightly less than one well reported to each section and it may be that the average is one well or more to a square mile.

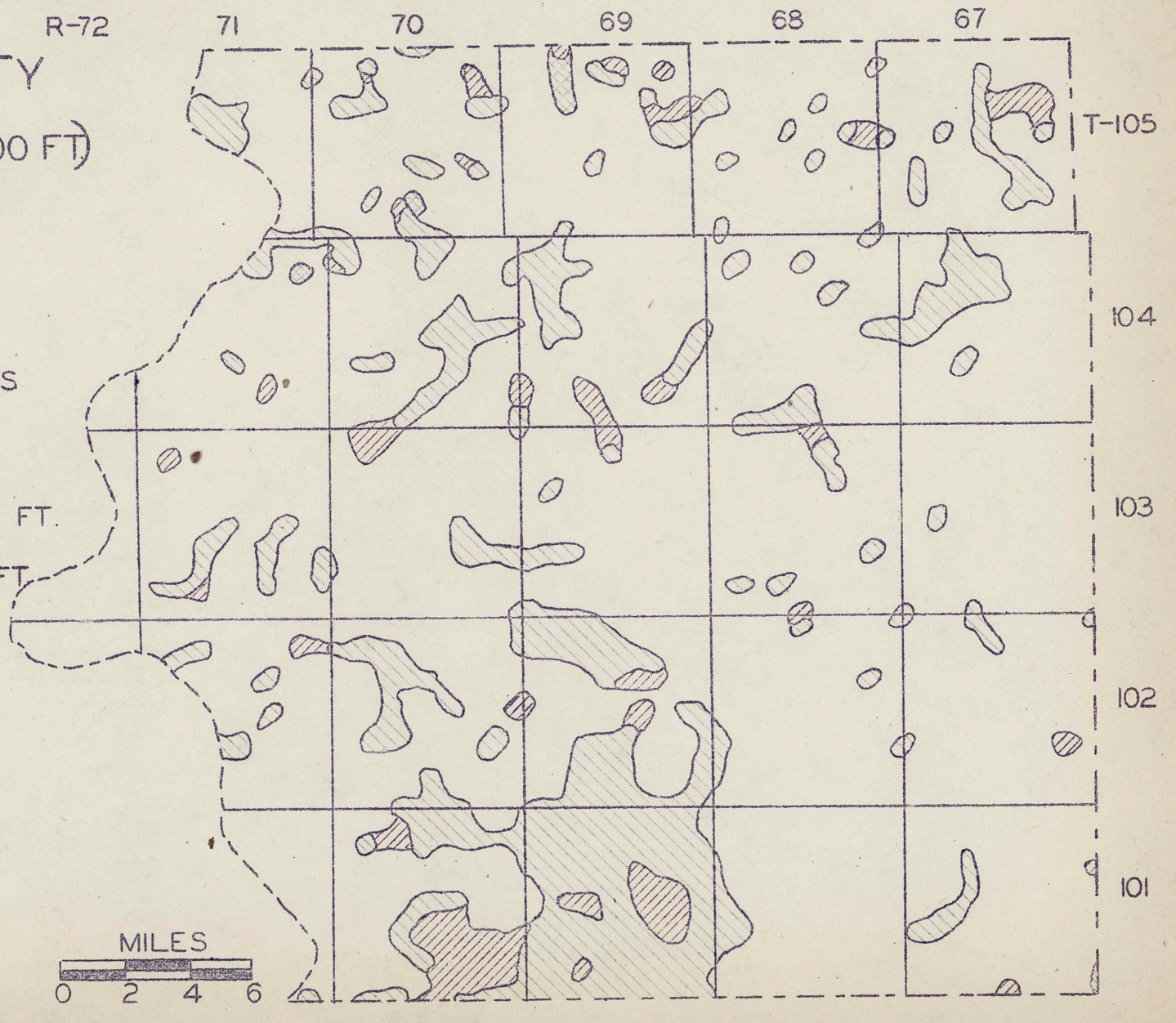
Shallow wells are fairly common. Of all the wells of the county, 46.5 per cent were reported to be shallow. In some townships, possibly because of more readily available supplies, they are numerous, one township, Twp. 102N., Rge. 71W., reporting 50 shallow wells. Eight townships reported that more than half of the wells were shallow. In Twp. 109N., Rge. 69W., and Twp. 101N., Rge. 70W., 80.6 per cent and 75.6 per cent, respectively, were reported.

Most of the shallow wells for which depths were reported were not more than 50 feet deep, since somewhat more than 80 per cent of them were so reported.

More than half of the wells of Brule county are deep wells, both pumped and flowing wells. Of all wells reported, 53.5 per cent were more than 200 feet deep. In 15 townships, however, the average for the county is exceeded, and in 17 townships more than 50 per cent of all wells reported were deep. In order that comparison of the relative importance of deep wells in each township may be made, those with more than 50 per cent of these are tabulated in the following table.:

BRULE COUNTY

SHALLOW WELLS (0-200 FT.)



DEPTH AT WHICH SUPPLIES ARE COMMONLY OBTAINED

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

MILES
0 2 4 6

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Twp.	Rge.	Per cent of All Wells	Twp.	Rge.	Per cent of All Wells	Twp.	Rge.	Per cent of All Wells
101N	67W	80	102N	72W	100.	103N	72W	100.
101	68	82.3	103	67	82.9	104	67	52.8
102	67	80.6	103	68	67.6	104	68	60.
102	68	78.4	103	69	65.5	105	68	61.5
102	70	52.	103	70	71.4	105	71	54.5
102	71	70.6	103	71	69.8			

Most of the deep wells obtain water at considerable depths, mostly 700 feet to 1000 feet deep. Indeed, 73 per cent of all wells reported from Brule county were within these limits. Only 34 wells of the 444 reported were between 200 feet and 800 feet and 10 of these were between 700 and 800 feet. The wells reach a maximum depth of 1800 feet.

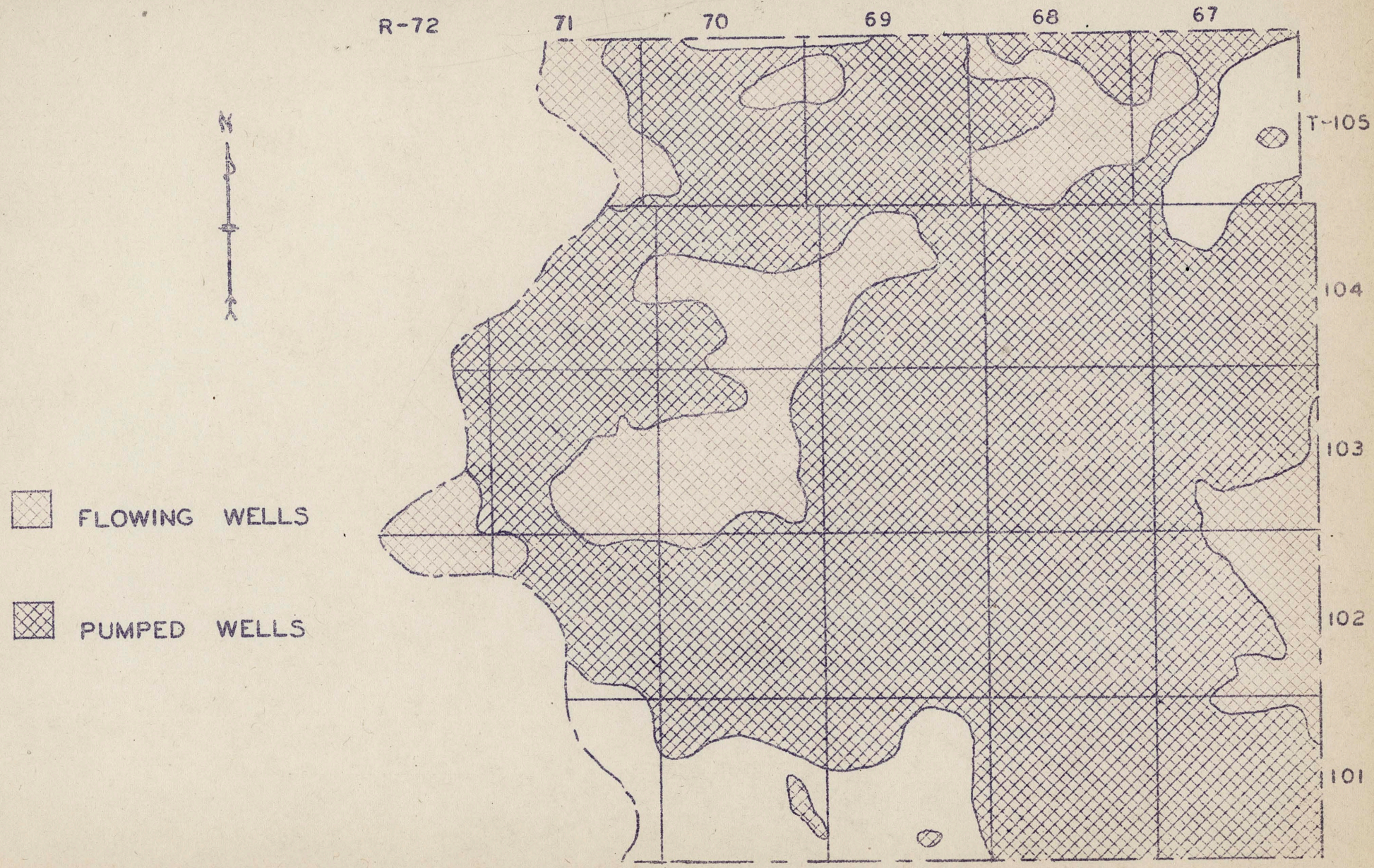
In Brule county approximately one fifth (21.4 per cent) of the deep wells are flowing wells. The distribution of these wells is indicated on the well location map, where they are shown as flowing artesian wells, and the areas are shown on the artesian well map of Brule county.The relation of these areas to those of the state is shown on the artesian map of South Dakota.

CHARACTER OF WELL WATERS

The character of the well waters of Brule county has been determined from the replies by users to questionnaires. Each farmer was asked whether he considered the water from his well to be hard, moderately hard, or soft, and whether or not the water was suitable for drinking.Although chemical analyses, the most satisfactory basis for judgment of character, are rarely available to farmers, usage is probably a fairly good criterion of general character. Detailed information on quality must await laboratory analyses.

Well waters of Brule county are predominantly hard, whatever the depth or source. Shallow wells, 200 feet or less in depth, are persistent producers of hard water. Farmers reported 54.7 per cent hard,39.8 per cent moderately hard, and only 5.5 per cent soft. Thus, 94.5 per cent of the shallow wells are reported moderately to definitely hard.A small area including parts of Twp.104N.

ARTESIAN AREAS 1938



BRULE COUNTY

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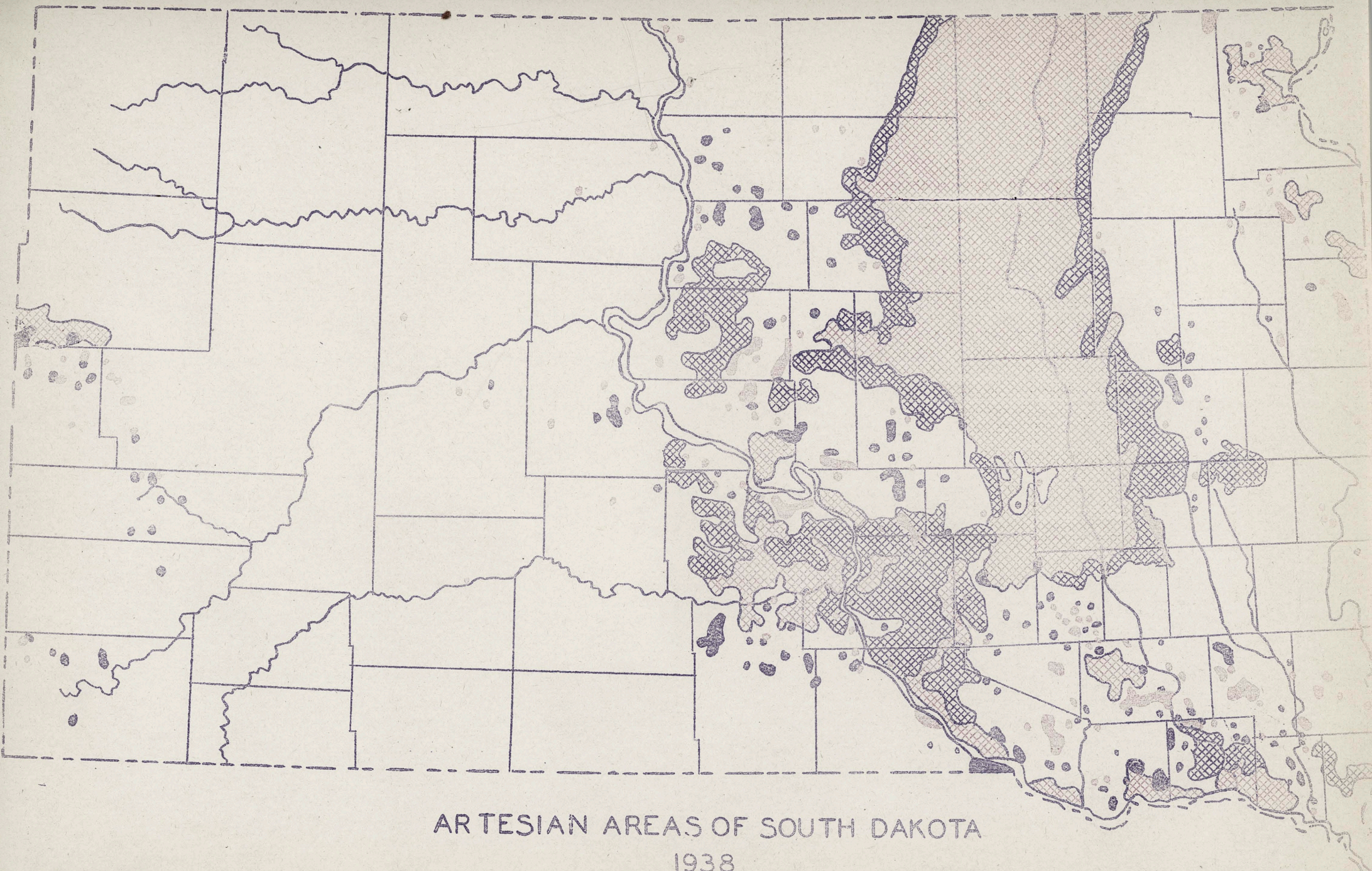

ARTESIAN AREAS OF SOUTH DAKOTA

1938

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W.P. 3636

FLOWING WELLS

PUMPED ARTESIAN WELL

Rge. 68W., Twp. 104N., Rge. 69W., Twp. 105N., Rge. 68W., and Twp. 105N., Rge. 69W., tends to produce considerably fewer hard water wells, and many more moderately hard and soft water wells. The wells from these townships have been tabulated as follows:

Twp.	Rge.	Hard	Moderately Hard	Soft
104N	68W	33.3	66.7	-
104	69	20.	73.4	6.6
105	68	30.	60.	10.
105	69	36.8	52.6	10.6

Most shallow water of the county is satisfactory for drinking, although 12.5 per cent are reported unsatisfactory. In several townships, however, a large part is unsuitable for drinking; from 20 per cent to 83 per cent are not potable.

These areas in which there is pronounced tendency for shallow wells to supply water unsatisfactory for drinking are tabulated below:

Twp.	Rge.	Per cent Unsatisfactory for Drinking	Twp.	Rge.	Per Cent Unsatisfactory for Drinking
101N	67W	22	102N	68W	25
101	68	83	102	69	20
101	70	19	103	68	40

Deep pumped wells uniformly produce hard water in Brule county. Users reported nearly all to be moderately hard to definitely hard, with considerably more than four fifths, 87.5 per cent, definitely hard. Indeed, moderately hard and definitely hard waters were reported from 99.1 per cent of all deep pumped wells and less than one per cent were reported soft.

Likewise deep flowing wells produce hard water,as may be suspected, since they penetrate the same artesian sands as the deep pumped wells. Reports indicate that 92.2 per cent were hard, 3.1 per cent moderately hard, and 4.7 per cent soft.

A considerable number of the deep pumped wells produce water unsatisfactory for drinking. A total of 68, or 19.5 per cent, were reported unsatisfactory by farmers. A somewhat greater per cent, 21 per cent, of the flowing wells were reported unsuitable for drinking.

Reasons for unsatisfactory character are not apparent. Surface contamination is possible in some cases. The presence of objectionable chemical compounds not determinable without analyses is most likely in many cases.

ADEQUACY OF SUPPLY

In order to ascertain whether farm water supplies were adequate for current needs, farmers were asked in questionnaires whether the wells had failed at any time to provide sufficient supplies. Although wells, for the most part, are reported to be adequate, considerable distress is reported by users of shallow and deep pumped wells, especially in parts of the county. More than one fifth, 21.5 per cent and 21.8 per cent of the shallow wells and deep pumped wells were reported inadequate for current farm needs. However, in some localities, difficulties in obtaining shallow waters are so serious that one fourth to one half of all shallow wells reported were inadequate. The townships in which 25 per cent or more of the shallow wells were reported inadequate are listed below:

Twp.	Rge.	Per cent Inadequate	Twp.	Rge.	Per cent Inadequate
101N	67W.	33.3	103N	68W	30.
101	68	33.3	103	70	25.
102	67	50.	104	70	29.7
102	69	43.3	105	68	30.

In many places in the county, deep pumped wells are inadequate in very considerable proportions. These townships and the percentages of inadequate wells are tabulated as follows:

Twp.	Rge.	Per cent Inadequate	Twp.	Rge.	Per cent Inadequate
101N	68W	28.6	103N	70W	33.3
101	69	25.	104	71	33.3
101	70	50.	105	67	50.
102	69	25.	105	70	25.
102	70	28.	105	71	50.

Flowing wells have a much more satisfactory record, with only 14.7per cent reported inadequate. Inadequacy of flowing wells is due in part to casing of too small a diameter, low artesian pressure due to elevation of the surface,

and to lack of needed repairs on the well and possibly other factors.

IRRIGATION

Wells of Brule county are used in many cases to irrigate small plots of land. Thirty four shallow wells were used to irrigate 7 1/8 acres in plots varying in size from 1/8 acre to one acre. A total of 40 deep pumped wells were reported to be in use to irrigate 12 3/4 acres in plots of similar size, and 41 flowing wells were in use to irrigate approximately 94 acres.

SUPPLEMENTARY SUPPLIES

Springs and cisterns are in use to supplement water supplies obtained from wells. Springs are not very important, since only five were reported. All of these were reported adequate for use for stock and domestic purposes. One spring, considered unsatisfactory for drinking, was used to irrigate 1/8 acre.

In an area where well waters are hard and where many are inadequate, cisterns are extremely important supplementary supplies. In Brule county, very nearly 5/8 as many cisterns as wells were reported. They were used for laundry purposes (90.2 per cent) and for drinking, (64.6 per cent).

BRULE 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
101	67	9	10	75	28	3	4	-	-	2	6	3	-	-
101	68	6	24	26	25	2	3	-	1	5	4	2	4	2 5/8
101	69	50	5	85	32	26	20	4	7	2	41	9	9	1
101	70	31	8	90	44	22	8	-	5	6	27	4	2	1/4
102	67	6	14	200	61	3	1	1	-	-	3	3	-	-
102	68	8	24	80	28	3	4	-	-	2	7	1	-	-
102	69	30	14	65	34	14	11	1	3	6	17	13	3	1/2
102	70	24	11	200	31	17	6	-	1	3	20	4	-	-
102	71	5	17	56	31	2	3	-	-	-	2	3	-	-
103	67	6	32	40	36	3	-	-	-	-	6	-	-	-
103	68	10	20	60	41	8	2	-	2	4	7	3	-	-
103	69	10	10	60	28	6	5	-	1	-	8	2	-	-
103	70	8	16	90	42	3	2	1	-	-	6	2	1	-
103	71	13	16	100	36	5	4	1	2	1	12	1	-	-
104	67	17	16	45	28	9	6	2	-	1	14	3	-	-
104	68	12	12	40	25	4	8	-	-	-	10	2	-	-
104	69	16	16	90	39	3	11	1	-	1	13	3	2	1/4
104	70	27	8	90	31	20	3	1	1	5	19	8	1	-
104	71	8	18	126	58	4	2	2	1	1	7	1	-	-
105	67	18	10	70	28	8	7	1	1	-	14	4	1	1/8
105	68	10	6	80	27	3	6	1	1	-	7	3	2	1/8
105	69	19	10	160	60	7	10	2	3	2	17	2	6	2 1/4
105	70	28	8	135	38	13	12	-	1	5	23	5	3	-
105	71	5	22	40	32	3	1	1	-	1	5	-	-	-
Total		376				191	139	19	30	47	295	81	34	7 1/8

NOTE: No wells reported for the following townships and ranges in this group: T.101 R.71;T.102 R.72;and T.103 R.72

BRULE 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
101	67	34	700	980	781	28	2	-	9	11	25	9	4	1 3/8
101	68	28	285	980	812	23	5	-	13	1	20	8	-	-
101	69	12	845	1080	945	11	1	-	4	7	9	3	1	-
101	70	10	830	1080	976	8	2	-	2	2	5	5	-	-
102	67	11	700	908	846	9	1	1	6	1	9	2	-	-
102	68	29	300	1100	854	18	9	1	13	1	24	5	5	3 1/4
102	69	20	890	1000	925	17	1	-	7	3	15	5	3	3/4
102	70	25	750	1200	979	21	2	-	9	4	18	7	5	1 1/8
102	71	10	963	1800	1128	10	-	-	4	2	10	-	3	1 1/8
103	67	25	800	1100	961	19	-	1	9	3	19	6	2	-
103	68	21	800	1200	913	17	2	-	7	3	16	5	4	2 1/8
103	69	19	700	1000	856	16	1	-	5	1	16	3	1	1/2
103	70	3	225	930	687	2	1	-	-	1	2	1	1	1/8
103	71	18	800	1110	953	16	2	-	10	8	15	3	1	1/4
104	67	19	900	1300	968	16	2	-	4	4	16	3	1	1
104	68	18	282	1000	851	16	1	-	7	3	17	1	1	-
104	69	4	800	1000	925	4	-	-	-	1	4	-	-	-
104	70	11	900	1100	1002	9	1	-	2	1	10	1	1	-
104	71	6	850	1150	1019	5	1	-	4	2	4	2	1	-
105	67	4	900	1200	1029	3	1	-	1	1	2	2	1	1/8
105	68	5	240	943	784	5	-	-	-	3	4	1	3	3/4
105	69	7	840	1200	1018	6	1	-	2	1	6	1	-	-
105	70	8	900	1324	1132	6	2	-	2	2	6	2	1	-
105	71	2	875	1297	1136	2	-	-	1	2	1	1	1	1/4
		349				287	38	3	121	68	273	76	40	12 3/4

NOTE: No wells reported for the following townships and ranges in this group: T.101 R.71;T.102 R.72; and T.103 R.72

BRULE 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
101	67	2	-	-	-	1	-	-	1	-	2	-	-	-	20	-
102	67	14	800	900	847	13	-	1	8	3	10	4	5	2 3/8	10.9	1
102	70	1	-	-	-	-	-	-	-	-	-	1	-	-	1.	-
102	71	2	660	1020	840	2	-	-	-	1	2	-	1	60	20.	-
102	72	2	575	650	612	1	-	-	-	-	2	-	1	-	30.	-
103	67	4	850	1000	895	4	-	-	1	-	2	2	1	3/4	4.8	-
103	70	17	800	1000	862	13	1	-	4	3	16	1	9	13 3/8	116.5	9
103	71	12	327	1000	856	11	-	1	5	4	10	2	6	2 3/8	5.	4
103	72	2	670	670	670	2	-	-	1	1	2	-	-	-	4.	-
104	69	6	840	900	880	6	-	-	3	1	5	1	3	1 1/2	10.	2
104	70	8	830	1090	913	8	-	-	6	2	7	1	4	5 1/4	102.	1
104	71	1	800	800	800	1	-	-	-	1	1	-	-	-	-	-
105	67	3	900	960	936	3	-	-	-	-	3	-	2	1/8	6.	1
105	68	11	825	1500	967	10	-	-	5	2	10	1	7	8	11.3	3
105	69	3	845	850	848	3	-	-	1	-	3	-	2	1/4	2.5	3
105	70	3	864	1000	948	2	1	-	-	-	3	-	-	-	3.7	-
105	71	4	885	1000	938	3	-	1	3	2	3	1	-	-	22.9	-
Total		95				83	2	3	38	20	81	14	41	94		24

NOTE: No wells reported for the following townships and ranges in this group: T.101 R.68, 69, 70, 71; T.102 R.68, 69; T.103 R.68, 69; T.104 R.67, 68.

Brule 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. 101N., Rge. 67W.
SE 1/4 Sec. 3

830 feet:
"There is no surface water to speak of in this part of the county."

Twp. 101N., Rge. 68W
NW 1/4 Sec. 19

24 feet:
"The well described on the reverse side of this sheet is really located right on the section line. The water is pumped by windmill. Have been unable to get water on our farm after many testings. (We have a tubular well which has been cased over and unused for many years.) The reason my husband stopped using it is that (it rusted the casing and pipes out too fast. This well had soft water but was salty.)"

Twp. 101N., Rge. 69W.
SE 1/4 Sec. 12

22 feet:
"The water smelled bad all this summer, it isn't fit for drinking unless I boil it and the cistern is dry. The well water is used for everything - hogs, cattle and home."

Twp. 101N., Rge. 69W.
NE 1/4 Sec. 32

65 feet:
"The well described on other side is used only when working the land through the summer and after harvesting the crops from October to 15th of January. I water 20 head of stock. My well will corrode the pump pipes in 4 years time."

Twp. 101N., Rge. 69W.
NE 1/4 Sec. 35

43 feet:
"I also have another well on same farm which I use for hogs and small calves.17 ft. deep 24 in. diameter, water medium, age of well 27 years. Curbing rotten needs recasing."

Twp. 101N., Rge. 70W.
SE 1/4 Sec. 33

Depth not given:
"The well on this farm was here when we moved here three years ago. I don't know how many years ago it was dug. We have plenty of water for our stock but it is not good for drinking. We have to haul our drinking water from our neighbors place."

Twp. 102N., Rge. 68W.
NE 1/4 Sec. 2

918 feet: (artesian)
"It is hard to find shallow wells that are of any importance in this territory. They do not hold water for any length of time."

Twp. 102N., Rge. 68W.
SE 1/4 Sec. 29

910 feet: (artesian)
"Our artesian well basin is lowering every year which I think could be remedied if there was some way to stop all the wild wells, which do not much good to

anyone. When our artesian wells are gone then this country is gone also. This has happened in some parts of the state so far. There are parts of Hyde county where it is impossible to get an artesian well today, while in other years past such a thing was possible - this I again say is the fault of the wild wells."

Twp. 102N., Rge. 69W.
NE 1/4 Sec. 14

960 feet: (artesian)
"The reason for the artesian well on the farm is we could not get a shallow well to furnish enough water."

Twp. 102N., Rge. 70W.
SE 1/4 Sec. 26

1003 feet:
"I can't get water when trying for a shallow well."

Twp. 102N., Rge. 70W.
SW 1/4 Sec. 33

39 feet:
"Have not been able to find sufficient water in shallow wells near the buildings without going to soapstone which would have to go down 80 to 90 ft."

Twp. 103N., Rge. 67W.
SE 1/4 Sec. 6

Depth not given:
"There is one dug well which has plenty of water but the water was so bitter not even cattle would drink it. Had a good wood curbing but is almost crumbled shut. The other dug well further to the west is fine but use it for one cow. This well runs dry when it does not rain. Last summer it was alright."

Twp. 103N., Rge. 68W.
NW 1/4 Sec. 17

960 feet: (artesian)
"Before we dug the artesian well we had trouble with digging shallow wells, they would last a little while then go dry."

Twp. 103N., Rge. 69W.
SW 1/4 Sec. 31

10 feet:
"There are three wells on this farm and one we use. The one north of the buildings has the best water but it needs cleaning and new curbing and the owner does not care to go through the expense of doing this. The third well had plenty of water but it was out of the way; pigs fell in it so now it is filled up. The other two wells give lots of water, the well we use has very hard water but good cooking and drinking water, and the north well has medium hard water also very good to drink. The cistern we miss very much and most of the time we use lye water for the laundry but Minnie Karson won't get it fixed up. There is plenty of water on this farm, you can dig 8 to 10 ft. and get water most anywhere in the yards."

Twp. 103N., Rge. 70W.
NW 1/4 Sec. 2

850 feet: (artesian)
"I do not know how many places, or where they have tested for shallow wells on this farm, as this is my first year here. I have been told by several that water can not be found here by the shallow method. The artesian well was flowing 30 to 40 gals. per minute till about April 1st when it suddenly stopped to about 1/2 gal. a minute and has been that way ever since."

Twp. 103N., Rge. 71W. SE 1/4 Sec. 25	900 feet: "The water has cut through the casing on artesian well and the only water I get is what comes around casing, it has a short case slipped over the top but considerable water is lost on the ground and the well is badly corroded and needs cleaning."
Twp. 104N., Rge. 68W. NW 1/4 Sec. 1	970 feet: (artesian) "The well on opposite page has been rebored once, three years ago it was corroded so the water didn't rise up to the present level, when this well was put down the water came within 12 ft. of top but has gradually sunk to its present level. I have a 24 ft. dug well also on this farm but the water is very hard and seems to be getting harder right along, we use it for house use but is too hard to use for washing."
Twp. 105N., Rge. 67W. SW 1/4 Sec. 23	10 feet: "This well has good water but it needs new curbing and should be dug five feet deeper and I don't believe it could be pumped dry."
Twp. 105N., Rge. 69W. NE 1/4 Sec. 28	28 feet: "This well supplies water for 500 head of cattle. It is clear as a crystal good water. All the neighbors haul water from this well for house use. It's the best well in Brule county."
Twp. 105N., Rge. 70W. NW 1/4 Sec. 7	1272 feet: (artesian) "The only way to get a sufficient water on this farm for stock is artesian wells. We have drilled several wells as deep as 90 ft. but could get no water. We dug a surface well and built a small dam and that supplied water for a small amount of stock."
Twp. 105N., Rge. 70W. NE 1/4 Sec. 17	No depth given: "In regard to the water supply on this farm it is impossible to find a shallow vein - I have tried it more than a dozen times."
Twp. 105N., Rge. 71W. NE 1/4 Sec. 14	875 feet: (artesian) "Had a good flow in my well until about three years ago. It quit flowing all at once and it is caved in or plugged up about 350 ft. down, does not furnish any water but would be lots of water if cleaned out and recased."

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