Rural Water Supplies in South Dakota: Marshall County

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Rural Water Supplies in South Dakota

Marshall County

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Number 47

Extension Service
South Dakota State College
Brookings, S. D.
RURAL WATER SUPPLIES
IN
SOUTH DAKOTA
MARSHALL 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 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
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. Neleen 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.
Marshall county is located in the northeastern part of South Dakota along the northern boundary of the state. It is bounded on the north by North Dakota, on the east by Roberts county, on the south by Day county and on the west by Brown county.

The chief industry of Marshall county is agriculture. Approximately 85.7 per cent or 487,592 of the 568,960 acres are in farms divided into farm units. Of the acres farmed in 1939, approximately 70 per cent of the farm acres were reported to be in crops. The major crops in the order of their importance are wheat, corn, oats and barley. Sheep, cattle and hogs being the most important.

In order that farms of this type may be operated successfully it is necessary that suitable and adequate supplies of underground water be available and that it be obtained at relatively low cost. For the most part, adequate water supplies are available and in use in most parts of the county. (See well location map, page 5.) The shallow well map on page 7 indicates that shallow water is being obtained in the eastern two-thirds of the county, mostly within fifty feet of the surface. In the western part of the county where shallow wells were not reported, deep wells are important. In some portions of the

county both shallow and deep wells were reported. In many places difficulties in obtaining water were encountered and some of these are quoted from questionnaires at the end of this report.

In this report, wells are divided into two groups, deep and shallow. All flowing wells and all deep pumped wells which obtain water from the Dakota-Lakota sandstones are shown in black on the well location map and are classified as artesian wells. All others are called shallow wells, regardless of depth and are shown in red on this map. In all other maps and tables and elsewhere in the text of the report, the term shallow wells applies to wells 200 feet or less in depth unless otherwise stated. Wells 200 feet or more in depth are classed as deep wells and include all artesian wells except flowing wells 200 feet or less in depth. These uses of terms should be kept in mind in studying this report.

To obtain information, questionnaires were sent to 1347 farmers of the county, 733 of whom responded giving information on 794 wells and 74 springs throughout the county. As indicated by questionnaires, the majority of the wells (520 or 65.5 per cent) were shallow wells.

DEPTH AND DISTRIBUTION OF WELLS

Shallow wells (200 feet and less in depth): Shallow wells were reported from all of the townships in the county. The greater numbers occur in the central and eastern parts of the county. In the western part shallow wells are scattered and deep wells are the main source of supply. The depths from which water is obtained from the shallow wells is indicated on the shallow water map to show as accurately as possible the depths of shallow supplies in use as reported by the questionnaires. These wells were separated into fifty foot depth intervals for mapping. Approximately 66 per cent were from 0 to 50 feet in depth and 21 per cent 50 to 100 feet in depth. Thus, approximately 87 per cent of the shallow wells were reported less than 100 feet in depth. The wells less
than 100 feet in depth are approximately 57 per cent of all of the wells reported for the county. Only 13 per cent of the wells reported at depths of 100 to 200 feet are 8 per cent from 100 to 150 feet and 5 per cent from 150 to 200 feet deep. The number of shallow wells thus decreases rapidly with depth probably because of increasing cost with increasing depth.

In the western part of the county where artesian wells are in use, (see the artesian area map, page 10), few shallow wells were listed and these were nearly all less than 50 feet in depth. In the artesian area in the northeastern corner of the county, most of the shallow wells are 100 to 200 feet in depth. Thus, it appears that where artesian water is available adequate supplies are more certain and satisfactory than those from shallow wells although frequent attempts have been made to obtain shallow wells in this area.

In the east central area, in the following nine townships, all wells reported were shallow:

<table>
<thead>
<tr>
<th>Township</th>
<th>Range</th>
<th>Township</th>
<th>Range</th>
<th>Township</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>125N</td>
<td>53W</td>
<td>126N</td>
<td>55W</td>
<td>127N</td>
<td>53W</td>
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<tr>
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<tr>
<td>127</td>
<td>55</td>
<td>128</td>
<td>54</td>
<td>129</td>
<td>54</td>
</tr>
</tbody>
</table>

The relative abundance of shallow water in this part of the county is indicated by the fact that only one well in this area was reported to be over 100 feet in depth and 77.2 per cent were less than 50 feet in depth. In only two townships, T.125N., R.57W. and T.128N., R.57W., were 50 per cent or more of the shallow wells reported over 100 feet in depth. Further, except in the artesian area, shallow water is the main source of supply and the majority of shallow wells in this area are being obtained at less than 100 feet in depth. In most of the townships, wells are predominantly less than 50 feet in depth and are evenly distributed within the townships. (See shallow well map.)

The relationship between the shallow wells and the deep wells by townships may be seen in the following table:
Deep wells (over 200 feet in depth): Deep wells, both pumped and flowing, occur in 21 of the 30 townships of the county. Deep wells total 274 or 34.5 per cent of the 794 wells reported for the county and range in depth from 201 feet to 2000 feet. (See pages 18 & 19) Five townships have one or more wells deeper than 1000 feet but in eight townships the maximum depth of pumped wells is only 365 feet. Flowing wells range in depth between 700 and 2000 feet.

In 10 townships 19 wells were reported to be 200 to 300 feet in depth. Most of these wells (14) were reported in township 125N. The others are distributed in the east and central part of the county as follows:

Wells reported to be 300 to 700 feet in depth are distributed as follows with the exception of those wells in T.129N., R.53W. Three townships reported wells 300 to 400 feet in depth; T.125N., R.54W., 1 well, T.125N., R.57W., 3 wells, and T.127N., R.56W., 1 well. Three wells ranging in depth from 400 to 700 feet were reported, one pumped well in T.125N., R.57W., and 2 flowing in T.125N., R.53W. In the northeastern corner of the county in T.128N., R.53W., and T.129N., R.53W., eleven flowing wells were reported from 450 to 800 feet.
in depth, 800 feet being the maximum depth for this part of the county.

Thus, of the 27 wells reported between 200 to 700 feet in depth, 66 per cent are 200 to 300 feet in depth (with the exception of T.125N., R.57W.) The wells reported to be 300 to 800 feet in depth are a small percent of the wells in each township; being only 9.5 per cent of the deep wells in the county.

The remaining 90.5 per cent of the deep wells range from 800 to 2000 feet in depth and are found in the western part of the county and are artesian wells with a source of supply in the Dakota-Lakota sandstone group as in the northeastern area. These comprise a total of 247 wells, or 31.2 per cent of the total 794 wells reported in the county. The location and minimum and maximum depths of these wells are as follows:

<table>
<thead>
<tr>
<th>Twp.</th>
<th>Rge.</th>
<th>Number</th>
<th>Depth</th>
<th>Twp.</th>
<th>Rge.</th>
<th>Number</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
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<td>850</td>
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<td>58</td>
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<td>960</td>
<td>128</td>
<td>53</td>
<td>6</td>
<td>700</td>
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<tr>
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<td>59</td>
<td>26</td>
<td>800</td>
<td>128</td>
<td>56</td>
<td>4</td>
<td>800</td>
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<td>27</td>
<td>800</td>
<td>128</td>
<td>58</td>
<td>28</td>
<td>800</td>
</tr>
<tr>
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<td>57</td>
<td>23</td>
<td>850</td>
<td>128</td>
<td>59</td>
<td>15</td>
<td>800</td>
</tr>
<tr>
<td>127</td>
<td>58</td>
<td>17</td>
<td>800</td>
<td>128</td>
<td>58</td>
<td>35</td>
<td>700</td>
</tr>
</tbody>
</table>

This table shows the minimum, maximum depth by townships of which the important deep supplies are reported as being obtained. Of the above wells, 215 or 78.8 per cent are flowing. The Artesian area Map, (page 10), outlines in red the area in which flowing wells were reported. The remaining pumped wells over 900 feet in depth are indicated on this map by the blue area. The relation between the artesian areas of Marshall county is shown on the map of the artesian areas of the state. (Page 13)

CHARACTER OF WELL WATERS

On the questionnaires, farmers were asked to indicate whether they considered the water from their wells to be hard, medium or soft. Although it is recognized that chemical analysis of the water supplies are not commonly avail-
able to farmers as a basis for reply to this inquiry, it is believed that through usage, especially domestic use, the relative hardness is determined in a general way.

Of the shallow wells reported in the county 64.5 per cent produce hard water, 31 per cent moderately hard and only 4.5 per cent soft water. The hard and relatively hard waters comprise approximately 95 per cent of all shallow water. Hard and moderately hard water wells are distributed over the county and at the various depths to which shallow wells penetrate. The hard water wells predominate in most townships. The moderately hard water wells are somewhat less in number.

A few soft shallow wells are listed in the southern and central east part of the county in the following townships:

<table>
<thead>
<tr>
<th>Twp.</th>
<th>Rge.</th>
<th>Number of Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>125N</td>
<td>53W</td>
<td>3</td>
</tr>
<tr>
<td>125</td>
<td>54</td>
<td>2</td>
</tr>
<tr>
<td>125</td>
<td>57</td>
<td>4</td>
</tr>
<tr>
<td>125</td>
<td>58</td>
<td>3</td>
</tr>
<tr>
<td>126N</td>
<td>54W</td>
<td>1</td>
</tr>
<tr>
<td>127</td>
<td>53</td>
<td>2</td>
</tr>
<tr>
<td>127</td>
<td>54</td>
<td>2</td>
</tr>
<tr>
<td>128</td>
<td>54</td>
<td>3</td>
</tr>
</tbody>
</table>

These wells are all reported within 50 feet of the surface except in T.125N., R.57W., and T.125N., R.58W. In these two townships the soft water wells are reported over fifty feet in depth and most of them are more than 100 feet deep. Three wells are reported to be 150 to 200 feet in depth.

Thus, in most shallow wells of the future, the water may be expected to be hard or moderately hard with the possibility of soft water in the areas mentioned.

Of the 27 deep wells between 200 and 700 feet in depth all but three were reported to produce hard or moderately hard water except three which were listed as soft in T.125N., R.57W., and T.125N., R.58W. These were between 200 and 300 feet in depth.

The 247 deep wells over 700 feet in depth, both flowing and pumped, reported 83.4 per cent soft, 15 per cent medium and 1.6 per cent hard. Most of the moderately hard water was reported in the northwest corner of the county.
The well 2000 feet deep was reported to produce soft water. It is evident that deep wells are a relatively certain source of soft water in Marshall county.

Of all the wells reported (794 - both shallow and deep) 77 were reported to be unsuitable for drinking purposes. Of these, 60 were shallow wells, 5 deep pumped and 12 were flowing wells.

Most of the unsuitable water from shallow depths is obtained within 100 feet of the surface. Indeed, most of it is obtained at less than fifty feet in depth. These wells are scattered over the county and are roughly in proportion to the number of shallow wells reported from 0 to 100 feet in depth.

The unsuitable deep wells are also scattered and so few in proportion to the number of wells reported as to be of little importance. It is suspected that there may be many reasons for unsuitability, possibly including contamination, and unpleasant dissolved salts inherent in the water. There is also the possibility that injurious chemical ingredients, which may be determined only by laboratory analysis, are present in these waters.

Adequacy of Well Waters

In the questionnaires, the farmers were asked whether the well had ever failed to supply sufficient water. Of the 794 wells reported, 169 replies stated an insufficient supply at the time. Of shallow wells listed, 111 wells or 21.3 per cent were reported inadequate. Of the deep pumped (26 wells or 5 per cent) and the flowing wells (32 wells, or 6.1 per cent) were reported to furnish insufficient supplies. The greatest adequacy in shallow wells occurs in the very shallow wells less than 50 feet in depth, 79 wells or 23.6 per cent of these being reported as inadequate and scattered over the county. The other 32 inadequate shallow wells were at random depths from 50 to 200 feet. The greatest inadequacy was reported among the deep pumped wells, of which 26 of 59 wells or 44.5 per cent were listed as insufficient for the present needs. Most of these inadequate pumped wells are in range 57, townships 125, 126, and
127N., where \( \frac{1}{4} \) of the 26 inadequate wells were reported.

Among the flowing wells, 32 of the 215 wells, or \( \frac{14.9}{\%} \) per cent were listed as inadequate. Of these, 20 were reported in four townships. (See table 3, page 19).

Some wells were reported to be used to some degree for irrigation. Of the shallow wells, 19 were used to irrigate a total of \( 3 \frac{7}{8} \) acres which consisted of small garden plots. Only two pumped wells were listed for such use, irrigating \( 3/4 \) of an acre. Four flowing wells were used to irrigate approximately two and \( 3/8 \) acres, consisting of small garden plots such as those found on the average farm.

The approximate average flow of the flowing wells by township ranges from \( 1/2 \) gallon to \( 6 \) \( 1/2 \) gallons per minute or a flow per well of \( 1/2 \) to 30 gallons per minute. Of 98 flowing wells reported as equipped with control valves, 91 were reported to be in use.

Reports indicate that the flow of flowing artesian wells is decreasing since 133 wells were listed with decreased flow, whereas only eight were listed with increased flow. Forty-three wells were reported with undiminished and constant flow. These are distributed over the areas of flowing wells and at various depths. Ignoring the unstated flow from some wells, 72.1 per cent of the flowing wells were reported to be decreasing in flow.

Adequacy, as treated here, is based on the present supply and the present needs and the present uses by the farmers and does not indicate adequacy in the future as any of these factors change.

**ADDITIONAL WATER SUPPLIES**

The use of springs for water supply appears to be somewhat restricted in Marshall county. Most of the springs, 79 in all, were reported in the central and eastern parts of the county where they are used mostly for watering of livestock. Here they are an important supplementary source of supply.
nine are used for stock only and 36 for stock and domestic purposes. Only two springs were reported to be unfit for drinking purposes. Springs are located as follows:

<table>
<thead>
<tr>
<th>Twp.</th>
<th>Rge.</th>
<th>Number of Springs</th>
</tr>
</thead>
<tbody>
<tr>
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<td>53W</td>
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</tr>
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<td>125</td>
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<tr>
<td>126</td>
<td>55</td>
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</table>

<table>
<thead>
<tr>
<th>Twp.</th>
<th>Rge.</th>
<th>Number of Springs</th>
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<tbody>
<tr>
<td>126N</td>
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</tr>
<tr>
<td>127N</td>
<td>57W</td>
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</tr>
</tbody>
</table>

Only six springs were reported to be inadequate for the needs for which they were being used. Most are hard or moderately hard since 40 were reported with hard water, 24 medium and only three with soft water. The remainder were not reported on as to character.

Cisterns, of which 209 were reported, are used mostly for laundry and other soft water needs in hard water areas. Farmers with shallow pumped wells reported 168 cisterns, 10 being used for drinking and cooking and 153 for laundry purposes. Those with artesian wells reported 36, with 7 used for drinking and cooking and 23 for laundry purposes. The farmers reporting springs reported 5 cisterns, all of which were used for laundry purposes. There is approximately 1 cistern to every 4 wells.
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>Number of Wells</th>
<th>Depth of Wells</th>
<th>Character of Water</th>
<th>Adequacy of Supply</th>
<th>Total</th>
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<tr>
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<td>5 99 20</td>
<td>31 16 3</td>
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<td>1/8</td>
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<td>23</td>
<td>4 100 51</td>
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<td>2 4</td>
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<td>1 4</td>
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<td>10 6 1</td>
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<td>1 1</td>
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<tr>
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<td>3 30 23</td>
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<td>520</td>
<td>329 158 23</td>
<td>38 60</td>
<td>409 111 19</td>
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### MARSHALL COUNTY

#### Table 2.

**DATA ON PUMPED WELLS OVER 200 FEET IN DEPTH**

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<tr>
<th>LOCATION</th>
<th>DEPTH OF WELLS</th>
<th>CHARACTER OF WATER</th>
<th>ADEQUACY OF SUPPLY</th>
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<td><strong>Total</strong></td>
<td><strong>59</strong></td>
<td><strong>17 12 23 13 5</strong></td>
<td><strong>33 26 2 3/4</strong></td>
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</table>

Note: No wells reported for the following townships and ranges for this group:
MARSHALL COUNTY
Table 3
DATA ON FLOWING WELLS

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>Number of Wells</th>
<th>DEPTH OF WELLS</th>
<th>CHARACTER OF WATER</th>
<th>ADEQUACY OF SUPPLY</th>
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<td>-----------------</td>
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<tr>
<td>125</td>
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<td>2000 1500</td>
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<td>58</td>
<td>800 1350 945</td>
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<td>800 1000 897</td>
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<td>-</td>
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<td>1030 180 30</td>
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</table>

Note: No Flowing wells reported for the following townships and ranges: T.125N., R. 53, 54, 55, 56, 57W; T.126N., R. 53, 54, 55, 56W; T.127N., R. 53, 54, 55, 56W; T.128N., R. 54, 55W; T.129N., R. 43W.
MARSHALL 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. 125N., R. 54W.
SW\(\frac{1}{4}\) Sec. 2  "This farm has no well and can't get any."

Twp. 125N., R. 55W.
SW\(\frac{1}{4}\) Sec. 5  "There has been difficulties on my farm to put down wells, as it is all quicksand and if they shut out quicksand, they shut off the water too. We have tried three different places and it is all the same. There is plenty of water, but the fine sand always shuts it out."

Twp. 125N., R. 55W.
NE\(\frac{1}{2}\) Sec. 29  "We have two wells but not water enough."

Twp. 125N., R. 55W.
NE\(\frac{1}{2}\) Sec. 29  "Several holes have been dug, but we never found any water."

Twp. 125N., R. 56W.
NE\(\frac{1}{2}\) Sec. 19  "Water is hard to locate clear enough for stock and domestic use."

Twp. 125N., R. 57W.
NE\(\frac{1}{2}\) Sec. 13  "Had difficulty locating water veins."

Twp. 125N., R. 57W.
NW\(\frac{1}{4}\) Sec. 15  "The cattle will not drink this water if they can get other as water has a very strong taste. Impossible to drink."

Twp. 125N., R. 59W.
NW\(\frac{1}{4}\) Sec. 19  "I have two artesian wells,. First one drilled in 1923. Runs 3/4 gallon per minute. No. 2 drilled in 1926 has stopped several times. Runs about 1/4 gal. per. minute. Surface well is very poor."

Twp. 125N., R. 59W.
SW\(\frac{1}{4}\) Sec. 25  "No surface well can be had. Good flow about 250 feet when drilling the artesian."

Twp. 126N., R. 54W.
NE\(\frac{1}{2}\) Sec. 4  "Bitter taste."

Twp. 126N., R. 54W.
SE\(\frac{1}{2}\) Sec. 15  "Stock only."

Twp. 126N., R. 55W.
SW\(\frac{1}{2}\) Sec. 17  "Had three wells bored each about 100 feet about 1929 but did not get much water."

Twp. 126N., R. 56W.
SW\(\frac{1}{2}\) Sec. 30  "Could not strike water vein."
Twp. 126N., R. 57W.
SW_4 Sec. 4 12 feet:  
"There has been two holes dug on this farm; one to the depth of 90 feet and one 92 feet. The only place they can find water is in the creek."

Twp. 126N., R. 57W.
SE_4 Sec. 5 1000 feet:  
"Have had two other artesian wells on this farm; first two about 50 feet apart. The third about 150 feet from them. The first one the casing gave out, the second one quit flowing about 12 years ago, and then a few years later pumped sand and was unfit for use and later plugged the pump."

Twp. 126N., R. 57W.
SE_4 Sec. 5 1000 feet:  
"This well stopped flowing. Pumped it for several years. Started to throw sand which finally plugged pump."

Twp. 126N., R. 57W.
NW_4 Sec. 7 38 feet:  
"Artesian well stopped in spring of 1936. Dug a surface well June 1936. Struck water at 27 feet. Went deeper for water storage. About late fall this well almost dried up, probably on account of dry weather and has been very short ever since."

Twp. 126N., R. 57W.
NW_4 Sec. 8 1000 feet:  
"Too muddy to use. Was all right when flowing."

Twp. 126N., R. 57W.
NE_4 Sec. 13 180 feet:  
"Fourteen wells from 20 to 30 feet have been bored on farm. No dependable supply until present well was drilled."

Twp. 126N., R. 57W.
SW_4 Sec. 17 950 feet:  
"Have been unsuccessful in finding good surface well and need such now."

Twp. 126N., R. 57W.
SE_4 Sec. 20 40 feet:  
"Two other wells on farm have gone dry. Present well is not yet found faulty."

Twp. 126N., R. 58W.
NE_4 Sec. 18 930 feet:  
"Tried several places for shallow wells but struck no water. Went down 900 feet before striking the artesian flow."

Twp. 126N., R. 58W.
NW_4 Sec. 24 902 feet:  
"Went down 72 feet. Found nothing but blue clay about 32 years ago."

Twp. 126N., R. 58W.
NW_4 Sec. 27 1000 feet:  
"The water in this well appears clear and good for drinking but by straining three or four gallons through a white cloth tied at the faucet, the cloth will be a pure black color. I have bored 3 holes for water just for experimenting and struck water at about 15 feet and got two feet of water but never tested as to how much or how fast it runs."

Twp. 126N., R. 59W.
NE_4 Sec. 21 900 feet:  
"Cannot get surface well on account of quicksand. Went down 80 feet with tubular well and could not find water."
Twp. 126N., R. 59W.  
NW^2 Sec. 22  
900 feet:  
"Well is throwing sand. Has to haul drinking water."

Twp. 126N., R. 59W.  
SE^2 Sec. 24  
950 feet:  
"I am bothered with quicksand when digging shallow wells."

Twp. 127N., R. 59W.  
NE^2 Sec. 17  
30 feet:  
"The shallow well on this farm is not able to furnish water enough for any large amount of livestock, especially in dry seasons. The curb is not as it should be as it is quite old. Therefore letting in foreign matter which will contaminate the water, such as crickets, bugs, worms, etc."

Twp. 127N., R. 54W.  
NE^2 Sec. 14  
18 feet:  
"There is a spring in pasture quite a ways from the house where we water the cattle but fails to hold out at times if we have more cattle. Had to haul water from High Lake. Well in the yard holds out only for house and at times have hauled for the house. I have never been able to get a good well."

Twp. 127N., R. 55W.  
NW^2 Sec. 7  
10 feet:  
"There could be found water with quite a bit of work."

Twp. 127N., R. 56W.  
SW^2 Sec. 3  
54 feet:  
"We do not have drinking water on this farm. I have tried digging wells several times but all attempts have failed. Nearest source of drinking water is 1 1/2 miles."

Twp. 127N., R. 56W.  
NE^2 Sec. 12  
"Quite a number of years back we tried for water near the buildings digging three places, 87, 98, and 125 feet deep respectfully, but no water was found. We have hauled water for all domestic use for 6 years or more."

Twp. 127N., R. 56W.  
NE^2 Sec. 20  
42 feet:  
"Never really tried for more than 2 wells. One was never finished and was not located on water vein. Have plenty of water when there is plenty of rain. Not enough when it does not rain for a year or two."

Twp. 127N., R. 57W.  
SW^2 Sec. 4  
8 feet:  
"You will note that there is only 2 feet of water in my well. Reason for this is that quicksand washes in with the water so I cannot get any deeper. Have tried riving the curb ahead but even this fails to keep the sand from working around. Have plenty of water if we pumped often enough."

Twp. 127N., R. 57W.  
NW^2 Sec. 10  
35 feet:  
"We have two artesian wells on this farm. They have not flowed for 15 years."

Twp. 127N., R. 57W.  
NW^2 Sec. 19  
40 feet:  
"This well is never used for drinking or otherwise since dug. Seems to be something wrong the the water. Former tenant and owner told present tenant these facts."

Twp. 127N., R. 57W.  
NW^2 Sec. 20  
1000 feet:  
"When water is warmed it has an odor. No odor when first taken from well. When boiled will turn red."
Twp. 127N., R. 58W. NW¼ Sec. 17
26 feet: "This well is 4 feet down to 16 feet. Then drilled down 3 inch hole. Have trouble getting good water. There is plenty of it, but tastes strong of alkali."

Twp. 127N., R. 58W. NW¼ Sec. 17
22 feet: "This well has a very strong taste. Has never been bitter for use of drinking. It is not curbed. It seems as if there is too much alkali in the water."

Twp. 127N., R. 58W. SE¼ Sec. 17
24 feet: "Quicksand is the biggest trouble with wells in the locality."

Twp. 127N., R. 58W. NW¼ Sec. 32
950 feet: "Dug shallow well to blue clay. Not usable."

Twp. 127N., R. 58W. SE¼ Sec. 8
20 feet: "Quicksand is the trouble here when digging a well."

Twp. 127N., R. 59W. SE¼ Sec. 10
1000 feet: "This well just started flowing dirty water. It flowed mud last summer for the first time. Then it cleared up. Now it is black with mud. Has a very strong odor. This is about the oldest artesian well in Marshall county."

Twp. 127N., R. 59W. SE¼ Sec. 15
900 feet: "This water is very cold. Has tendency to eating out copper boilers but we have had new pipeline in since 1925. Never recased."

Twp. 127N., R. 59W. SW¼ Sec. 19
900 feet: "There are several places wells were dug but were no good. Reason for this is not known."

Twp. 127N., R. 59W. NE¼ Sec. 1
47 feet: "This water is very hard. It tastes good while drinking, leaves a very bitter taste after drinking. Water would not raise very much in well - had to dig a reservoir in order to have sufficient water."

Twp. 127N., R. 59W. NE¼ Sec. 24
1000 feet: "It seems as though there are no water veins running through my homestead."

Twp. 128N., R. 53W. SW¼ Sec. 11
125 feet: "Have to pump ten minutes before it clears up. Too rusty until then."

Twp. 128N., R. 53W. SW¼ Sec. 19
Spring: "This spring could be developed into a good well."

Twp. 128N., R. 53W. SW¼ Sec. 20
13 feet: "I had about 25 wells dug by hand and bored, but they all failed to give sufficient water. I rent a pasture in section 30. There is spring water in this pasture and that is where I water my livestock and also haul for poultry."
Twp.128N. , R. 53W. NW Sec. 33
30 feet:  "I have been hauling water the last 7 years for my cattle."

Twp.128N. , R. 54W. SW Sec. 23
27 feet:  "The wells on SW are dry most of the time. Large rocks at 6 to 30 feet make it very difficult to get good wells here."

Twp.128N. , R. 54W. NE Sec. 27
55 feet:
"Have dug ten holes averaging about 60 feet each and have been unable to get a satisfactory well."

Twp.128N. , R. 54W. SE Sec. 32
19 feet: Spring:
"Not very good. There is no water near buildings. There has been 3 holes dug but with no success. The well we have here is 1/2 mile from the buildings."

Twp.128N. , R. 54W. SE Sec. 34
21 feet: (dry hole)
"This well is abandoned and caved in. Am hauling water from my neighbors. Stock uses creek water."

Twp.128N. , R. 54W. NE Sec. 35
20 feet:
"At 17 feet anywhere you can strike gravel, but the water veins do not hold out. Two wells have been dug at 60 feet but they have been filled in."

Twp.128N. , R. 54W. NW Sec. 35
36 feet:
"The reason for dry holes is the water veins are too narrow. Must hit the center when you do there is plenty of water."

Twp.128N. , R. 56W. NW Sec. 6
855 feet:
"Our water at the present is not fit for house use. At times it is black. This is what they call three flow and at times looks like the mud flow looked when they went through it. This came on when they had the shake at Chamberlain, S.D."

Twp.128N. , R. 56W. NW Sec. 32
14 feet:
"Well has no water in at present on account of drought. Have to drive stock 1 mile to water. Need a well bad."

Twp.128N. , R. 58W. NW Sec. 33
800 feet:
"We have had trouble with surface wells on account of quicksand."