NORTH DAKOTA GEOLOGICAL SURVEY
Wilson M. Laird, State Geologist

BULLETIN 49

NORTH DAKOTA STATE WATER COMMISSION
Milo W. Hoisveen, State Engineer

COUNTY GROUND WATER STUDIES 10

Geology and Ground Water Resources

of

TRAILL COUNTY

Part 2–Basic Data

by

H. M. JENSEN
Geological Survey
United States Department of the Interior

Prepared by the United States Geological Survey
in cooperation with the North Dakota State
Water Commission, the North Dakota Geological Survey,
and the Traill County Board of Commissioners.

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This is one of a series of county reports published cooperatively by the North Dakota Geological Survey and the North Dakota State Water Commission. The reports are in three parts: Part I describes the geology, Part II presents ground water basic data, and Part III describes the ground water resources. Parts I and III will be published later and will be distributed as soon as possible.

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ILLUSTRATIONS

TABLES

GEOLOGY AND GROUND WATER RESOURCES OF TRAILL COUNTY, NORTH DAKOTA
PART II - GROUND WATER BASIC DATA

By

H. M. Jensen

INTRODUCTION

Purpose and Scope

The purposes of the investigation of the geology and ground-water resources of Traill County, N. Dak. (fig. 1) were to determine the location and extent of the ground water reservoirs (aquifers); to evaluate the occurrence and movement of ground water, including the sources of recharge and discharge; and to determine the chemical quality of the ground water. The investigation should provide sufficient information about the occurrence of ground water to plan its safe and intelligent development for irrigation, domestic, industrial, and municipal purposes.

The investigation was made cooperatively by the U.S. Geological Survey, North Dakota State Water Commission, North Dakota Geological Survey, and the Traill County Board of Commissioners. The results of the investigation will be published in three separate parts of the bulletin series of the North Dakota Geological Survey and the county ground-water studies series of the North Dakota State Water Commission. Part I is an interpretive report describing the geology, Part II is a compilation of the ground-water basic data, and Part III is an interpretive report describing the ground-water resources. Part II makes available hydrologic data collected during the county investigation and functions as a reference for Parts I and III.

The information in this report consists of the following: (1) data on about 1,540 wells, springs, and test holes; (2) water-level measurements in 22 observation wells; (3) logs of about 160 test holes and selected wells; and (4) chemical analyses of 70 water samples.

The data in this report are useful for predicting geologic and ground-water conditions in Traill County. For example, a person considering the construction of a new well can locate the proposed site on figure 3. The characteristics of nearby wells may be determined from table 1, and the water-level fluctuations in the area may be determined from table 2. The type of material encountered in nearby wells may be determined from table 3 and the chemical quality of water in adjacent wells may be determined from table 4. However, such extrapolations should be made conservatively because of the irregular distribution of the water-bearing rocks.

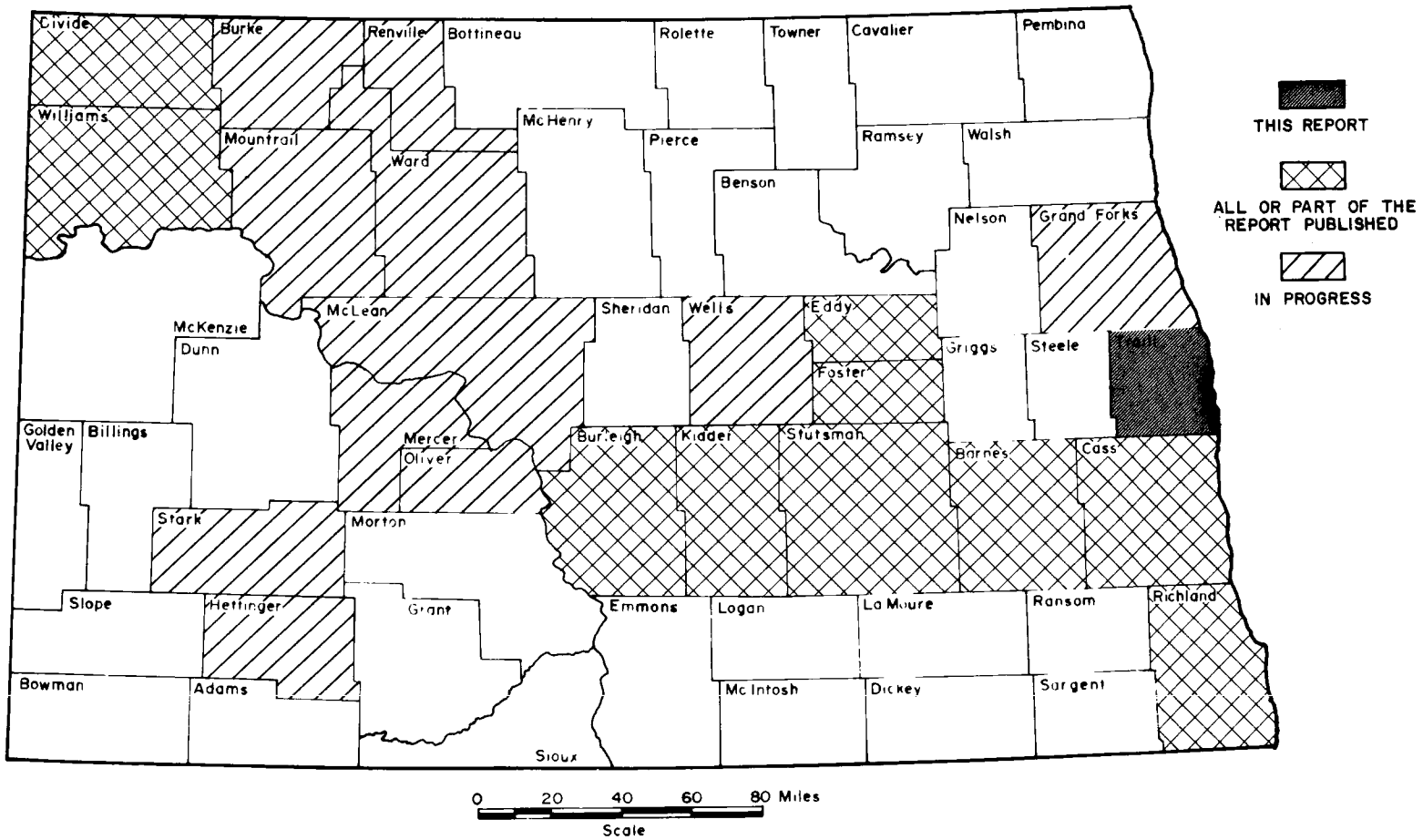

Figure 1. Location of county ground-water studies.

Well-Numbering System

The wells, springs, and test holes in the tables are numbered according to a system based on the location in the public land classification of the United States Bureau of Land Management. It is illustrated in figure 2. The first numeral denotes the township north of a base line, the second numeral denotes the range west of the fifth principal meridian, and the third numeral denotes the section in which the well is located. The letters a, b, c, and d designate, respectively, the northeast, northwest, southwest, and southeast quarter sections, quarter-quarter sections, and quarter-quarter-quarter sections (10-acre tract). For example, well 148-58-15daa is in the $NE\frac{1}{4}NE\frac{1}{4}SE\frac{1}{4}$ sec. 15, T. 148 N., R. 58 W. Consecutive terminal numerals are added if more than one well is recorded within a 10-acre tract. The location of each well, spring, and test hole listed in the tables is shown on figure 3 (in pocket).

Acknowledgments

Most of the test holes were drilled by the North Dakota State Water Commission. The cooperation of the residents of the county, municipal and county officials, and well drillers who supplied general and specific information on farm, domestic, and municipal well installations is gratefully acknowledged.

EXPLANATION OF TABLES

The logs in table 3, except those furnished by commercial drilling companies, are composites of drillers' descriptions, sample analyses, and electric logs (where available Visual methods (megascopic and microscopic) were used to describe the composition and texture of the subsurface rock samples. Color descriptions were determined by comparing the sample with the Geological Society of America rock-color chart (1963). If the cuttin reacted (effervesced) when treated with dilute hydrochloric acid, the material was described as calcareous. Grain size determinations used in the logs refer to the Wentworth (1922) size scale.

The terminology in the commercial logs, except for the term "till," is that of the driller and only the order of description has been changed so as to present the principal lithology first.

Well logs noted in table 1, but not listed in table 3, may be obtained by consulting the appropriate published reports or by inquiring at one of the offices of cooperating federal or state agencies.

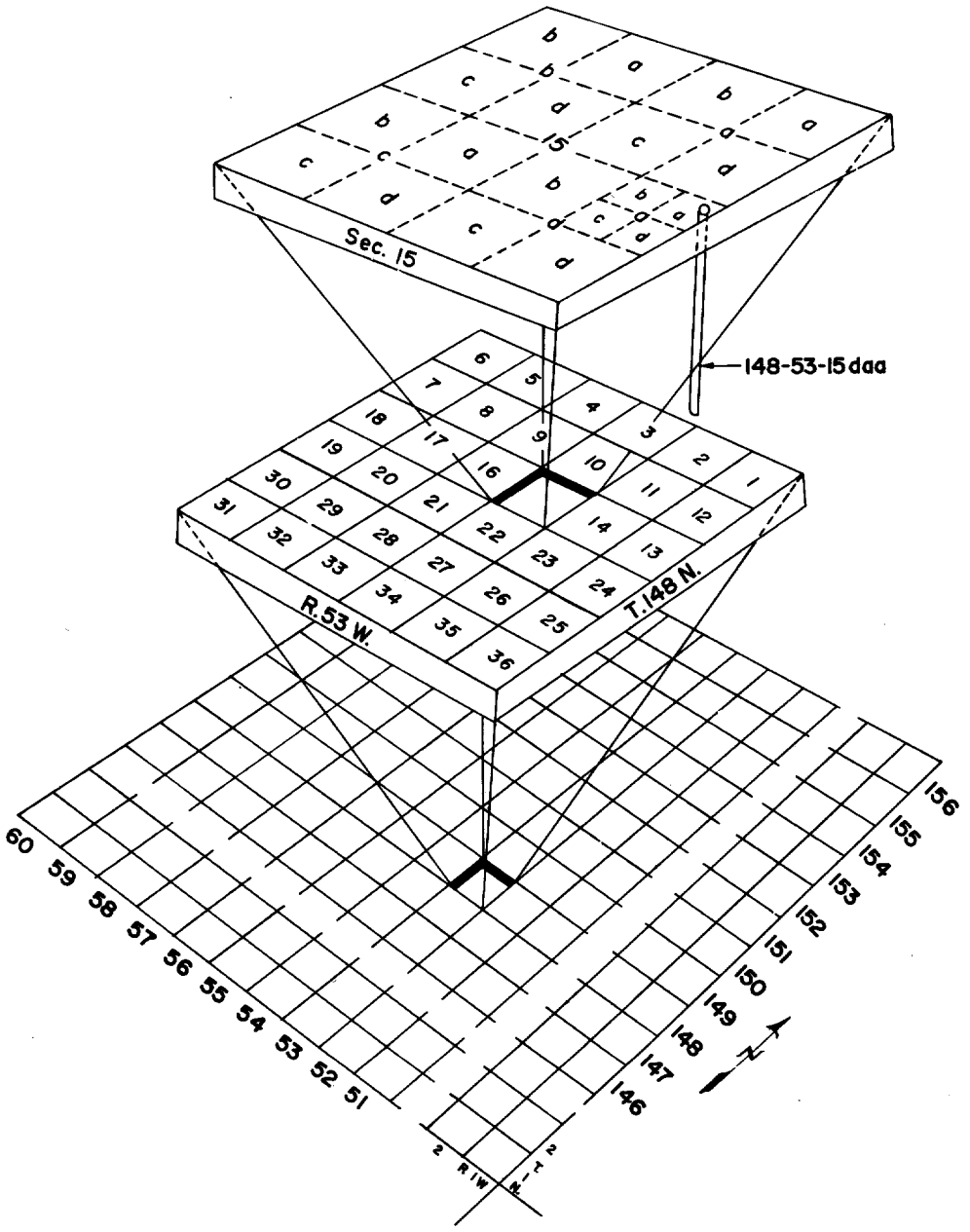

Figure 2. System of numbering wells, springs and test holes.

The term "till" indicates an unsorted, unstratified, cohesive, agglomeration of rock particles ranging from clay to boulders. Generally clay is the predominant particle size. If a particle size other than clay is dominant, that particle size is used as a modifying term. Consequently, terms such as silty, sandy, or gravelly are textural terms used to indicate that the material described contains an appreciable, but not a dominant amount of the modifying material.

Observation wells were developed in selected test holes. These consist for the most part of 1¼-inch plastic pipe, slotted in the lower 10 or 20 feet or screened in the lower 5 feet. They were pumped for a few hours and a water sample was collected for chemical analysis (table 4).

The monthly water-level measurements listed in table 2 were made during this investigation. Records of water-level fluctuations in wells in Traill County prior to this study have been published in U.S. Geological Survey Water-Supply Papers 817, 840, 84: 886, 908, 938, 946, 988, 1018, 1025, 1073, 1098, 1128, 1158, 1167, 1193, 1223, 1267, 1323, 1406, and 1456.

WATER-QUALITY DATA

All natural waters contain dissolved mineral matter. Water in contact with soils or rock, even for only a few hours, will dissolve some mineral matter. The quantity of dissolved mineral matter in a natural water depends primarily on the type of rocks or soils with which the water has been in contact and the length of time of contact. Ground water is generally more highly mineralized than surface water because it remains in contact with the rocks and soils for much longer periods.

The mineral constituents and physical properties of natural waters reported in the table of analyses include those that have a practical bearing on the value of the waters for most purposes. The analyses generally include determinations of silica, iron, calcium, magnesium, sodium, potassium (or sodium and potassium together calculated as sodium), alkalinity as carbonate and bicarbonate, sulfate, chloride, fluoride, nitrate, boron, dissolved solids, pH, and specific conductance. The source and significance of the different constituents and properties of natural waters are discussed in the following paragraphs.

Mineral Constituents in Solution

Silica (SiO_2)

Silica is dissolved from practically all rocks. Some natural waters contain less than 5 ppm (parts per million) of silica and few contain more than 50 ppm, but the more

common range is from 10 to 30 ppm. Silica affects the usefulness of a water because it contributes to the formation of scale in pipes, water heaters, and boilers.

Iron (Fe)

Iron is dissolved from many rocks and soils. On exposure to air, normal basic waters that contain more than 1 ppm of iron soon become turbid with the insoluble reddish ferric oxide produced by oxidation. Surface waters, therefore, seldom contain as much as 1 ppm of dissolved iron, although some acid waters carry large quantities of iron in solution. Ground waters commonly contain up to 10 ppm. Rarely, concentrations over 50 ppm may occur in waters with a pH of 5 to 8 (Hem, 1959). Iron causes reddish-brown stains on porcelain or enameled ware and fixtures and on fabrics washed in the water. The U.S. Public Health Service (1962) recommends an upper limit of 0.3 ppm of iron in drinking water.

Calcium (Ca)

Calcium is dissolved from almost all rocks and soils. Calcium and magnesium cause hard water and are largely responsible for the formation of scale in pipes, water heaters, and boilers. Water associated with granite or silicious sands may contain less than 10 ppm of calcium, whereas water associated with dolomite and limestone may contain from 30 to 100 ppm. Water that has been in contact with deposits of gypsum may contain several hundred parts per million calcium.

Magnesium (Mg)

Magnesium is dissolved from many rocks, particularly from dolomitic rocks. Its effect in water is similar to that of calcium. The magnesium in soft waters may amount to only 1 or 2 ppm, but water in areas that contain large quantities of dolomite or other magnesium-bearing rocks may contain from 20 to 100 ppm or more of magnesium.

Sodium and potassium (Na and K)

Sodium and potassium are dissolved from practically all rocks. Sodium is the predominant cation in some of the more highly mineralized waters found in the western United States. Natural waters that contain only 3 or 4 ppm of the two together are likely to carry almost as much potassium as sodium. As the total quantity of these constituents increases, the proportion of sodium becomes much greater. However, the potassium concentration in water does not often exceed 50 ppm. Moderate quantities of sodium and potassium have little effect on the usefulness of the water for most purposes, but waters that carry more than 50 or 100 ppm of the two may require careful operation of steam boilers to prevent foaming. More highly mineralized waters that contain a

large proportion of sodium salts may be unsatisfactory for irrigation. The presence of several hundred parts per million of sodium in water makes it unsuitable for use in sodium-restricted diets used as therapy for cardiovascular diseases.

Bicarbonate and carbonate (HCO_3 and CO_3)

Bicarbonate and carbonate are sometimes reported as alkalinity. Since the major causes of alkalinity in most natural waters are carbonate and bicarbonate ions dissolved from carbonate rocks, the results are usually reported in terms of these constituents. Although alkalinity is primarily due to the presence of carbonate and bicarbonate, other ions also contribute to alkalinity such as silicates, phosphates, borates, possibly fluoride, and certain organic anions which may occur in colored waters. The significance of alkalinity to the domestic, agricultural, and industrial user is usually dependent upon the nature of the cations (Ca, Mg, Na, K) associated with it. However, moderate amounts of alkalinity do not adversely affect most use.

Sulfate (SO_4)

Sulfate is dissolved from many rocks and soils--in especially large quantities from gypsum and from beds of shale. It is formed also by the oxidation of sulfides of iron and may therefore be present in considerable quantities in mine waters. The concentration of sulfate in waters is generally limited to about 1,500 ppm by the solubility of calcium sulfate. Sulfate in waters that contain much calcium and magnesium causes the formation of hard scale in steam boilers and may increase the cost of softening the water. The U.S. Public Health Service (1962) recommends that 250 ppm of sulfate should be the upper limit for drinking water.

Chloride (Cl)

Chlorides are generally very soluble compounds and are found in most rocks so that chlorides are found in all natural waters. Large quantities of chloride may affect the industrial use of water by increasing the corrosiveness of waters that contain large quantities of calcium and magnesium. The U.S. Public Health Service (1962) recommends an upper limit of 250 ppm of chloride for drinking water.

Fluoride (F)

Fluoride has been reported as being present in igneous and some sedimentary rocks to about the same extent as chloride. However, most fluorides, unlike the chlorides, are low in solubility so that the quantity of fluoride in natural waters is ordinarily very small compared to that of chloride. Hem (1959) reported that fluoride concentrations

in excess of 10 ppm are rare. Investigations have proved that fluoride concentrations of about 0.6 to 1.7 ppm reduced the incidence of dental caries and that concentrations greater than 1.7 ppm also protect the teeth from cavities but cause an undesirable black stain (Durfor and Becker, 1964). U.S. Public Health Service (1962, p. 8) states, "When fluoride is naturally present in drinking water, the concentration should not average more than the appropriate upper control limit (0.6 to 1.7 ppm). Presence of fluoride in average concentrations greater than two times the optimum shall constitute grounds for rejection of the supply." Concentration higher than the stated limits may cause mottled enamel in teeth, endemic cumulative fluorosis, and skeletal effects.

Nitrate (NO_3)

Nitrate in water is considered a final oxidation product of nitrogeneous material and may indicate contamination by sewage or other organic matter. U.S. Public Health Service (1962) sets 45 ppm as the upper limit for nitrate because ingestion of water containing more than this may result in infantile methemoglobinemia. If the concentration is sufficiently great, both man and animals can be poisoned by nitrate.

Boron (B)

Boron in small quantities has been found essential for plant growth, but irrigation water containing more than 1 ppm boron is detrimental to navy beans and other boron-sensitive crops.

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic matter and water of crystallization. Waters with less than 500 ppm of dissolved solids are usually satisfactory for domestic and some industrial uses. Water containing several thousand parts per million of dissolved solids are sometimes successfully used for irrigation where practices permit the removal of soluble salts through the application of large volumes of water on well-drained lands, but generally water containing more than about 2,000 ppm is considered to be unsuitable for long-term irrigation under average conditions.

Properties and Characteristics of Water

Temperature

Temperature is an important factor in properly determining the quality of water. This is very evident for such a direct use as an industrial coolant. Temperature is

also important, but perhaps not so evident, for its indirect influence upon concentrations of dissolved gases and distribution of chemical solutes in ground water. Normally, the temperature of ground water within 60 feet of the surface approximates the mean annual air temperature and increases 1° F for each 60 to 100 feet increase with depth.

Hardness

Hardness is the characteristic of water that receives the most attention in industrial and domestic use. It is commonly recognized by the increased quantity of soap required to produce lather. The use of hard water is also objectionable because it contributes to the formation of scale in boilers, water heaters, radiators, and pipes, with the resultant decrease in rate of heat transfer, possibility of water heater or boiler failure, and loss of flow.

Hardness is caused almost entirely by compounds of calcium and magnesium. Other constituents--such as iron, manganese, aluminum, barium, strontium, and free acid--also cause hardness, although they usually are not present in quantities large enough to have any appreciable effect.

Generally, bicarbonate and carbonate determine the proportions of "carbonate" hardness of water. Carbonate hardness is the amount of hardness chemically equivalent to the amount of bicarbonate and carbonate in solution. Carbonate hardness is approximately equal to the amount of hardness that is removed from water by boiling and is termed temporary hardness.

Noncarbonate hardness is the difference between the hardness calculated from the total amount of calcium and magnesium in solution and the carbonate hardness. If the carbonate hardness (expressed as calcium carbonate) equals the amount of calcium and magnesium hardness (also expressed as calcium carbonate) there is no noncarbonate hardness. Noncarbonate hardness is about equal to the amount of hardness remaining after water is boiled. The scale formed at high temperatures by the evaporation of water containing noncarbonate hardness commonly is tough, heat resistant, and difficult to remove.

Although many people talk about soft water and hard water, there has been no firm line of demarcation. Water that seems hard to an easterner may seem soft to a westerner. The U.S. Geological Survey has adopted the following classification:

Hardness range (calcium carbonate in ppm)	Hardness description
0-60	Soft
61-120	Moderately hard
121-180	Hard
more than 180	Very hard

For public use, water with hardness about 200 ppm generally requires softening treatment (Durfor and Becker, 1964).

Sodium-adsorption ratio (SAR)

The term "sodium-adsorption ratio (SAR)" was introduced by the U.S. Salinity Laboratory Staff (1954). It is a ratio expressing the relative activity of sodium ions in exchange reaction with soil and is an index of the sodium or alkali hazard to the soil. Sodium-adsorption-ratio is expressed by the equation:

$$SAR = \frac{Na+}{\sqrt{\frac{Ca++ + Mg++}{2}}}$$

where the concentrations of the ions are expressed in milliequivalents per liter (or equivalents per million for most irrigation waters).

Waters are divided into four classes with respect to sodium or alkali hazard: low, medium, high, and very high, depending upon the SAR and specific conductance. At a conductance of 100 micromhos per centimeter the dividing points are at SAR values of 10, 18, and 26; but at 5,000 micromhos the corresponding dividing points are SAR values of approximately 2.5, 6.5, and 11. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Specific conductance (micromhos per centimeter at 25° C)

Specific conductance is a convenient, rapid determination used to estimate the amount of dissolved solids in water. It is a measure of the ability of water to conduct an electrical current. Commonly, the amount of dissolved solids (in parts per million) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from well to well and it may even vary in the same source with changes in the composition of the water (Durfor and Becker, 1964).

Specific conductance of most waters in the eastern United States is less than 1,000 micromhos, but in the arid western parts of the country, a specific conductance of more than 1,000 micromhos is common.

Hydrogen-ion concentration (pH)

Hydrogen-ion concentration is expressed in terms of pH units. The values of pH often are used as a measure of the solvent power of water or as an indicator of the chemical behavior certain solutions may have toward rock minerals.

The degree of acidity or alkalinity of water, as indicated by the hydrogen-ion concentration, expressed as pH, is related to the corrosive properties of water and is useful in determining the proper treatment for coagulation that may be necessary at water-treatment plants. A pH of 7.0 indicates that the water is neither acid nor alkaline. Readings progresively lower than 7.0 denote increasing acidity and those progressively higher than 7.0 denote increasing alkalinity. The pH of most natural ground waters ranges between 5.5 and slightly more than 8.

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TABLE 1.--Records of wells, springs, and test holes

Depth of well and water level: Reported depths below land surface are given in feet; measured depths are given in feet, tenths, and (or) hundredths; + indicates water level above land surface.

Type of well: B, bored; Dr, drilled; Du, dug; Dv, driven.

Use of water: D, domestic; Ind, industrial; N, none; O, observation well; PS, public supply, S, stock; T, test hole.

Altitude: Altitudes determined with matched surveying altimeters or interpolated from topographic maps.

Remarks: Unless otherwise indicated, water supply is adequate. C, chemical analysis given in table 4; CB, CH, CHi, CP, CR, chemical analyses published in Buxton, Hatton, Hillsboro, Portland, or Reynolds report; gpd, gallons per day; gpm, gallons per minute; L, log given in table 3; LB, LH, LHi, LP, LR, log published in Buxton, Hatton, Hillsboro, Portland, or Reynolds report; LL, log published by Laird and others, 1952; SC, specific conductance in micromhos per centimeter at 25° C; W, water-level measurements given in table 2.

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date completed	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
144-49											
4ddd	Frank Harrington	184	2	Dr	....	20	7- 8-58	D,S	Sand	.....	Inadequate supply
6dc	Alfred Aasland	174	3	Dr	1875	27	7- 7-58	D,S	Sand	.....	
8cac	Oliver Seim	184	3	Dr	1954	20	7- 8-58	D,S	Sand	.....	
9aaa	Charles Harrington	300	2	Dr	1929	20	7- 8-58	D,S	Gravel	.....	
12bbd	Jim Paulsrud	267	2	Dr	1943	6	7- 7-58	D,S	Sand	.....	
14baa	O. and G. Anderson	267	3	Dr	....	8	7- 7-58	N	Sand	.....	
14bcc	Charles Harrington	308	3	Dr	1953	20	7- 7-58	D,S	Sand	.....	
14ccc	Oscar M. Anderson	317	3	Dr	1919	10	7- 8-58	D,S	Sand	.....	
16cdc	Clifford Lusso	140	2	Dr	1924	14	7- 8-58	D,S	Sand and gravel	.....	C
16dd	Frank Grady	186	3	Dr	....	10	7- 7-58	D,S	Sand	.....	
17ccc	Lewis Lusso	300	2	Dr	1930	7	7- 8-58	D,S	Sand	.....	

18bac	Martin Martinson	293	3	Dr	1900	3	7- 8-58	D,S	Sand	.....	
18cbb	Joe W. Anderson	286	3	Dr	1943	Flow	7- 8-58	D,S	Sand	.....	
19aa	Dalrymple farm	295	3	Dr	....	10	7- 8-58	D,S	Sand	.....	
20bb	Jasper Haaland	298	3	Dr	....	9	7- 8-58	D,S	Sand	.....	
20ddd	Magnuson	375	3	Dr	1933	6	7- 9-58	S	Sand	.....	C
21baa	Charles Smart	144	3	Dr	1946	15	7- 8-58	D,S	Sand	.....	SC 1,850
22bbd	Raymond Scholl	170	3	Dr	1944	10	7- 7-58	D,S	Sand	.....	SC 2,400
22dda	Harvey Scoville	187	2	Dr	1938	10	7-11-58	D,S	Sand	.....	SC 2,880
23dcc	Harry Mursden	175	3	Dr	1951	7	7-10-58	D,S	Sand	.....	
26bbc	W. A. Hall	167	3	Dr	1950	12	7-11-58	D,S	Sand	.....	
26dbb	C. R. Berg	189	2	Dr	1922	7	7-10-58	D,S	Gravel	.....	
27adb	Arnott McCradie	125	2	Dr	....	Flow	7-10-58	D,S	Sand	.....	
27daa	Ernie Johnson	125	3	Dr	....	20	7-10-58	N	Sand	.....	
28abb	Bill Harrington	250	3	Dr	....	10	7-11-58	D,S	Sand	.....	
29bbb	Magnuson	280	3	Dr	1956	6	7- 9-58	S	Sand	.....	SC 3,700
31dcd	Bertha Weller	275+	3	Dr	....	4	7-11-58	D,S	Sand	.....	SC 4,220
33add	Victor Johnson	200	4	Dr	....	20	7-11-58	D,S	Sand	.....	SC 2,400
34aad	Margret and Ray McCradie	300	3	Dr	1920	40	7-10-58	D,S	Sand	.....	
35abd	Clayton Berg	200+	2½	Dr	....	Flow	7-10-58	D,S	....	.....	
144-50											
2dd	William Anderson	180	4	Dr	1936	4	7- 7-58	D,S	Sand	.....	
3cdb	John S. Dalrymple	...	2	Dr	....	6.21	7- 8-58	S	Sand	.....	
5abc	Ed Dahlstrom	140	4	Dr	1951	14	7- 8-58	D,S	Sand	.....	
6daa	J. R. Kritzberger	200	3	Dr	....	10	7-11-58	N	Sand	.....	
7aa	Morris Thompson	173	3	Dr	....	10	7-11-58	D,S	Sand	.....	
7baa	Ole Elton	435	3	Dr	1955	3	7-11-58	D,S	Sand	.....	
10bbb	Leroy Brennan	165	2	Dr	....	10	7-11-58	D,S	Sand	.....	
12baa	C. Larson	185	3	Dr	1941	7	7- 7-58	S	Sand	.....	
12cca	Tom Reid	180	3	Dr	1941	1	7- 8-58	D,S	Gravel	.....	C
13add	S. A. McCoy	320	2	Dr	1918	Flow	7- 8-58	D,S	Sand	.....	C
13bba	Lester Belcher	170	3	Dr	....	3	7- 8-58	N	Gravel	.....	
14aaa	Tom Reid	175	3	Dr	....	Flow	7- 8-58	N	Gravel	.....	
14cbb	do.	120	3	Dr	....	3	7- 8-58	N	Gravel	.....	Used to flow.
15bcb	Warren McInnes	230	3	Dr	....	Flow	7-11-58	D,S	Sand	.....	
17aab	H. Dahlstrom	385	4	Dr	1950	Flow	7- 8-58	D,S	Sand	.....	
18bcc	Willis Wiger	130	3	Dr	....	9	7-15-58	D,S	Sand and gravel	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date completed	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
144-50, Cont.											
18ddd	Dalrymple	468	2	Dr	1954	Flow	7-15-58	D,S	Sand	.....	Flows 0.5 gpm
21cdc	Harold Stokke	168	2	Dr	1959	3	9-30-65	D,S	Sand and gravel	.....	C
22bcc	Leroy Brennan	240	3	Dr	....	Flow	7-11-58	S	Sand	.....	Flows 3 gpm
22cdd	do.	165	2	Dr	....	Flow	7- 8-58	D,S	Sand	.....	Flows 0.5 gpm
25ab	Lockhart	170	..	Dr	....	4	7-10-58	D	Sand	.....	
26ccb1	J. L. Anderegg	136	4	Dr	....	9	7-14-58	D	Sand	.....	C
26ccb2	do.	141	2	Dr	....	5.45	9-30-65	O	Sand	.....	W
30bcc	Robert McSparron	380	3	Dr	1946	8	7-14-58	D,S	Sand	.....	
30cbb	Test hole 2372	178.5	5	Dr	1965	..	.....	T	....	918	L
30ccl	Arnold Thorsrud	58	2	Dr	....	..	.....	D	Sand	.....	
30cc2	do.	60	3	Dr	....	..	.....	S	Sand	.....	
30ccd	Test hole 194	42	4	Dr	1960	35	6-23-60	T	....	916	L
31cdd	Mansfield	300	4	Dr	1929	20	7-16-58	S	Sand	.....	
32add1	Roy Satrom	134	3	Dr	....	20	7-16-58	D,S	Sand	.....	
32add2	do.	176	3	Dr	1958	6	7-16-58	D,S	Sand	.....	
33bbc	Edwin Buringrud	315	4	Dr	....	8	7-16-58	D,S	Sand	.....	
34acd1	Paul Gunkelman	150	..	Dr	1956	4	7-11-58	S	Gravel	.....	
34acd2	do.	400	..	Dr	1938	8	7-11-58	D	Gravel	.....	
34bca	R. G. Lockhart	190	2	Dr	1954	6	7-11-58	D,S	Sand	.....	
34caa	Neil MacFarlane	179	3	Dr	1936	6	7-11-58	D,S	Sand	.....	
34ccd	August Grothmann,Sr.	137	3	Dr	1936	3	7-11-58	D,S	Sand	.....	
36abb	Test hole 2539	356	5	Dr	1966	..	.....	T	....	881	L
36ccc	Daniel Downs	167	3	Dr	....	4.78	7-10-58	D,S	Sand	.....	
144-51											
1dcd	Test hole 192	75	4	Dr	1960	..	.....	T	....	915	L
2aba	Test hole 2380	105	5	Dr	1965	..	.....	T	....	930	L
2baa	Bennie Fortmann	422	2	Dr	1914	Flow	7-15-58	D,S	Sand	.....	
3daa	Wilton Ludwig	300+	2	Dr	1932	Flow	7-15-58	D,S	Sand	.....	

4ccc	George Thompson	284	3	Dr	1950	Flow	7-15-58	D,S	Sand	.....	Flows 1 gpm
5dda	Arthur Chenault	300+	3	Dr	1955	Flow	7-15-58	D,S	Sand	.....	Flows 0.5 gpm
6dad	Walter Willison	265	3	Dr	1925	Flow	7-15-58	D,S	Sand	.....	
7ddd	J. S. Dalrymple	...	3	Dr	....	Flow	7-15-58	D,S	Sand	.....	Flows 1 gpm
8aac	G. C. Willison	285	2	Dr	....	Flow	7-16-58	D,S	Sand	.....	
9bbc	Morris Thompson	285	..	Dr	....	Flow	7-15-58	D,S	Sand	.....	
10bdb	Mrs. F. Bohnsack	400	3	Dr	1953	10	7-16-58	D,S	Sand	.....	
10dcb	Walter Bohnsack	480	3	Dr	....	Flow	7-16-58	D,S	Sand	.....	Flows 2 gpm
11baa	Leo Walters	410	3	Dr	1948	Flow	7-15-58	D,S	Sand	.....	
12abb	Orville Wiger	75	3	Dr	1953	14	7-15-58	D,S	Sand	.....	C
12dcc	Observation well	120	1¼	Dr	1965	26.73	10- 4-65	0	Sand	925	C, L, W, test hole 2
13dcd	Test hole 193	57	4	Dr	1960	..	.....	T	....	926	L
14cba	Erwin Bohnsack	425	1¼	Dr	....	Flow	7-16-58	D,S	Sand	.....	Flows 0.7 gpm
15abc	County School	400	3	Dr	....	Flow	7-15-58	D	Sand	.....	Flows 1.5 gpm
15add	Keith Porter	210	3	Dr	....	6	7-14-58	D,S	Sand	.....	
16aac	Richard Rachow	336	2	Dr	1908	Flow	7-15-58	D,S	Sand	.....	Flows 2 gpm
17bbb	Joe Nilles	125	2	Dr	....	Flow	7-15-58	D,S	Sand	.....	Flows 3 gpm
19ccb	Robert Tate	250	3	Dr	....	Flow	7-15-58	D,S	Sand	.....	Flows 1.5 gpm
20cdd	Dalrymple	90+	3	Dr	....	Flow	7-15-58	D,S	Sand	.....	Flows 2 gpm
21ddd	Fred Schwalbe	400	2	Dr	....	Flow	7-15-58	D	Sand	.....	Flows 1 gpm
22cdd	Dale Peterson	400	3	Dr	1948	Flow	7-15-58	D,S	Sand	.....	Flows 2 gpm
24bd	Gene Porter	80	3	Dr	....	20	7-22-58	S	Sand	.....	
24dd	Dunbar McSparron	385	3	Dr	1948	14	7-14-58	D,S	Sand	.....	
25ddc	Percy Stuart	57	3	Dr	1957	..	.....	D,S	Sand	.....	
26cbb	Lester Peterson	375	..	Dr	1917	Flow	7-14-58	D,S	Sand	.....	
26ddc	L. E. Dally	400	..	Dr	1900	Flow	7-16-58	D,S	Sand	.....	
27bbc	L. N. Porter	380	3	Dr	1917	Flow	7-15-58	D,S	Sand	.....	Flows 2.5 gpm
28aa	Robert Porter	400+	2	Dr	....	Flow	7-14-58	D,S	Sand	.....	
28dda	Keith Porter	420	2	Dr	....	Flow	7-14-58	D,S	Sand	.....	C
29bab	Ed Tate	120	3	Dr	....	Flow	7-15-58	D,S	Sand	.....	Flows 1.5 gpm
30bbb	Will Tate	250	3	Dr	....	Flow	7-15-58	D,S	Sand	.....	Flows 1.5 gpm
30ddd	Mrs. L. Widley	300+	3	Dr	....	Flow	7-15-58	D,S	Sand	.....	Flows 3 gpm
31bba	Emil Tetzlaff	350	3	Dr	1934	Flow	7-15-58	D,S	Sand	.....	Flows 0.5 gpm
31cac	Fred Siegert	400	3	Dr	1914	Flow	7-15-58	D,S	Sand	.....	Flows 1.5 gpm
32abb	John Buethner	230	2	Dr	1914	Flow	7-15-58	D,S	Sand	.....	Flows 50 gpd
33aa	A. Porter	370	3	Dr	....	Flow	7-14-58	D,S	Sand	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date completed	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
144-51, Cont.											
33bab	Henry Wist	315	3	Dr	1915	Flow	7-14-58	D,S	Sand	.....	C, flows 1 gpm
33cdd	Conrad Griesbach	350	3	Dr	1917	Flow	7-14-58	D,S	Gravel	.....	
34adb	Henry Ludwig	550	..	Dr	1920	0	7-14-58	D,S	Sand	.....	
34ccd	Mrs. L. Porter	135	3	Dr	....	6	7-14-58	D,S	Sand	.....	
34dda	Arnold Radebaugh	165	3	Dr	1955	+10	7-14-58	D,S	Sand	.....	
34ddd	do.	450	3	Dr	1953	5	7-14-58	S	Sand	.....	
36ddd	Test hole 2540	105	5	Dr	1966	..	.....	T	....	920	L
144-52											
1bbb	H. Hoffman	...	..	Dr	1938	Flow	7-22-58	S	Sand	.....	
1cdc	Test hole 183	32	4	Dr	1960	..	.....	T	....	941	L
2ccc	Bill Ballard	456	2	Dr	1947	Flow	7-16-58	D,S	Sand	.....	Flows 8 gpm
3ccc	Test hole 182	22	4	Dr	1960	..	.....	T	....	975	L
3ddd	Ralph Thompson	430	3	Dr	....	Flow	7-16-58	D,S	Sand	.....	Flows 3 gpm
4acc	M. Elken	410	..	Dr	....	Flow	7-16-58	D,S	Sand	.....	Flows 1 gpm
4ccc	Test hole 179	22	4	Dr	1960	..	.....	T	....	985	L
4dd	Test hole 181	42	4	Dr	1960	..	.....	T	....	974	L
5dcd	Test hole 178	27	4	Dr	1960	..	.....	T	....	994	L
5ddd	Benny Kyllo	90	48	Du	1910	25	7-16-58	D,S	Gravel	.....	
6abc	George N. Knudson	450	2	Dr	1947	Flow	7-16-58	D,S	Sand	.....	
7aaa	Markas Elkan	500	..	Dr	....	..	.....	N	Sand	.....	
7abb	Test hole 213	17	4	Dr	1960	..	.....	T	....	1,001	L
7cdd	Test hole 172	27	4	Dr	1960	..	.....	T	....	1,036	L
8aaa	Moritz Gorum	165	4	Dr	1913	12	7-16-58	D,S	Sand	.....	
8cbb	A. Aarsvold	30	..	Du	....	25	7-22-58	D,S	Sand	.....	
9ab	Test hole 180	42	4	Dr	1960	..	.....	T	....	972	L
10aaa	Olav Aarsvold	447	3	Dr	1937	Flow	7-16-58	D,S	Sand	.....	LL, flows 0.5 g
12ccc	Roy Reinan	400	2	Dr	1937	Flow	7-15-58	D,S	Sand	.....	Flows 1 gpm
13bbb	Asa Sherritt	280	3	Dr	....	Flow	7-15-58	D,S	Sand	.....	Flows 0.5 gpm

14aaa	do.	200	3	Dr	....	Flow	7-16-58	D,S	Sand	.....	Flows 2 gpm
15bbb	Orville G. Erickson	25	48	Du	1949	10	7-16-58	D,S	Sand	.....	Inadequate supply
15cdd	Edwin Kyllo	400	2	Dr	1920	0	7-16-58	D,S	Sand	.....	
16dcd1	Floyd S. Erickson	15.49	36	Du	....	10.32	7-16-58	S	Sand	.....	Inadequate supply
16dcd2	do.	25	36	Du	....	10	7-16-58	D	Sand	.....	
16dcd3	do.	340	3	Dr	1960	15	1960	D,S	....	.....	
17aa	Harry Olson	665	2	Dr	1928	Flow	7-16-58	D,S	Sand	.....	C, flows 1.5 gpm
18dd	Frank Baldock	20	48	Du	1943	10	7-16-58	D	Sand	.....	
19ccc	Test hole 217	12	4	Dr	1960	..	.....	T	....	1,047	L
19cdd	Olson Bros.	26.38	48	Du	....	14.31	7-16-58	D	Gravel	.....	
19dcc	Test hole 171	21	4	Dr	1960	..	.....	T	....	1,046	L
20aac	John Halvorson	25	60	Du	1932	6	7-16-58	D,S	Clay	.....	
20ccc	Herman Nelson	54	..	Dr	1951	12	7-16-58	D,S	Sand	.....	
20ddc	Magnus Kleven	37	3	Dr	....	25	7-16-58	D,S	Clay	.....	
21aab	Floyd Erickson	27.5	24	B	....	10.63	9-30-65	O	Sand	.....	W
21ccc	Test hole 218	27	4	Dr	1960	..	.....	T	....	1,007	L
21cdb	Gerald S. Kyllo	22	36	Du	....	10	7-16-58	...	Sand	.....	
23bca	Arnold Rieniets	100+	3	Dr	1920	10	7-16-58	D,S	Sand	.....	
23ccb	T. W. Delf	303	..	Dr	1940	Flow	7-16-58	D,S	Sand	.....	Flows 2 gpm
24bdd	E. L. Andre	280	..	Dr	1918	Flow	7-22-58	D,S	Sand	.....	
26dda	L. Offult	70	2	Dr	....	20	7-16-58	D	Sand	.....	
28bcc	Henry F. Richtsmeier	24	36	Du	1951	15	7-16-58	D,S	Sand and clay	.....	
30baa1	Peter Paulson	30	36	Du	1940	10	7-16-58	D,S	Gravel	.....	
30baa2	do.	34	36	Du	1920	..	.....	...	....	.....	C, inadequate supply
31baa1	Herb Halverson	16.41	24	B	....	14.32	7-16-58	D	Sand	.....	Inadequate supply
31baa2	do.	15.93	48	Du	....	11.92	7-16-58	S	Sand	.....	
32aba	.....	18.34	30	B	....	10.15	7-16-58	N	Sand	.....	
33bdc	Eldon Saunders	22.45	30	B	1952	12.13	7-16-58	D,S	Sand	.....	
34dcc	Paul Brayton	21	24	B	1951	9	.....	D,S	Gravel	.....	
36ddc	Robert Kennedy	198	3	Dr	1950	Flow	7-15-58	D,S	Sand	.....	Flows 2.5 gpm
144-53											
1ccc	Test hole 212	32	4	Dr	1960	..	.....	T	....	1,042	L
2bbc	Peter Sand	22.90	48	Du	....	17.10	7-17-58	D,S	Sand and gravel	.....	
2dab	John Lommrud	41.68	24	B	....	7.77	7-17-58	N	Gravel	.....	
3cbc	J. Jensen	16.72	48	Du	....	13.14	7-17-58	D,S	Sand	.....	
4aaa	Thomas Rud	13.45	48	Du	....	5.32	7-17-58	D,S	Sand	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date completed	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
144-53, Cont.											
4bcc	Test hole 2370	336	5	Dr	1965	..	.....	T	....	1,075	L
4ccc	Melvin Kyllo	32	36	Du	....	17	7-17-58	D,S	Sand	.....	
5bbc	Fred Brandsted	29.91	24	B	....	12.41	7-17-58	S	Gravel	.....	
5ddd	Test hole 210	17	4	Dr	1960	..	.....	T	....	1,074	L
6aad	Fred Brandsted	60	24	B	....	46	7-17-58	D,S	Gravel	.....	
6bad	R. Syverson	25.21	48	Du	....	9.33	7-17-58	S	....	.....	
6daa	Ole Aarhus	16.93	36	B	....	8.17	7-17-58	D,S	Sand	.....	
7dcd	H. Satrom	55.71	3	Dr	....	28.61	7-22-58	D,S	Sand	.....	
8aaa	Carry Moe	22.36	48	Du	1932	12.72	7-22-58	D,S	Gravel	.....	
8bbd	Ted Olstad	18.78	36	Du	....	12.42	7-17-58	D,S	Gravel	.....	
9cdc1	Otto B. Satrom	18	36	Du	1932	2	7-22-58	S	Sand	.....	
9cdc2	do.	28	36	Du	1952	6	7-22-58	D	Sand	.....	Inadequate supply
10ad	Henry Julseth	25.56	36	Du	....	19.79	7-17-58	D,S	Sand	.....	
10bbb	Test hole 211	32	4	Dr	1960	7.70	6-29-60	T	....	1,048	L
11ddc1	Test hole 177	12	4	Dr	1960	..	.....	T	....	1,054	L
11ddc2	Test hole 176	42	4	Dr	1960	34.5	6- 8-60	T	....	1,057	L
12baa	Harvey Erickson	27.15	36	Du	....	23.45	7-17-58	D,S	Sand	.....	Inadequate supply
12ccd	Test hole 175	27	4	Dr	1960	12	6- 8-60	T	....	1,050	L
12cdd	Test hole 174	42	4	Dr	1960	11.3	6- 7-60	T	....	1,041	L
12ddd	Arden Bring	22.87	48	Du	1932	12.48	7-16-58	D,S	Gravel	.....	
13aab	Test hole 173	17	4	Dr	1960	11.2	6- 7-60	T	....	1,040	L
13cbb	Dale Moen	60	24	B	....	45	7-17-58	D,S	Sand	.....	Inadequate supply
14acb	Martin Vos	90	48	B	....	12	7-17-58	D,S	Sand	.....	Inadequate supply
14bac	Oral Halvorson	29	30	B	1957	12	7-17-58	D,S	Sand	.....	
14cd	Howard Bring	168	3	Dr	....	20	7-17-58	D,S	Sand	.....	
15ccc1	Test hole 169	75	4	Dr	1960	..	.....	T	....	1,048	L
15ccc2	Ervin Richter	14.21	..	..	....	9.51	7-22-58	D,S	Sand	.....	
15ccc3	do.	Spring	..	..	....	Flow	7-22-58	...	Sand	.....	Flows 0.5 gpm

16ccc	Test hole 166	27	4	Dr	1960	..	.....	T	....	1,060	L
16dcc	Test hole 170	37	4	Dr	1960	..	.....	T	....	1,059	L
17ccd	Test hole 165	22	4	Dr	1960	6.4	6-6-60	T	....	1,087	L
17dcb	Otto Dahle	30.78	..	..	....	20.13	7-22-58	D,S,PS	Sand	.....	
18abal	Osmund Satrom	30	36	Du	1952	18	7-22-58	S	Sand and gravel	.....	Inadequate supply
18aba2	do.	62	3	Dr	1956	30	7-22-58	D	Sand and gravel	.....	
18ddc	Test hole 164	87	4	Dr	1960	..	.....	T	....	1,110	L
20abd	H. L. Henry	25.78	48	Du	....	6.93	7-22-58	D,S	Gravel	.....	
20baa	Lloyd Erickson	23.79	24	B	1952	11.99	7-22-58	D,S	Sand	.....	
20cdc	Clarence Jones	32.78	24	B	....	13.15	7-22-58	S	Sand	.....	
21ccb	Galesburg Village	60	18	Dr	1961	4	9-30-65	PS	Sand	.....	C
21cc	.....	55.71	36	B	....	47.38	7-22-58	D	Sand	.....	
21ccd	Test hole 167	47	4	Dr	1960	..	.....	T	....	1,065	L
22adc	A. Hull	28.74	30	B	....	15.76	7-17-58	D,S	Sand	.....	
22cbb	Test hole 168	27	4	Dr	1960	..	.....	T	....	1,049	L
23ccc	Test hole 214	27	4	Dr	1960	16.7	6-29-60	T	....	1,031	L
23ddc	Test hole 216	87	4	Dr	1960	16.7	6-29-60	T	....	1,059	L
23ddd	Test hole 215	42	4	Dr	1960	..	.....	T	....	1,056	L
24cbd	Ralph J. Bring	22.73	48	Du	....	12.57	7-22-58	D,S	Gravel	.....	
25dbd	Betsey Wiseth	14.78	..	Du	....	11.50	7-22-58	D,S	Sand	.....	
2[illegible]ab	Arden Bring	34	48	Du	1949	10	7-16-58	D,S	Sand	.....	
2[illegible]add	J. Lerfald	22.78	36	B	....	9.71	7-22-58	S	Sand	.....	SC 840
27bcb	Albert Norby	52	24	B	1947	13	7-22-58	D,S	Sand and gravel	.....	
28bba	H. Satrom	41.30	18	B	....	35.70	7-22-58	D	Sand	.....	
28bbb	Orville Paulson	46	15	B	1958	40	7-22-58	D	Sand	.....	SC 1,280
28ddd	Test hole 2369	325.5	5	Dr	1965	..	.....	T	....	1,060	L
30aaa	Melvin Olstad	40	..	B	1944	20	7-22-58	D,S	Sand	.....	SC 1,100
31aab	Chris Ulland	27.82	48	Du	....	13.31	7-22-58	S	Sand	.....	
31bad	Hartman Ulland	34.48	24	B	1953	15.72	7-22-58	D,S	Sand	.....	
32cdd	Albert Elliott	24.83	..	Du	....	9.72	7-22-58	S	Sand	.....	
32dad	Rust Bros.	98	2	Dr	1925	16	7-22-58	D	Sand	.....	
33aba	Orville Hoehgraber	27.94	30	B	....	15.74	7-22-58	D,S	Sand	.....	Inadequate supply
34ede	Orville Paulsen	35	4	Dr	1950	15	7-22-58	D,S	Sand	.....	
35abb	Orville Severs	17.92	..	..	....	13.83	7-22-58	D,S	Gravel	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date completed	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
145-49											
1bac	Mrs. Esther Kosojed	145	4	Dr	1913	6	6-27-58	D,S	Sand	.....	
1bcb	Earl G. Oien	150	2	Dr	....	5	6-26-58	D,S	....	.....	
1dcc	Clarence A. Rognlie	160	4	Dr	....	17	6-27-58	N	Sand	.....	
2ccc	Eugene Boeddeker	180	2	Dr	1945	6	6-26-58	D,S	Sand	.....	
4aad	A. Kjos	200	2	Dr	....	20	7- 1-58	D,S	Sand	.....	
4ccc	Alvin Bertch	160	2	Dr	....	..	.....	...	....	.....	SC 2,640
6aba	Mary T. Beitz	306	3	Dr	1951	15	7- 1-58	D	Sand and gravel	.....	
6baa	George Ackerman	300	2	Dr	1946	15	7- 1-58	S	Sand	.....	
8add	J. Swanston	174	3	Dr	....	14	7- 7-58	D,S	Sand	.....	Inadequate supply
9cbb	Harry Tonn	180	2	Dr	....	6	6-27-58	D,S	Sand	.....	
10bcc	R. Kaldor	180	2	Dr	1947	8	6-27-58	D,S	Sand	.....	
11ddd	Herberg School	180+	4	Dr	....	16	6-27-58	D	Sand	.....	
12acd1	Clarence A. Rognlie	133	4	Dr	1914	10	6-27-58	N	Sand	.....	
12acd2	do.	163	3	Dr	1955	7	6-27-58	D,S	Sand and gravel	.....	
12ccd	Christ Hettervig	202	4	Dr	1949	6	6-27-58	D,S	Gravel	.....	SC 2,370
13bdc	Cora Stenerson	177	2	Dr	1964	10	10- 1-65	D,S	Gravel	.....	C
15abc	Alton Anderson	238	2	Dr	1954	8	7- 8-58	S	Sand	.....	
18ada	Laurence Beitz	170	2	Dr	1954	..	.....	D	....	.....	
18baa	Henry A. Hettervig	175	..	Dr	....	8	6-26-58	D,S	Sand	.....	
19add	John Beach	173	3	Dr	1957	14	6-26-58	D,S	Sand	.....	
20daa	Earl S. Warner	340	3	Dr	....	11	7- 1-58	D,S	Sand	.....	C
21cbb	Test hole 2375	315	5	Dr	1965	..	.....	T	....	882	L
21ddc	D. Viker	222	2	Dr	....	20	6-26-58	D,S	Sand	.....	
22cdd	Harold Hage	268	2	Dr	....	30	6-26-58	D,S	Sand	.....	
23aaa	Harold Forseth	168.5	2	Dr	1942	10	7- 1-58	D,S	Sand	.....	
23ddd	Frank Hemberger	150	3	Dr	....	8	6-27-58	D	Gravel	.....	
28aab	D. Viker	224	2	Dr	....	18	6-26-58	D,S	Sand	.....	
29ad1	Halger Lindgren	280	2	Dr	....	11	7- 1-58	S	Sand	.....	SC 4,500
29ad2	do.	280	3	Dr	1957	11	7- 1-58	D	Sand	.....	

31abc	J. S. Dalrymple	135	2	Dr	1946	1	7- 1-58	D,S	Gravel	.....	C
31cc	E. D. McNamee	180	2	Dr	1944	1	7- 2-58	D,S	Sand	.....	
32add	G. Lindgren	196	3	Dr	1955	12	6-26-58	D,S	Gravel	.....	
33add	Leonard Ehrichs	180	3	Dr	1923	15	7- 2-58	D,S	Sand	.....	
36aab	D. E. Viker	160	..	Dr	1956	14	7- 7-58	D	Sand	.....	
36ddc	Jim Paulsrud	300	3	Dr	....	10	7- 7-58	D,S	Sand	.....	
145-50											
3aa	Art Mergenthal	160	2	Dr	1930	3	7- 1-58	D,S	Sand	.....	
3bc	Harold Meyer	180	2	Dr	1930	4	7- 1-58	D,S	Sand	.....	
3ccd	Mrs. E. Sundberg	225	2	Dr	....	Flow	7- 7-58	D	Sand	.....	
4cbb	Fred Downs	290	3	Dr	....	Flow	7- 2-58	D,S	Sand	.....	
5aad	Carl F. Meyer	180	2	Dr	....	5	7- 1-58	N	Sand	.....	
5abb	Test hole 1194	178	5	Dr	1957	..	.....	T	....	892	LHi
5abc	Test hole 1195	202	5	Dr	1957	..	.....	T	....	881	LHi
6bac	Abel Svobodny	254	2	Dr	....	Flow	7- 7-58	S	Sand	.....	CHi, flows 0.7 gpm
6bad	M. Hewitt	500	2	Dr	....	..	.....	N	Sand	.....	Flowed prior to "cave in."
6bcd	Test hole 1199	105	5	Dr	1957	..	.....	T	....	912	LHi
6daa	Earl Henn	200	2	Dr	....	8	6- 7-58	S	Sand	.....	
7cbb	L. Muller	394	2	Dr	1954	Flow	7- 7-58	S	Sand	.....	
7daa	Fred Schafer	397	3	Dr	....	Flow	7- 3-58	S	Sand	.....	Flows 2 gpm
8da	Ralph Diehl	165	3	Dr	1934	10	7- 2-58	S	Sand	.....	
9ab	do.	200	3	Dr	....	20	7- 1-58	D,S	Sand	.....	
9cbb	Harry Tonn	247	3	Dr	....	13	7- 2-58	S	Gravel	.....	
10daa	N. Buringrud	80	2	Dr	....	5	7- 1-58	S	....	.....	
11aac	Mrs. Albert Engel	430	3	Dr	....	2	7- 1-58	D	Sand	.....	
11cbb	do.	300	2	Dr	1916	2	7- 1-58	D,S	....	.....	
12aaa	Charles Henka	320	3	Dr	1947	Flow	7- 1-58	D,S	Sand	.....	
12bbc	W. Mergenthal	160	3	Dr	1938	6	6-26-58	N	....	.....	
14bbb	Leo Mooney	162	3	Dr	1957	4	7- 1-58	D,S	Sand	.....	
15aab	Paul Rotvold	162	3	Dr	1940	5	7- 1-58	D,S	Sand	.....	
15cbb	Andrew Helgo	375	..	Dr	1927	10	7- 1-58	N	Clay	.....	Inadequate supply
15dcc	Conrad Elton	160	..	Dr	1935	10	7- 1-58	D,S	Sand	.....	
16bb	Elroy Schultz	486	2	Dr	1915	Flow	7- 7-58	S	Sand	.....	Flows 1 gpm
17bcc	L. Mueller	400	2	Dr	....	10	7- 2-58	D,S	Sand	.....	
18aa	Grover Forster	185	2	Dr	1954	Flow	7- 1-58	D,S	Gravel	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date completed	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
145-50, Cont.											
18cbc1	Harold A. Smith	30	..	Du	....	29	7- 7-58	D	Sand	.....	SC 1,080
18cbc2	do.	297	3	Dr	....	..	.....	S	Gravel	.....	SC 4,500
19ccc	Test hole 1257	177	5	Dr	1957	....	.....	T	....	928	LHi
20aba	Ida Halvorson	...	2	Dr	....	Flow	7- 2-58	N	....	.....	Flows 3 gpm
20bbb	John Dalrymple	178	3	Dr	1950	20	7- 2-58	D,S	Sand	.....	
21dad	Test hole 219	32	4	Dr	1960	..	.....	T	....	896	L
21dd	Dan Downs	20	36	Du	....	15	7- 1-58	D,S	....	.....	
22da	K. Diehl	174	..	Dr	1948	21	7- 1-58	D,S	Gravel	.....	
22daa	Test hole 220	72	4	Dr	1960	32	.....	T	....	892	L
23caa	Mrs. Carrie Nelson	300	2	Dr	1936	3	7- 2-58	S	Sand	.....	
24aad	Test hole 196	27	4	Dr	1960	..	.....	T	....	874	L
24ada	Test hole 195	52	4	Dr	1960	..	.....	T	....	878	L
24add	Test hole 197	42	4	Dr	1960	..	.....	T	....	876	L
24bbc	Norman Brunsdale	17	24	Du	....	10.46	10- 5-65	D	Sand and clay	.....	C, W
24bcb	do.	16	36	Du	....	9.28	7- 2-58	S	Clay	.....	C
25ccd	Carrie Nelson	285	2	Dr	....	4	7- 7-58	S	Sand	.....	
26bac	Otto Bertsch	200	3	Dr	....	10	7- 1-58	D,S	Sand	.....	
26ccc	A. E. Lorch	241	2	Dr	1956	Flow	7- 2-58	D,S	Sand	.....	Flows 480 gpd
27bbb	R. F. Meyer	225	3	Dr	1928	4	7- 1-58	D,S	Sand	.....	
28bcc	Henry E. Meyer	172	..	Dr	1943	12	7- 3-58	S	Sand	.....	
28cbb	Ingrum Lovas	...	3	Dr	....	10	7- 2-58	D,S	Sand	.....	Inadequate supply
30ccc	Walter Schultz	80	3	Dr	1948	24	7- 1-58	D,S	Gravel	.....	SC 900
30cdc	Test hole 191	87	4	Dr	1960	..	.....	T	....	923	L
31cab	Daniel P. Rosted	70	6	Dr	....	..	.....	D,S	Sand	.....	
31cdd	Test hole 2374	336	5	Dr	1965	..	.....	T	....	920	L
32acb	Mrs. Mark Chatfield	160	1½	Dr	....	1	7- 3-58	D,S	Sand	.....	
32ccc	Test hole 2381	273	5	Dr	1965	..	....	T	....	912	L
34ccd	Bernard Beach	204	3	Dr	1952	20	1952	S	Sand	.....	
35ccb	J. S. Dalrymple	147	3	Dr	....	12	7- 1-58	S	Sand	.....	
36dcc	do.	165	3	Dr	1927	Flow	7- 7-58	D,S	....	.....	SC 5,000

145-51											
labs	.....	Spring	..	..	....	..	10-25-65	N	....	.....	C, flows 1 gpm
labb	Test hole 1198	115	5	Dr	1957	..	.....	T	....	895	LHi
ladc1	Hillsboro city well	94	120	Du,Dv	....	46.10	10-11-65	O	Sand	935	CHi, W
ladc2	Hillsboro city well No. 1	115	12	Dr	1947	49.19	10-25-65	PS	Sand	935	
ladc3	Hillsboro city well No. 3	115	12	Dr	1965	42.28	10-26-65	PS	Sand	930	C
ldaa	S. H. Boeddeker	100	4	Dr	....	35	7- 3-58	D,S	Sand	.....	
ldab	Hillsboro city well No. 2	115	12	Dr	1955	..	.....	PS	Sand	935	CHi, C
ldda	Test hole 1261	94	5	Dr	1957	..	.....	T	....	925	LHi
lddb	Test hole 1196	139	5	Dr	1957	..	.....	T	....	939	LHi
lddc	Observation well	93	1¼	Dr	1965	41.32	11-30-65	O	Sand	930	C, W, L, test hole 2379.
2cdc	Bill Kozojed	120	2	Dr	....	1	7-16-58	D,S	....	.....	
2dcd	Leonard Kritzberger	385	2	Dr	1952	Flow	7-15-58	D,S	Sand	.....	
3cdc	M. Larson	65	3	Dr	1910	55	7-16-58	D,S	Sand	.....	
4adc	K. Nelson	371	3	Dr	1951	Flow	7-15-58	D,S	Sand	.....	
4bcc	Alex Jacobson	140	..	Dr	1956	Flow	7-15-58	D,S	Sand	.....	
5aad	Mrs. Roy Pederson	270+	2½	Dr	1907	Flow	7-15-58	S	Sand	.....	
5bbb	Nettie Ellingrud	315	3	Dr	1915	1	7-15-58	N	Sand	.....	Presently plugged
5bcd	Andrew Christianson	...	3	Dr	1923	Flow	7-15-58	S	Sand	.....	
5dcc	Carl Nelson	...	3	Dr	....	Flow	7-15-58	S	Sand	.....	
6ada	Bertha Ellingrud	350+	3	Dr	1890	Flow	7-15-58	D,S	Sand	.....	
6bbd	Ben Berkas	351	2	Dr	1944	Flow	7-15-58	S	Sand	.....	C, flows 2 gpm
8abb	J. Klementson	345	2	Dr	1941	Flow	7-15-58	D,S	Sand	.....	Flows 60 gpm, cut down to 40 gpm.
8baa	Iver Rud	353	4	Dr	1953	Flow	7-15-58	S	Sand	.....	
8da	Ole Klemetson	360	2	Dr	....	..	.....	N	Sand	.....	Presently plugged
9cd	Henry Schlichtman	320	2	Dr	....	Flow	7-15-58	S	Sand	.....	
10aaa	Morris Larson	120	1½	Dr	1897	5	7-16-58	S	Sand	.....	
11dad	Sundby Bros.	560	..	Dr	1917	12	7-16-58	S	Sand	.....	
12aaa	Test hole 1197	157	5	Dr	1957	..	.....	T	....	934	LHi
12aab	Ralph Mueller	60	1¼	Dv	....	..	.....	D,S	....	.....	
13aaa1	Alvin Muller	74	3	Dr	....	25	7- 7-58	D,S	Sand	.....	SC 1,620
13aaa2	do.	...	2	Dr	....	20	7- 7-58	D,S	Sand	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date completed	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
145-51, Cont.											
13aaa3	Test hole 1255	178.5	5	Dr	1957	..	.....	T	....	933	LH1
13ba	A. Muller	46.1	3	Dr	....	1.4	8-22-38	D	....	.....	
14aad	Brian Brenden	400	3	Dr	....	Flow	.....	N	Sand	.....	Presently plugged
14daa	Jake C. Grable	400+	3	Dr	....	Flow	.....	S	Sand	.....	Presently plugged
15ccc	Mellius Manger	265	3	Dr	1901	1	.....	N	Sand	.....	Presently plugged
16cbb1	Arnold Wilson	150	2	Dr	1952	Flow	10- 5-65	D,S	Sand	.....	C, flows 1 gpm
16cbb2	do.	150	3	Dr	....	Flow	.....	S	Sand	.....	
16dda	Joe Berkas	278	3	Dr	1918	Flow	7-15-58	S	Sand	.....	
17bcc	Oliver Krogh	350+	..	Dr	1950	Flow	7-15-58	D,S	Sand	.....	
18aca	Lloyd Arnegard	380	..	Dr	1928	Flow	7-15-58	D,S	Sand	.....	
18bda	K. Oien	...	3	Dr	....	Flow	7-15-58	N	Sand	.....	
18daa	Milton Anderson	298	2	Dr	1943	Flow	7-15-58	D	Sand	.....	
19ccc	Claus Beckman	300	2	Dr	1928	Flow	7-15-58	D,S	Sand	.....	
22cad	Howard Larson	285	3	Dr	1949	Flow	7-15-58	S	Sand	.....	
24aaa1	Kenneth A. Halvorson	75	3	Dr	1920	33	7- 3-58	S	Sand	.....	
24aaa2	Test hole 1256	178	5	Dr	1957	..	.....	T	....	930	LH1
24ccb	Walter Thompson	420	2	Dr	1951	Flow	.....	S	Sand	.....	CH1, granite report at bottom.
24ddd	Clarence Hagen	75	3	Dr	1950	30	7-16-58	D,S	Sand	.....	SC 640
25aaa	B. A. Waters	80	4	Dr	1943	20	7-16-58	S	Sand	.....	
25abb	Test hole 190	27	4	Dr	1960	..	.....	T	....	922	L
25bbb	Test hole 189	22	4	Dr	1960	..	.....	T	....	937	L
26acb	Ole Engerbretson	...	3	Dr	....	Flow	7-16-58	N	Sand	.....	
26cdc	Ole Overbee	450	3	Dr	1892	Flow	7-15-58	S	Sand	.....	
26dcb	Mrs. Ruth Wilson	420	3	Dr	1945	Flow	7-15-58	S	Sand	.....	
29aaa	Art Bjerke	375	3	Dr	1937	Flow	7-15-58	S	Sand	.....	
29bbb	Mrs. Henry Volla	360	3	Dr	1954	Flow	7-15-58	D,S	Sand	.....	C
30ccd	Merton Sheldon	...	2	Dr	....	Flow	7-15-58	D,S	Sand	.....	
32bad	Pearl Larson	300	2	Dr	1952	Flow	7-15-58	D,S	Sand	.....	

32bcb	Mrs. Emil Lundeen	360	2	Dr	1940	Flow	7-16-58	D,S	Sand	.....	
34bba	Bernard Fleischer	...	3	Dr	....	Flow	7-16-58	S	Sand	.....	
35aal	C. M. Leraas	384	2½	Dr	1952	Flow	7-16-58	S	Sand	.....	Flows 3 gpm
35aa2	do.	16	30	Du	....	1	7-16-58	D	Sand	.....	
35cdd	E. Worley	300+	3	Dr	1948	Flow	7-16-58	D,S	Sand	.....	
35dda	Earl H. Larson	350+	2	Dr	....	Flow	7-16-58	S	Sand	.....	
36aaa	John Fortman	472	2	Dr	....	15	7- 2-58	N	Sand	.....	Presently plugged
36bba	E. G. Larson Estate	375	2	Dr	1914	Flow	7-16-58	S	Sand	.....	
36ccd	Test hole 188	87	4	Dr	1960	..	.....	T	....	930	L
36dcd	Test hole 187	17	4	Dr	1960	..	.....	T	....	937	L
145-52											
1ccc	Ira Garrett	420	2	Dr	1949	Flow	7-17-58	D,S	Sand	.....	Flows 2.5 gpm
5ccd	M. G. Gummer	450	2½	Dr	1951	Flow	7-17-58	S	Sand	.....	
6cb	Erling Vinje	400	..	Dr	....	Flow	7-17-58	S	Sand	.....	Flows 5 gpm
7ada	Oscar Lyng	116	3	Dr	1952	2	7-17-58	S	Sand	.....	
8ada	Wallace Melhus	360	3	Dr	1943	Flow	7-17-58	S	Sand	.....	Flows 2 gpm
8cbb	G. A. Langlie	150	3	Dr	1954	2	7-17-58	S	Sand	.....	
10ccc	William Rye	100	3	Dr	1948	1	7-17-58	S	Sand	.....	SC 2,230
11cad	John Dalrymple	332	2½	Dr	1948	Flow	7-17-58	D,S	Sand	.....	
12cbc	do.	270	2	Dr	1938	Flow	.....	...	....	.....	
12ddd	W. Schlichtman	145	..	Dr	1933	Flow	.....	...	....	.....	
13bba	Sivert Stene	379	2	Dr	....	Flow	7-17-58	S	Sand	.....	
14bab	Kay E. Brunsdale	350	2	Dr	....	Flow	7-17-58	S	Sand	.....	Flows 1.5 gpm
17bcc	Arndt Aarsvold	300+	2	Dr	....	Flow	7-16-58	N	Sand	.....	
18add	Robert Walker	312	1½	Dr	....	Flow	7-16-58	S	Sand	.....	
18cdc	E. H. Gorder	408	3	Dr	1937	Flow	8-27-37	D,S	Sand	.....	LL
19aba	Gerhard Knudsvig	400	2	Dr	1937	Flow	8- 6-37	D,S	Sand	.....	LL
19adc1	Duane Lyng	420	3	Dr	1958	Flow	7-16-58	S	Sand	.....	
19adc2	do.	32	36	Du	....	..	.....	D,S	Sand	.....	Inadequate supply
19bcb	Cliffton Arneson	438	4	Dr	1936	Flow	7-16-58	D,S	Sand	.....	
19ddd1	Calmer Knudson	70	16	Dr	....	18	7-17-58	S	Sand and gravel	.....	
19ddd2	do.	400	2½	Dr	1931	Flow	7-17-58	S	Sand	.....	Flows 120 gpd
20cbc1	Karl Aasen	400+	...	Dr	1937	Flow	7-16-58	D,S	Sand	.....	LL
20cbc2	Test hole 184	27	4	Dr	1960	..	.....	T	....	987	L
20ddc	Joe Domier	400	3	Dr	1928	4	7-16-58	S	Sand	.....	
21aaa	Frank Brasel	330	2½	Dr	1947	Flow	7-17-58	S	Sand	.....	Flows 8 gpm
22ddd	Cortland Hanson	...	2	Dr	1927	Flow	7-17-58	S	Sand	.....	
24bc	Herman Grothmann	406	1	Dr	....	Flow	7-17-58	D,S	Sand	.....	Flows 3 gpm

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
145-52, Cont.											
24ccd	Hazel E. Wallace	410	2½	Dr	1949	Flow	7-16-58	S	Sand	.....	
25bab	Henry A. Grothmann	340	2½	Dr	1940	Flow	7-16-58	D,S	Sand	.....	
25bc	Chester Burley	400	2	Dr	1936	Flow	7-16-58	D,S	Sand	.....	
25dcb	E. Andre	300	..	Dr	1918	..	.....	N	Sand	.....	Presently plugged
27bbbl	John Lovas	350	3	Dr	1948	Flow	7-22-58	S	Sand	.....	
27bbb2	do.	120	1½	Dr	....	8	7-22-58	D	Sand	.....	C
28aaa	Test hole 185	37	4	Dr	1960	..	.....	T	....	964	L
28aad	Mrs. Floy Brown	400+	..	Dr	....	Flow	7-16-58	D,S	Sand	.....	
29bba	Test hole 186	12	4	Dr	1960	..	.....	T	....	992	L
29cbc	Henry Thronson	400	..	Dr	1943	Flow	7-16-58	D,S	Sand	.....	Flows 4 gpm
30bad	E. G. Christopherson	400	..	Dr	1941	Flow	7-16-58	D,S	Sand	.....	
30ddb	Martin Larson	333	2	Dr	1940	Flow	7-17-58	D,S	Sand	.....	Flows 10 gpm
31aaa	Elvin B. Olson	465	2	Dr	1936	Flow	7-16-58	S	Sand	.....	Flows 1 gpm
31bbb	Morris Rindy	438	2	Dr	....	Flow	7-22-58	S	Sand	.....	
32cba	N. Olson	365	2	Dr	1939	Flow	7-16-58	S	Sand	.....	Flows 3 gpm
33aaa	Chester Thompson	...	..	Dr	....	2	7-15-58	S	Sand	.....	
33bcb	Bertha Ege	400+	2	Dr	....	2	7-17-58	D,S	Sand	.....	
36daa	Harry Reinan	315	1¼	Dr	....	Flow	.....	D,S	Sand	.....	Presently plugged
145-53											
2aad	Tennis Skatberg	415	3	Dr	1914	Flow	7-22-58	S	Sand	.....	C
2bbc	Elmer Reynolds	25	24	B	....	10	7-22-58	D,S	Sand	.....	
2cbbl	Clarence Anderson	26	36	B	1923	10	7-22-58	S	Sand	.....	
2cbb2	do.	27	36	B	1928	10	7-22-58	S	Sand	.....	
2cbb3	do.	28	36	B	1932	9	7-22-58	S	....	.....	
2cbb4	do.	28	21	B	1932	11	7-22-58	D	Sand	.....	
3ccc	Test hole 152	37	4	Dr	1960	..	.....	T	....	1,039	L
3ddd	Test hole 156	27	4	Dr	1960	23.5	6- 1-60	T	....	1,019	L
4ccd	Test hole 149	37	4	Dr	1960	10.0	5-31-60	T	....	1,102	L
4cddl	Conrad Rygg	18.56	48	Du	1957	14.13	7-22-58	D,S	Sand	.....	

4cdd2	Test hole 150	87	4	Dr	1960	15.0	5-31-60	T	....	1,083	L
4ddc	Test hole 151	37	4	Dr	1960	11.0	5-31-60	T	....	1,048	L
6bc	Telferd Kaasa	12	36	Du	1951	6	7-22-58	D	Sand	.....	
6dda	Ed Haugan	16	48	Du	1935	5	7-22-58	D,S	Gravel	.....	
7add	Ole Thompson	22	36	B	1936	3	7-22-58	D,S	....	.....	
7bcd	Charlie Thompson	12	36	B	....	4	7-22-58	D,S	....	.....	
8aad	Harvey Kyllo	20	60	Du	1948	8	7-22-58	D,S	Sand	.....	C
8abb	Test hole 148	37	4	Dr	1960	10.0	5-31-60	T	....	1,106	L
8ddd	Leon D. Thompson	30	48	Du	....	..	.....	D,S	Sand	.....	Inadequate supply
9ddd	Arthur Rygg	538	3	Dr	1943	20	7-22-58	D,S	Sand	.....	
10cccl	Albert H. Newman	165	3	Dr	1956	Flow	7-22-58	S	Sand	.....	C, inadequate supply
10ccc2	do.	13	18	B	....	.50	7-22-58	D	Sand	.....	
11aaa	Test hole 154	22	4	Dr	1960	..	.....	T	....	993	L
11bbb	B. J. Knudson	27	30	B	1948	6	7-22-58	D	Sand	.....	
12abb	Test hole 153	65	4	Dr	1960	29.5	6- 1-60	T	....	995	L
14acbl	B. J. Knudson	2?.40	48	Du	1897	18.83	7-22-58	D	Gravel	.....	
14acb2	do.	29.83	36	Du	1897	16.83	7-22-58	S	Gravel	.....	
14bab	Test hole 155	27	4	Dr	1960	21.7	6- 2-60	T	....	1,020	L
16baa	Test hole 2371	525	5	Dr	1965	..	.....	T	....	1,060	L
16cbc	Melvel Domeir	16	..	Du	1958	10	7-22-58	D,S	....	.....	
18cab	Ed Solberg	18	36	Du	1928	14	7-22-58	D,S	Sand	.....	
19dda	Paul Satrom	19.15	48	Du	....	17.65	7-22-58	D,S	Sand	.....	
21ccc	Test hole 158	21	4	Dr	1960	..	.....	D,S	Sand	1,095	L
21cd	Clifford Ambrosen	10.90	..	Du	....	6.46	7-22-58	D,S	Sand	.....	
21ddc	Test hole 160	22	4	Dr	1960	..	.....	T	....	1,062	L
22cc	R. Reed	8.83	48	Du	....	2.26	7-23-58	S	Sand	.....	
23aaa	George Odegaard	400+	3	Dr	1937	Flow	7-22-58	D,S	Sand	.....	LL
23dc	Paul M. Craig	480	3	Dr	1938	Flow	7-22-58	D,S	Sand	.....	C, flows 3 gpm
25ddd	Alfred Sundeen	425	3	Dr	1937	Flow	7-22-58	S	Sand	.....	LL
26ada	Hilmer Moen	25.20	48	B	1956	19.76	7-22-58	D,S	Sand	.....	
26bba	Test hole 163	42	4	Dr	1960	9.1	6- 3-60	T	....	1,011	L
26ccd	John Ness	14.71	48	Du	....	12.40	7-23-58	D,S	Sand	.....	
27aaa	Test hole 162	37	4	Dr	1960	16.0	6- 3-60	T	....	1,038	L
27abb	Test hole 161	22	4	Dr	1960	19.0	6- 3-60	T	....	1,035	L
27ada	Bertel Nelson	520	3	Dr	1957	12	7-22-58	S	Sand	.....	C
27daa	Herbert Bennett	35	30	B	1956	10	7-22-58	D,S	Gravel	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
145-53, Cont.											
28abb	Test hole 159	87	4	Dr	1960	6.4	6- 3-60	T	....	1,078	L
28adb	Clifford city well	28	30	B	1955	3	7-22-58	PS,O	Sand	.....	W
28bcd	Bennett Erickson	50	24	B	....	16	7-23-58	D	Sand	.....	
28caal	William Thompson	15	..	B	....	..	.....	D	Sand	.....	
28caa2	do.	16.0	..	B	....	1.11	7-23-58	S	Sand	.....	
29bba	Test hole 157	47	4	Dr	1960	36.7	6- 3-60	T	....	1,113	L
30ccc1	Test hole 223	27	4	Dr	1961	..	.....	T	....	.....	L
30ccc2	Test hole 224	27	4	Dr	1961	..	.....	T	....	.....	L
30ccd	Wayne and Merlin Volla	37	24	B	1949	22	7-22-58	D,S	Sand	.....	
30dcc	Ralph Elliott	70	24	B	....	20	7-22-58	D,S	....	.....	
31ddd	Ivor Bakken	32	48	Du	1948	..	.....	D	....	.....	
33bbb	W. Thompson	40	..	..	1919	6	7-22-58	D	Sand	.....	
34cdc1	Bert Burkholder	14.4	48	Du	....	8.6	7-22-58	D	Sand	.....	
34cdc2	do.	90	60	Du	....	8.8	7-22-58	S	Sand	.....	
34ddd	Harold Stockmoe	16.14	..	Du	....	4.8	7-22-58	D,S	....	.....	
35aca1	Arthur Martin	18	36	Du	....	10	7-22-58	S	....	.....	
35aca2	do.	25	24	Du	1955	13	7-22-58	D	....	.....	
146-49											
1bbb	V. Morehart	160	..	Dr	1944	Flow	6-26-58	...	Sand	.....	
1ccc	L. Koppang	144	2	Dr	1951	6	6-26-58	D,S	Sand	.....	
2abd	Alvin Foss	168	2	Dr	....	6	6-26-58	D,S	Sand	.....	
2ddb1	Good Samaritan Home	170	3	Dr	....	..	.....	D	....	.....	
2ddb2	do.	75	3	Dr	....	..	.....	S	Sand	.....	
3cbb	Bernard Wright	170	2	Dr	....	7	6-27-58	D,S	Sand	.....	
3daa	Russell Wright	150+	2	Dr	1916	4	6-27-58	D,S	Sand	....	
4add	Mrs. Ida Provance	170	2	Dr	....	7	6-27-58	D,S	Sand	.....	
4bbb	Test hole 2378	273	5	Dr	1965	..	.....	T	....	872	L
4cdc	Erling Weng	83	3	Dr	1918	40	6-27-58	D	Sand	.....	C

)bcc	John Beltz	375	2	Dr	....	110	6-27-58	S	Sand	.....	
5cdd	Donald Wright	230	2	Dr	1941	15	6-27-58	D,S	Sand	.....	
5ddd	do.	230	2	Dr	....	15	6-27-58	D	Sand	.....	
6add	Karl Kuntz	350	4	Dr	....	30	7- 1-58	S	Sand	.....	
6bba	Wilbert Cotton	180	2	Dr	1883	25	7- 1-58	D,S	Sand	.....	
6dad	Willard McDonald	180	3	Dr	1938	20	6-27-58	D,S	Sand	.....	
6ddd	Esther Major	60	24	B	....	..	.....	D,S	Gravel	.....	
7bcc	W. Kuntz	325	3	Dr	1937	14	9-21-37	...	Sand	.....	LL
8bcc	Roy Miller	160	2	Dr	1937	..	.....	D,S	....	.....	
9abb	Arvid Nettum	160	4	Dr	1937	20	6-27-58	S	Sand	.....	
9bc	Julia Gunderson	125	..	Dr	....	..	.....	S	Sand	.....	
10bcc	Theodore Swalstad	180	4	Dr	....	17	6-27-58	S	Sand	.....	
11bca	Lucille Wright	168	2	Dr	....	6	6-26-58	D,S	....	.....	
11dba	Sigrud Paulsrud	175	..	Dr	1941	5	6-27-58	D,S	Sand	.....	
14bcc	Lyle Anderson	...	2	Dr	....	Flow	7- 8-58	S	Sand	.....	
15cab1	Charles Hatfield	160	2	Dr	1952	12	7- 8-58	D	Sand	.....	
15cab2	do.	160	2	Dr	....	12	7- 8-58	S	Sand	.....	
15cab3	do.	320	2	Dr	1942	Flow	7- 8-58	N	Sand	.....	
15cac	Arthur E. Chandler	156	4	Dr	1911	12	7- 8-58	D,S	Sand	.....	
18aaa	Otto Beltz	160	2	Dr	1941	16	7- 1-58	D,S	....	.....	
18cdc	William C. Jahnke	148	1½	Dr	....	30	7- 1-58	S	Sand	.....	
19bab	Herbert Jahnke	148	2	Dr	1938	..	.....	D,S	....	.....	
20aaa	Anne Norvick	130	2	Dr	1956	12	7- 7-58	D	Sand	.....	C
20cad	Jim Rutherford	155	3	Dr	....	20	7- 7-58	D,S	....	.....	
21abb1	Emma Haugen	...	1½	Dr	....	20	7- 7-58	D,S	Sand	.....	
21abb2	do.	175	..	Dr	....	1	7- 7-58	N	Sand	.....	
21cbc	Virgil Boeddeker	312	2	Dr	1951	11	7- 7-58	D,S	Sand	.....	
21dbc	Arthur Chandler	156	2	Dr	1933	15	7- 8-58	D,S	Sand	.....	
23dba	Jacobson Bros.	180	3	Dr	1950	Flow	7- 8-58	D,S	Sand	.....	
26baa	Ted Swalstad	200	3	Dr	....	10	7- 8-58	N	Sand	.....	
26dba	Alton Anderson	178	2	Dr	1943	4	7- 8-58	D,S	Sand	.....	
26dcd1	Art Anderson	168	2	Dr	1938	10	7- 8-58	D,S	Sand	.....	
26dcd2	do.	168	2	Dr	....	10	7- 8-58	D,S	Sand	.....	
29aad	C. W. Morgan	182	3	Dr	1918	20	7- 7-58	S	Sand	.....	
29acc	Bernard Boeddeker	186	2	Dr	....	20	7- 7-58	D,S	Sand	.....	Presently plugged
29bab	Julia Elliot	155	..	Dr	....	20	7- 7-58	N	....	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
146-49, Cont.											
30aad	Frendberg Estate	157	..	Dr	....	12	7- 7-58	D,S	....	.....	
30bdb1	Justin Bagstad	425	2	Dr	1932	20	7- 7-58	N	Sand	.....	
30bdb2	do.	30	48	Du	....	26	7- 7-58	S	Sand	.....	Inadequate supply
30cca	Joe Lusso	150	2	Dr	1938	..	.....	D,S	Sand	.....	
30dab	William Stanley	160	..	Dr	1952	20	7- 7-58	D,S	Sand	.....	
30dbb1	Art Grove	168	2	Dr	....	15	7- 7-58	D,S	Sand	.....	
30dbb2	do.	30	48	Du	....	8	7- 7-58	N	Sand	.....	
33cd	K. E. Brunsdale	175	..	Dr	....	10	7- 1-58	D,S	Sand	.....	
35bad	Joe A. Anderson	200	2	Dr	....	10	7- 8-58	D,S	....	.....	
35dba	Glen Lougheed	190	3	Dr	1949	4	7- 8-58	D,S	Sand	.....	
146-50											
1abb	Test hole 2538	296	5	Dr	1966	..	.....	T	....	878	L
1cd	Ragnar Weng	208	2	Dr	1941	35	6-30-58	D,S	....	.....	
2ad1	Joe Kuntz	155	3	Dr	1937	..	.....	N	Sand	.....	
2ad2	do.	207	3	Dr	1940	40	6-27-58	D,S	Sand	.....	
2bc	Oscar Asheim	228	2	Dr	1953	5	7- 1-58	S	Sand	.....	
2ccc	Lena Ydstie	200	2	Dr	1877	16	6-27-58	S	Sand	.....	
2dcc1	Orlin Ydstie	280	3	Dr	1937	..	.....	S	Sand	.....	
2dcc2	do.	220	3	Dr	1900	..	.....	N	Sand	.....	Presently plugged
4ccd	Ole H. Olson	165	3	Dr	....	65	7- 1-58	D,S	Sand	.....	
4ddd	H. Ydstie	163	2	Dr	1928	7	6-27-58	S	Sand	.....	
5bbb	Eddie Solee	420	2	Dr	1948	Flow	6-30-58	S	Sand	.....	C
5cca	Joe Pulskamp	...	2	Dr	1908	Flow	6-30-58	S	Sand	.....	
6cdc	Thomas Steenson	235	2	Dr	1944	Flow	7-10-58	S	Sand	.....	
6dcc	Test hole 221	12	4	Dr	1960	..	.....	T	....	914	L
6ddc	Grace Engle	...	..	Dr	....	Flow	7-10-58	D,S	Sand	.....	Sulfur odor
7ccc	Marie Oie	265+	2	Dr	....	Flow	7-10-58	S	Sand	.....	
8cab	Tobias Eidum	420	2	Dr	....	..	.....	N	Sand	.....	Presently plugged
8dcd	Marie Brenden	400	2	Dr	....	Flow	6-30-58	S	Sand	.....	

10abb	Clarence Thykeson	175	..	Dr	....	11	6-27-58	S	Sand	.....	
10ccc	Clara and George Jahr	168	3	Dr	....	4	7- 1-58	S	Sand	.....	
10ddd	Thomas Rogstad	185	4	Dr	....	Flow	7- 1-58	D,S	Sand	.....	C
12cdd	Mary Goshinska	170	2	Dr	....	10	7- 1-58	S	Sand	.....	
13baa	Edward Ebbighausen	250	2½	Dr	1923	25	7- 1-58	N	Sand	.....	
14acb	John Berg	190	2½	Dr	....	10	7- 1-58	D,S	Sand	.....	
14cbb	William Weber	208	3	Dr	1916	8	7- 1-58	S	Sand	.....	
14dbb	Lloyd H. Strom	218	2	Dr	1938	2	7- 1-58	S	Sand	.....	
15ad	Albert Rust	150	2	Dr	1948	5	7- 1-58	S	Gravel	.....	
15bbb	Henry Strom	146	3	Dr	....	12	7- 1-58	S	Sand	.....	
15ccb	Edwin Engel	182	3	Dr	1920	7	7- 1-58	S	Sand	.....	
17dcc	Ruby Chelson	479	2	Dr	1950	Flow	7- 1-58	S	Sand	.....	
19aaa	Elmer Anderson	...	..	Dr	....	Flow	7-10-58	N	Sand	.....	
20baa	Albert Olson Estate	290	2	Dr	....	Flow	7- 1-58	N	Sand	.....	
20cd	Arthur Klemetson	...	2	Dr	....	Flow	7- 1-58	N	Sand	.....	
21ccc	L. Muller	98	2	Dr	1955	10	6-27-60	S	Sand	.....	
22aad	Mrs. Sophia Beirman	160	2	Dr	....	7	7- 1-58	N	Sand	.....	
22ddb	Alice Peerson	180	2	Dr	....	7	7- 1-58	S	Sand	.....	
23dcd	Andrew Anderson	275	2	Dr	....	5	7- 1-58	S	Sand	.....	
24dcc	O. S. Tweeten	180	2½	Dr	....	..	.....	D	....	.....	
25bda	O. H. Siegert	398	2	Dr	1941	5	7- 7-58	S	Sand	.....	C
25ddb	Louis Lusso	150	2	Dr	....	..	.....	D,S	Sand	.....	
26cca	Willard Mergenthal	135	2½	Dr	....	4	7- 7-58	S	Sand	.....	
26dcd1	T. Anderson	33	48	Du	1918	29	7- 7-58	S	Sand	.....	
26dcd2	do.	145	2	Dr	1929	2.5	7- 7-58	N	Sand	.....	
27acd	John Mergenthal	215	2	Dr	1943	6	7- 7-58	S	Gravel	.....	
28ddb	Earl Mergenthal	186	2	Dr	1946	Flow	7- 7-58	S	Sand	.....	
30add	Darell Sorum	218	2	Dr	....	Flow	7-10-58	D,S	....	.....	
30bbb	Ervin Koering	418	..	Dr	1950	Flow	7-10-58	D,S	Sand	.....	SC 5,760
31dba	Hjelmstad Bros.	...	2	Dr	1908	Flow	7-10-58	S	Sand	.....	
32bad	Test hole 198	17	4	Dr	1960	..	.....	T	....	900	L
32cac	Morris Smith	...	..	Dr	....	3	7-10-58	N	....	.....	
32ccb	E. Iverson	...	2	Dr	1953	Flow	7-10-58	S	....	.....	
32dad	John Letnes	...	..	..	....	8	7-10-58	S	....	.....	
33abb	do.	470	2	Dr	....	1	7- 7-58	S	....	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
146-50, Cont.											
33ccc	W. Mooney	...	..	Dr	....	Flow	7- 8-58	S	Sand	.....	
33dcc	Harry Tonn	...	2	Dr	....	Flow	7- 8-50	S	Sand	.....	
34bba	Letnes Brothers	...	4	Dr	....	Flow	7- 7-58	N	Sand	.....	
35dba	Mrs. Alice Meyer	...	..	Dr	....	Flow	7- 8-58	S	Sand	.....	
36dcc	Frank Boeddeker	365	2	Dr	1934	12	7- 8-58	D,S	Sand	.....	
146-51											
1aaa	Pete Freeland	...	..	Dr	....	3	7-14-58	D,S	Sand	.....	
2aba	Selmer Waslin	79	3	Dr	1943	1	7-14-58	S	Sand	.....	
2bcc	Paul Steen	72	3	Dr	1946	..	.....	S	Sand	.....	
2ccd	James Solberg	74	3	Dr	1936	19	7-14-58	D,S	Sand	.....	
2dcc	Anton Sundby	65	3	Dr	....	6	7-14-58	S	Sand	.....	
3ddc	Test hole 1330	105	5	Dr	1958	....	.....	T	....	959	L
4aaa	Test hole 12	160	5	Dr	1948	..	.....	T	....	900	LP
4cbc	Henning Johnson	360	2	Dr	1890	Flow	7-14-58	S	Sand	.....	
6acal	Alvin Eastvold	...	3	Dr	1948	Flow	7-14-58	S	Sand	.....	
6aca2	do.	40	5	Dr	....	20	7-14-58	D,S	....	.....	
6aca3	do.	Spring	..	..	....	Flow	7-14-58	...	....	.....	
7bcd	Joe Wolden	160	2	Dr	....	Flow	7-14-58	S	Sand	.....	
7cdb	Christian Hanson	...	2	Dr	1953	Flow	7-14-58	S	Sand	.....	
8abc	Arvid Solberg	180	2	Dr	1934	10	7-14-58	S	Gravel	.....	
10bbb	James Solberg	325	3	Dr	1926	Flow	7-14-58	S	Sand	.....	
10ccd	I. Flengstad	325	2	Dr	1948	Flow	7-14-58	S	Sand	.....	
11adb	Gilbert Strand	90	4	Dr	1950	6	7-14-58	D,S	Sand	.....	C
11ccb	Lyn Nysveen	82	..	Dr	1953	10	7-14-58	D,S	....	.....	SC 720
12aac	Ralph Steenson	300+	2	Dr	....	Flow	7-14-58	S	Sand	.....	Presently plugged
12ccd	Julin Nelson	110	2	Dr	1944	20	7-14-58	D,S	Sand	.....	

12ddc	George Schmaltz	315	3	Dr	1938	Flow	7-14-58	S	Sand	.....	Flows 8.5 gpm
13cbb1	Nennor Nelson	90	4	Dr	1962	9	10-12-65	D,S	....	.....	C
13cbb2	do.	90	4	Dr	....	9	10-12-65	S	Clay	.....	
13cdd	Test hole 1260	115	5	Dr	1957	..	.....	T	....	930	LHi
13ddc	Walter Koering	...	2	Dr	....	Flow	7-10-58	D,S	Sand	.....	
14caa1	Mrs. A. B. Holmes	109	4	Dr	1937	28	7-14-58	D,S	Sand	.....	
14caa2	do.	90	4	Dr	....	28	7-14-58	S	Sand	.....	
14caa3	do.	18	30	Du	....	12.4	10- 8-65	N	Sand	.....	W
14cad	do.	90	4	Dr	....	28	7-14-58	S	Sand	.....	
15aad	Lawrence Sliper	321	2	Dr	1956	Flow	7-14-58	S	Sand	.....	Flows 8 gpm
15dcc	Earl Ellingson	365	2	Dr	1937	Flow	7-14-58	S	Sand	.....	
16add	Joe M. Overmoen	315	2	Dr	....	Flow	7-14-58	D,S	Sand	.....	
16bad	Henry Nysveen	358	2	Dr	1938	Flow	7-14-58	S	Gravel	.....	
16ccc	Karl Bagstad	262	2	Dr	1942	Flow	7-14-58	S	Gravel	.....	
18ada	Karl Oksoll	326	2	Dr	1948	Flow	7-14-58	D,S	Sand	.....	
18bbc	Palmer Grindland	360	2	Dr	1900	Flow	7-15-58	S	Sand	.....	
18cac	Garhard Arnegard	327	2	Dr	1942	Flow	7-15-58	D,S	Sand	.....	Will flow 18 gpm. Shut down to 4 gpm.
19cbd	Howard Johnson	360	3	Dr	1944	Flow	7-11-58	S	Sand	.....	
20aac	L. S. Thorstad	325	2	Dr	1942	Flow	7-11-58	S	Sand	.....	
20bbb	Leon Moen	...	..	Dr	....	Flow	7-11-58	S	Sand	.....	
20dad	P. J. Berg	340	2	Dr	1942	Flow	7-11-58	S	Sand	.....	
20dbc	Vernon Kaldor	320	2	Dr	1922	Flow	7-11-58	S	Sand	.....	
20ddb	Peter Bakkum	...	2	Dr	....	Flow	7-11-58	S	Sand	.....	
22bcd	Enoch Olson	425	2	Dr	1884	Flow	7-11-58	S	Sand	.....	
22ccd	Alvin A. Olson	425	2	Dr	1925	Flow	7-11-58	S	Sand	.....	
23dcc	Raymond Mueller	333	2	Dr	1947	Flow	7-10-58	D,S	Sand	.....	
24bbd	Anton Skyberg	50	..	Dr	1943	20	7-11-58	D,S	Sand	.....	SC 540
24bc	A. C. Peterson	21	48	Du	1931	13.10	6- 5-48	D,S	Sand	.....	
24cdd1	Hilman Skyberg	55	..	Dr	1938	18	7-10-58	D	Sand	.....	C
24cdd2	Observation well	92	1¼	Dr	1966	15.37	6-21-66	O	Sand	935	L, W, test hole 2541
24dcc	Ervin Koering	28	4	Dr	....	18	7-10-58	S	Sand	.....	C
25abb	Test hole 1259	105	5	Dr	1957	..	.....	T	....	937	LHi
25dcc	Test hole 1258	147	5	Dr	1957	..	.....	T	....	933	LHi
25dcd1	Tellef Klemetson	55	2	Dr	1955	20	7-10-58	D,S	Sand	.....	
25dcd2	do.	60	2	Dr	1956	20	7-10-58	N	Sand	.....	

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
146-51, Cont.											
26ccal	Mandley Johnson	...	2	Dr	....	Flow	7-10-58	S	....	.....	SC 3,420
26cca2	do.	70	..	Dr	....	20	7-10-58	D	....	.....	
28aacl	Joe M. Overmoe	235	2	Dr	1955	Flow	7-11-58	D,S	Sand	.....	
28aac2	do.	275+	2	Dr	1890	Flow	7-11-58	N	....	.....	
28ccc	Walter Kaldor	320	2	Dr	1951	Flow	7-11-58	S	Sand	.....	
28dd	J. J. Overmoen	310	2	Dr	1935	Flow	7-11-58	S	Sand	.....	
29aab	John Kaldor	375	2	Dr	1949	Flow	7-11-58	S	....	.....	
29adb	Morris Kaldor	...	..	Dr	1957	Flow	7-11-58	S	Sand	.....	
30aba	Mrs. Olga Simengard	375	2	Dr	1918	Flow	7-11-58	S	Sand	.....	
31cdd	Clarence Bakkum	280	3	Dr	1939	Flow	7-11-58	S	Sand	.....	
32aaa	Herbert Schlichtman	...	..	Dr	1892	Flow	7-11-58	S	Sand	.....	
32bbc	Lynn C. Kaldor	350	2	Dr	1918	Flow	7-11-58	S	Sand	.....	
33aca	Carvold Borke	265	2	Dr	1932	Flow	7-11-58	S	Sand	.....	
34bac	Mami Anderson	310	2	Dr	1953	Flow	7-11-58	S	Sand	.....	
35cad	Val Rohman	150+	..	Dr	....	Flow	7-11-58	D,S	Sand	.....	
35cbcl	Arthur Dahlstrom	...	2	Dr	....	Flow	7-11-58	S	Sand	.....	
35cbc2	do.	24.80	36	B	1956	21.70	7-11-58	D	Sand	.....	
35cccl	James Kraby	200	..	Dr	1894	Flow	7-11-58	S	Sand	.....	
35ccc2	do.	41	36	B	1956	30	7-11-58	D	Sand	.....	
35ccc3	do.	Spring	..	..	....	Flow	3-28-59	...	Sand	.....	CHi, flows 10 gpm
35dabl	Donald R. Hanson	160	2	Dr	1897	Flow	7-11-58	D,S	Sand	.....	
35dab2	do.	45	30	B	1954	20	7-11-58	D,S	Sand	.....	
35dcd	Raymond Hanson	360	..	Dr	1958	Flow	7-11-58	D,S	Sand	.....	
36aca	E. Schmaltz	50	4	Dr	1938	20	7-10-58	D,S	Sand	.....	SC 570
146-52											
lbac	David Johnson	325	..	Dr	1928	Flow	7-16-58	S	Sand	.....	Flows 8 gpm
lbcc	M. Ulland	380	..	Dr	1955	Flow	7-16-58	S	Sand	.....	Flows 7 gpm

1ddd	T. Andrew	365	3	Dr	1914	Flow	7-16-58	S	Sand	.....	Flows 8-10 gpm
2aaa	John I. Berg	354	2	Dr	1956	Flow	7-16-58	S	Sand	.....	Flows 7 gpm
2acc	Paul Ulland	437	..	Dr	1945	Flow	7-16-58	S	Sand	.....	Flows 1 gpm
3bcc	Carl Evans	344	2	Dr	1946	Flow	6-28-60	S	Sand	.....	Flows 3 gpm
4bdd	Melvin Evans	364	3	Dr	1955	Flow	6-28-60	S	Sand	.....	Flows 3.5 gpm
5cbc	Daniel Walker	27	36	Du	1953	20	1959	D	Sand	.....	
5dbc	Conrad Onstad	27.0	2	Dr	1935	14.2	6-27-60	N	Sand	.....	
5ddc	Knute Soholt	105	..	Dr	1949	Flow	6-27-60	S	Sand	.....	Flows 2 gpm
6a	City of Mayville	365	2	Dr	1921	Flow	7-18-21	S	Sand	.....	CP
7baa	Moe Estate	365	2	Dr	1952	Flow	6-28-60	S	Sand	.....	
7d	D. Evans	398	2	Dr	1944	Flow	1944	S	....	.....	
8acb	Hazel Chase	350	2	Dr	1950	Flow	6-28-60	S	Sand	.....	
8ddc	Clark Ewen	360	2	Dr	1936	Flow	6-27-60	S	Sand	.....	
9ada	Palvin Paulson	325	2	Dr	1940	Flow	6-27-60	S	Sand	.....	
10aba	Adolph Hanson	240	2	Dr	1920	Flow	6-27-60	S	Sand	.....	Flows 1 gpm
11baa	Oscar Neset	340	2	Dr	1934	Flow	7-16-58	S	Sand	.....	Flows 3 gpm
11bbb	Ralph Hanson	112	2	Dr	1890	Flow	7-16-58	S	Sand	.....	Flows 5 gpm
12bcd	K. T. Hanson	400	2	Dr	1890	Flow	7-16-58	S	Sand	.....	Flows 10 gpm
12cdd	N. A. Hanson	150	2	Dr	1938	Flow	1938	S	Sand	.....	Presently plugged
13abb	O. Kaldor	360	2	Dr	1917	Flow	7-16-58	S	Sand	.....	Flows 4 gpm
13add	McLain Paulson	332	2	Dr	1936	Flow	7-16-58	S	Sand	.....	
13bcc	Olaf Renden	365	2	Dr	1948	Flow	6-16-58	S	Sand	.....	Flows 5 gpm
14add	Adolph Hanson	152	2	Dr	1945	Flow	1945	D,S	....	.....	
15bbc	Andrew Skarperud	345	2	Dr	1938	Flow	6-27-60	S	Sand	.....	
15dbb	John Seltwedt	336	2	Dr	1935	Flow	6-27-60	S	Sand	.....	
16aab	Ed Solberg	60	24	B	1935	9	6-27-60	S	Sand	.....	
16bba	Albert Skarperud	367	2	Dr	1941	Flow	6-27-60	S	Sand	.....	Flows 1 gpm
16bbb	A. E. Bietz	50	6	Dr	1938	15	6-27-60	S	Sand	.....	
17a	D. C. Ewen	400	3	Dr	1936	Flow	1936	S	....	.....	
17bba	Rudolph Harstad	399	2	Dr	1940	Flow	6-27-60	S	Sand	.....	Flows 2 gpm
18aaa	Clark Ewen	360	3	Dr	1898	Flow	1947	S	....	.....	
18dcc	Mrs. Helen Harstad	380	2	Dr	1952	Flow	6-27-60	S	Sand	.....	Flows 0.5 gpm
20bbc	Alfred Tate	300	2	Dr	....	Flow	6-28-60	S	Sand	.....	Flows 0.5 gpm
20dcd	Henry Kjelsberg	380	2	Dr	1945	Flow	6-27-60	S	Sand	.....	
21dcc	Andrew Vekkend	350	2	Dr	....	Flow	6-27-60	S	Sand	.....	Flows 5 gpm

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
146-52,Cont.											
22bbb	Ed Solberg	200	2	Dr	1930	Flow	6-27-60	S	Sand	.....	
23cdc	Herman Heyen	365	2	Dr	1950	Flow	7-16-58	S	Sand	.....	Flows 3 gpm
24baa	Bjorn Tunseth	240	2	Dr	1941	Flow	7-16-58	S	Sand	.....	Flows 0.1 gpm
24daa	Norman Grindeland	360	3	Dr	1952	Flow	7-16-58	S	Sand	.....	Flows 10 gpm
25abb	J. L. Gadberry	325	2	Dr	1940	Flow	7-16-58	D,S	Sand	.....	Flows 8.5 gpm
26cbb	M. A. Ulland	338	2	Dr	1919	Flow	7-16-58	S	Sand	.....	Flows 4 gpm
27abd	Joe Dammen	345	2	Dr	1934	Flow	6-24-60	S	Sand	.....	
28dbc	C. A. Ulland	370	2	Dr	1936	Flow	1947	D,S	....	.....	
29aba	George Bratten	480	2	Dr	1960	Flow	6-27-60	S	Sand	.....	Flows 1.5 gpm
30aaa	Margrite Elken	300	2	Dr	1920	2	6-27-60	S	Sand	.....	
30bbb	Oscar Kjorness	385	2	Dr	1953	Flow	6-24-60	S	Sand	.....	Flows 3 gpm
31bbb	Test hole 147	37	4	Dr	1960	7.5	5-27-60	T	....	978	L
146-53											
1baa	Henry Klabo	411	2	Dr	1942	3.9	7-14-48	S	....	.....	
1bb	Portland Stockyard well	20	36	Du	....	5.2	7-14-48	S	....	.....	
1cbb	E. Moen	40	3	Dr	....	7	1948	S	....	.....	
2aab	Old Portland creamery	437	2	Dr	1934	2	1934	Ind	....	.....	Flows 35 gpm, CP
2aad	Test hole 7	335	5	Dr	1947	..	.....	T	....	.....	LP
2abc	Test hole 8	427	5	Dr	1948	..	.....	T	....	.....	LP
2cda	Clarence Klabo	20.0	24	Du	....	14.1	7-14-48	S	....	.....	
2dcc	Test hole 102	87	4	Dr	1960	20.0	5-13-60	T	....	1,000	L
2ddc	Test hole 101	37	4	Dr	1960	15.0	5-12-60	T	....	989	L
3add	Gilmont Harstad	435	3	Dr	1943	.5	7-14-48	S	....	.....	W
3bac1	S. Sanderson	414	2	Dr	1944	12	1948	S	....	.....	
3bac2	Hiram Sanderson	60	24	Du	....	59	1939	D	....	.....	Inadequate supply

3bac3	do.	10	48	Du	1936	6	1936	S	....	.....	Inadequate supply
4aac	Mrs. S. Stenerson	14	48	Du	1926	3	1926	N	....	.....	
4bbbl	Albert Hovde	509	3-1¼	Dr	1943	12	1943	S	....	.....	
4bbb2	Alton Hovde	15	36	Du	1931	..	.....	D,S	....	.....	
5aaal	James Strand	26	42	Du	1926	24	1939	D,S	....	.....	C
5aaa2	do.	530	2	Dr	1954	Flow	10- 7-65	S	....	.....	C, flows 5 gpm
5abb	Test hole 6	117	5	Dr	1947	..	.....	T	....	.....	LP
5cdd	Virgil VanWetchel	23.0	48	Du	1948	8.6	7-14-48	D,S	....	.....	SC 780
5dcc	Test hole 31	37	5	Dr	1948	..	.....	T	....	.....	LP
6aaa	Robert Evanson	130	3	Dr	1945	..	.....	S	....	.....	
6bdd	Joseph Berg	126	3	Dr	1938	14	1938	D,S	Sand	.....	
6cccl	Roy Peterson	44	24	B	1944	..	.....	S	....	.....	Poor quality
6ccc2	do.	12	24	Du	....	..	.....	D	....	.....	
7aaa	Test hole 32	47	5	Dr	1948	..	.....	T	....	.....	LP
7baa	Test hole 33	52	5	Dr	1948	..	.....	T	....	.....	LP
7ddd	Test hole 3	169	5	Dr	1946	..	.....	T	....	.....	LP
8aaa	Test hole 30	37	5	Dr	1948	..	.....	T	....	.....	LP
8ccc	Lewis Holkesvig	14	36	Du	1936	9	1936	D,S	....	.....	SC 730
8cdd	Test hole 4	161	5	Dr	1947	..	.....	T	....	.....	LP
8ddc	A. O. Anderson	22	48	Du	1920	17	1939	D	....	.....	Inadequate supply
8ddd	Test hole 5	156	5	Dr	1947	..	.....	T	....	.....	LP
9babl	John Hovland	28	..	B	1945	4	1948	S	....	.....	
9bab2	do.	23.0	24	B	1941	4.9	7-14-48	S	....	.....	CP
9ccd	Selmer Thuen	22	36	Du	1915	16	1939	...	....	.....	
9dcc	O. A. Thompson	50.0	24	B	1908	2.8	5- 9-47	S	....	.....	
10cdd	Spencer Wallen	385	2	Dr	1910	15	1947	S	....	.....	
11aaa	J. Kjos	90	24	B	1900	..	.....	N	....	.....	
11abb	do.	...	2	Dr	....	25	1948	S	....	.....	
12ada	Ole Syverson	385	..	Dr	1934	..	.....	D,S	....	.....	
14bca	Mrs. Ida Grinde	480	2	Dr	1944	Flow	6-24-60	S	Sand	.....	Flows 1.5 gpm
14dbb	L. Fyre	400	2	Dr	1933	Flow	1939	D,S	....	.....	
15caa	Edwin Holkesvig	36	24	B	1934	15	1939	D,S	....	.....	
16bbc	Test hole 21	102	5	Dr	1948	..	.....	T	....	.....	LP
16cbb	Test hole 22	102	5	Dr	1948	..	.....	T	....	.....	LP
16ccc	Test hole 23	102	5	Dr	1948	..	.....	T	....	.....	LP

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
146-53, Cont.											
17aab1	O. G. Holkesvig	20	48	Du	1927	12	1927	D,S	....	.....	
17aab2	do.	20	72	Du	1902	15	1939	D,S	....	.....	
17bb	S. Thuen	30	48	Du	1904	25	1939	D,S	....	.....	
18abb	G. Domier	26	..	Du	....	20	1939	D,S	....	.....	
18ccc	Arthur Domier	7	30	Du	....	1	.....	D,S	....	.....	
18dda	Hjalmer Hovland	20	72	Du	1931	18	.....	S	....	.....	
19abb	Leonard Domier	30	48	Du	1915	23	1939	D,S	....	.....	
19ddd	Clarence Domier	14	..	Du	1931	10	1931	...	....	.....	
20aab	O. P. Nelson	13	36	Du	....	10	1939	D,S	....	.....	
20baa	Oscar Domier	26	48	Du	1900	16	1900	D,S	....	.....	
20bbb	Arthur Stavedal	54	30	B	1935	25	1939	...	....	.....	
21bbb	Hjalmer Hovland	40	30	B	1941	22	1947	D,S	....	.....	
21bcc	Test hole 24	102	5	Dr	1948	..	.....	T	....	.....	LP
22add	J. Grinde	55	32	B	1935	35	1939	S	....	.....	
22cbb	Cora Nelson	60	24	B	1920	..	.....	D,S	....	.....	
22daa1	J. R. Grinde	50	48	B	1900	..	.....	S	....	.....	Inadequate supply
22daa2	do.	50	48	B	1935	10	1935	S	....	.....	
23cab	Grinley Estate	412	1½	Dr	....	Flow	6-24-60	S	Sand	.....	Flows 0.25 gpm
24dcd	Gjervold Bros.	420	2	Dr	1948	Flow	6-24-60	S	Sand	.....	Flows 2 gpm
25aaa	V. Rockney	415	3	Dr	1937	Flow	1937	...	....	.....	
25ccc	Oscar Rosevold	432	3	Dr	1937	Flow	1937	...	....	.....	
26aab1	C. Koppang	36	24	B	1920	20	1920	S	....	.....	
26aab2	do.	36	24	B	1927	20	1927	S	....	.....	
26ccc1	Bernhard Grinde	40	24	B	....	..	.....	...	....	.....	Inadequate supply
26ccc2	do.	26	36	Du	....	20	1939	D,S	....	.....	
26dcc	O. Anderson	417	3	Dr	1939	Flow	1939	D,S	....	.....	
28bab	Martha Aaserud	18	48	Du	1955	8.2	6-21-60	D,S	Sand	.....	Adequate except in summer.

28bbb	Test hole 25	102	5	Dr	1948	..	.....	T	....	.....	LP
28ccc	Test hole 208	32	4	Dr	1960	..	.....	T	....	1,085	L
28cddl	Theodore Amb	Spring	..	..	....	Flow	1947	...	....	.....	Flows 10 gpm from beach ridge.
28cdd2	do.	18	120	Du	1946	Flow	.....	PS	....	.....	CP
28cdd3	Test hole 2	216	5	Dr	1947	..	.....	T	....	.....	LP
28ddcl	C. M. Aasem	16	48	Du	1928	14	1939	D,S	....	.....	Inadequate supply
28ddc2	do.	8	84	Du	1933	4	1933	S	....	.....	
28ddc3	Test hole 143	17	4	Dr	1960	..	.....	T	....	1,046	L
29bbb	L. Baldock	12	96	Du	1914	10	1939	D,S	....	.....	C
30bbbl	Arthur Kvernen	18	30	Du	1914	16	1914	D	....	.....	
30bbb2	do.	32	42	Du	....	28	1939	S	....	.....	
30dcdl	Betsy Knudson	12	36	Du	1933	8	1939	D	....	.....	
30dcd2	do.	15	36	Du	1946	6	5- 8-47	S	....	.....	
31d	C. J. Evanson	12	48	Du	1930	8	1939	...	....	.....	
32bbb	Test hole 209	42	4	Dr	1960	..	.....	T	....	1,105	L
32dcc	Gerhard Haugen	25.0	..	Du	....	19.3	6-21-60	S	Sand	.....	
33abd	V. Smith	11	48	Du	1931	7	1939	D,S	....	.....	
33bbb	Test hole 1	172	5	Dr	1947	..	.....	T	....	.....	LP
33dbb	A. Anderson	Spring	..	..	....	Flow	1947	...	....	.....	Flows 30-42 gpm
34aaa	G. Harstad	400+	2	Dr	....	+.67	10- 7-65	N	Sand	.....	W
34bbb	Joseph N. Amb	20	24	Du	....	10	1939	D,S	....	.....	
35baa	Test hole 146	37	4	Dr	1960	14.7	5-27-60	T	....	1,001	L
35bad	Test hole 145	37	4	Dr	1960	..	.....	T	....	1,001	L
35bbb	Test hole 144	87	4	Dr	1960	15.0	5-27-60	T	....	1,011	L
147-49											
2adb	Orris Renslen	308	3	Dr	....	22	8-29-57	D,S	Sand	.....	
2dca	Herman Sondreal	300	2	Dr	1953	12	8-29-57	D,S	Sand	.....	SC 2,170
3cddl	Ervin Hedde	300	2	Dr	....	25	8-29-57	S	Sand	.....	
3cdd2	do.	13	48	Du	....	9	8-29-47	S	Gravel	.....	SC 1,800
4bdc	Carl Munter	180	2	Dr	....	14	6-20-58	D,S	Sand	.....	
4ddc	Albert Bjorge	162	2	Dr	1915	20	8-29-57	D,S	Sand	.....	
5bcb	Hubert Dufner	151	2	Dr	1949	20	8-29-57	D,S	Sand	.....	SC 3,780
5dcd	Stanley Hauge	178	2	Dr	1935	9	8-29-57	D,S	Sand	.....	
6abb	T. A. Carson	190	2	Dr	1895	20	8-29-57	D,S	Sand	.....	
6cdcl	Martin Nettum	180	2	Dr	....	15	8-29-57	D	Sand	.....	
6cdc2	do.	180	3	Dr	....	20	8-29-57	S	Sand	.....	

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147-49, Cont.											
7aba	Alfred Hettervig	173	2	Dr	....	12	8-29-57	D,S	Sand	.....	
8abb	Olive Borreson	165	2	Dr	....	8	6-18-58	D,S	Sand	.....	
8bab	Ole Gunlickson	160	2	Dr	1945	14	9-16-57	D,S	Sand	.....	
8cdd	Mrs. H. O. Brokke	137	3	Dr	....	10	8-29-57	D,S	Sand	.....	
8dcd	Berent Johnson	165	2	Dr	1922	7	8-29-57	D,S	Sand	.....	SC 2,280
9aab	Roy L. Gordon	165	2	Dr	1943	12	8-29-57	D,S	Sand	.....	SC 1,320
9bab	George Kondle	180	2	Dr	....	15	9-13-57	D,S	Gravel	.....	
9ccd1	John Arndt	175	3	Dr	1938	..	.....	D	Sand	.....	SC 2,280
9ccd2	do.	175	3	Dr	1942	..	.....	S	Sand	.....	
10aaa	Ole Sondrol	178	3	Dr	....	16	9-16-57	D,S	Sand	.....	
10cdd	Selmer Wegge	300	3	Dr	1917	15	8-29-57	D,S	Sand	.....	
11dbc1	Annie Peterson	373	2	Dr	1916	16	8-29-57	D	Sand	.....	
11dbc2	do.	275	2	Dr	1933	16	8-29-57	S	Sand	.....	
14bba	Gilbert Rensland	380	2	Dr	1927	60	6-18-58	D,S	Sand	.....	C
14cbc	Carl Bratager	360	2	Dr	1927	12	9-16-57	D,S	Sand	.....	
14dca	Ernest Peerson	375	2	Dr	....	8	9-13-57	D,S	Sand	.....	
15add	Bordin Wegge	230	2	Dr	1920	10	8-29-57	D,S	Sand	.....	
15baa	Ovey Wegge	210	2	Dr	....	10	9-13-57	D,S	Sand	.....	
15cbb	Carl Sondreal	206	2½	Dr	1910	10	9-16-57	D,S	Sand	.....	
17bcc	Malcolm Tweten	200	2	Dr	....	25	8-29-57	D,S	Sand	.....	
18abb	Markus Tronson	210	2	Dr	....	14	6-18-58	S	Sand	.....	
18cc	James Crane	257	2	Dr	1945	50	9-13-57	D,S	Sand	.....	SC 6,370
19cbb	Z. S. Crane	265	2	Dr	....	12	9-13-57	S	Sand	.....	
20bbc	Lloyd Abentroth	165	..	Dr	....	8	9-13-57	D,S	Sand	.....	
20cbc	P. Thompson	250	2	Dr	....	60	9-13-57	N	Sand	.....	
20dcd	Earl Abentroth	167	2	Dr	....	..	9-13-57	D,S	Sand	.....	
21aad	Daisy Abentroth	410	2	Dr	....	15	9-13-57	D,S	Sand	.....	
22ada	Mrs. Ida Tronnes	300	2	Dr	....	8	9-16-57	S	Sand	.....	

22bbb	Martin Berg	200	3	Dr	....	12	9-16-57	D,S	Sand	.....	SC 2,640
22ddd	Albert Haugstad	194	2	Dr	1943	8	9-16-57	D,S	Sand	.....	
23adb	Edwin Palm	310	2	Dr	....	12	9-16-57	D,S	Sand	.....	
23cca	A. Bjornstad	340	2	Dr	....	14	9-16-57	D,S	Sand	.....	SC 1,960
24bba	Lambert Olson	148	2	Dr	....	Flow	9-13-57	D,S	Sand	.....	
25cda	Merrill V. Ness	...	2	Dr	1908	15	6-27-58	D,S	Sand	.....	
26bad	Haugstad Estate	180	2	Dr	....	20	9-16-57	N	Sand	.....	
27abd	John Bagge	180+	2	Dr	....	8	9-16-57	N	Sand	.....	
27bcc	Selmer Wegge	285	2	Dr	....	25	9-16-57	N	Sand	.....	
27bda	Anton Thompson	200	2	Dr	....	6	9-16-57	D	Sand	.....	
28add	Chester Johnson	240	2	Dr	....	..	.....	N	Sand	.....	SC 2,830
29aaa	Thora Frendberg	216+	2	Dr	1928	60	6-27-58	D	Sand	.....	
29dad	Annie Howland	170	2	Dr	1954	14	9-13-57	D,S	Sand	.....	
30aba	W. J. Johnson	195	2	Dr	1946	40	9-13-57	D,S	Sand	.....	
30bab	John Paulsrud	200	2	Dr	1919	12	9-16-57	N	Sand	.....	
30daa	Clarence Brokke	140	..	Dr	1937	13	10- 4-37	S	Sand	.....	SC 1,920, LL
31bbb	John M. Anderson	380	..	Dr	....	14	9-16-57	D,S	Sand	.....	
33cdd	Fred Doeden	140	2	Dr	....	12	9-16-57	D,S	Sand	.....	SC 2,700
34aaa	Walter Bagge	400	2	Dr	....	12	9-16-57	D,S	Sand	.....	SC 2,040
34cdd	John C. Anderson	...	2	Dr	....	8	6-26-58	D,S	....	.....	
34dcd	Tom Wright	160	2	Dr	....	6	9-16-57	D,S	Sand	.....	
35aaa	Vernon Morehart	172	2	Dr	1949	7	6-26-58	D,S	Sand	.....	C
36bdb	O. Brooke	248	..	Dr	....	..	.....	S	....	.....	
147-50											
1aad	Leonard Boyer	193	3	Dr	1938	Flow	6-18-58	D	Sand	.....	
1bcb	Theodore Wheeler	251	4	Dr	1937	7	6-18-58	D,S	Sand	.....	LL
2bbal	Eunice Johnson	286	2	Dr	1942	6	6-19-58	D,S	Sand	.....	
2bba2	do.	285	..	Dr	1915	16	6-19-58	N	....	.....	
2ccc	Lars Smette	290	2	Dr	1952	25	6-19-58	S	....	.....	SC 5,880
3aac	Ruben Gunderson	180	2	Dr	1939	6	6-19-58	D,S	Sand	.....	
4ada	Lynn Nettum	312	2	Dr	1951	1	6-19-58	S	Sand	.....	
4baa	Stanley Lerom	354	3	Dr	....	9	6-19-58	D,S	Sand	.....	
4ccd	Wallace Nygaard	347	2	Dr	1945	15	6-19-58	S	Sand	.....	SC 7,300
4dac	John Seablom	318	2	Dr	1957	Flow	9-17-57	S	Sand	.....	SC 6,000
5bbb	Test hole 203	12	4	Dr	1960	14.1	6-27-60	T	....	924	L
7aaa	Ted Matson	165	2	Dr	1946	Flow	7- 5-60	S	Sand	.....	

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147-50, Cont.											
7ddc	Obort Hettervig	140	2	Dr	1950	7.2	6-30-60	S	Sand	.....	
9baa	E. B. Tilton	190	2	Dr	....	Flow	6-19-58	S	Sand	.....	
10aa	Clarence Finneseth	175	..	Dr	....	..	.....	D,S	Sand	.....	SC 3,720
10aaa	Test hole 202	22	4	Dr	1960	..	.....	T	....	893	L
10bbc	Christ N. Smith	320	2	Dr	1948	16	6-18-58	S	Sand	.....	SC 5,880
10cdd	Duane Davis	188	2	Dr	1954	20	9-17-57	D,S	Sand	.....	
11dad	Art Jeglum	180	2	Dr	1937	16	6-18-58	D,S	Sand	.....	
12aad	Estella Mohn	180	3	Dr	....	Flow	6-18-58	D,S	Sand	.....	C
12bcb	Benny Johnson	180+	2	Dr	1890	16	9-17-57	S	Sand	.....	
13aba	E. Johnson	145	2	Dr	....	2	9-17-57	D,S	Sand	.....	
14ada	William Tronson	191	2	Dr	1957	1	9-17-57	S	Sand	.....	
14bdd	Heller Halvorson	288	2	Dr	1952	10	6-18-58	S	Sand	.....	
14ccc	Test hole 201	30	4	Dr	1960	..	.....	T	....	899	L
14daa	Art Jeglum	180	2	Dr	1946	5	6-18-58	D,S	Sand	.....	
16aad	Andreas Jorstad	170	..	Dr	1939	20	6-19-58	D,S	Sand	.....	
17bcc	Kenneth O.Lilleberg	270	..	Dr	....	..	.....	S	Sand	.....	SC 4,800
17cbc	Test hole 200	22	4	Dr	1960	..	.....	T	....	930	L
17ccb	Test hole 199	27	4	Dr	1960	4.4	6-24-60	T	....	934	L
17dbc	Rueben Gunderson	170	1¼	Dr	1918	Flow	6-19-58	D,S	Sand	.....	
18dcd	Ansgar Bjerklund	12	84	Du	1964	3.0	8-26-65	PS	Sand and gravel	.....	C
18dda	Test hole 222	112	4	Dr	1961	2.0	8-17-61	T	....	956	L
19abb1	Wilson and Crane	15	36	Du	....	12	6-29-60	D	Sand and gravel	.....	
19abb2	do.	15.35	30	Du	1910	12.25	6-30-60	D,S	Sand and gravel	.....	
19abb3	do.	16.20	72	Du	1936	10.34	6-30-60	S	Sand and gravel	.....	
20baa	Harvey Lilleberg	...	..	Dr	....	Flow	6-20-58	S	Sand	.....	
20cdd1	Christ Smith	160	2	Dr	....	10	6-20-58	D,S	Sand	.....	
20cdd2	do.	16	48	Du	....	11	6-20-58	N	Sand	.....	Inadequate supply
22abb	Melvin Waslien	198	4	Dr	1918	..	.....	S	Sand	.....	
22bba	Rudolph Lilleberg	174	2	Dr	1955	8	6-19-58	S	Sand	.....	

23aaa	Henry Pauls	175	3	Dr	1938	1	6-19-58	S	Sand	.....	
23bbc	Ole Anderson	...	2	Dr	1920	6	6-19-58	N	....	.....	
23dcc	Carl W. Olson	175	2	Dr	1937	2	6-19-58	S	Sand	.....	
24abb	Bennett Mohn	240	2	Dr	1954	30	6-19-58	S	Sand	.....	SC 6,000
24bbc	Inga Gunderson	160	2	Dr	1942	Flow	6-19-58	S	Sand	.....	
24ddc	M. B. Johnson	190	2	Dr	1926	45	6-19-58	S	Sand	.....	
26bcc	Frank B. Cecka	175	1 3/4	Dr	....	80	7- 1-58	S	Sand	.....	
26cdc	Gilbert Gunderson	168	2	Dr	1950	12	6-26-58	S	Sand	.....	
26ddc	Ervin Lilleberg	270	2	Dr	....	..	.....	S	Sand	.....	
27abb	James Enger	270	2	Dr	1952	100	6-19-58	S	Sand	.....	
27cbb	Julian Harstad	280	2	Dr	1943	25	6-26-58	S	Sand	.....	
28cdc	John Kozojed	172	3	Dr	1932	20	6-26-58	D,S	....	.....	SC 3,120
29ccc	L. H. Ross	240	3	Dr	1923	2	6-27-58	S	Sand	.....	
30add	Lyng Bros.	160	3	Dr	....	6	6-29-60	S	Sand	.....	
31baa	Earl Mueller	380	..	Dr	1952	Flow	1952	S	Sand	.....	Flows 0.5 gpm
31cdd	L. T. Rohman	398	3	Dr	1950	Flow	7-11-58	...	Sand	.....	SC 5,040, flows 3 gpm
33bab	Percy Foss	172	3	Dr	....	20	6-26-58	D,S	....	.....	SC 3,720
33ddd	Test hole 2377	276	5	Dr	1965	..	.....	T	....	901	L
34add	Walter H. Vettel	159	3	Dr	1918	13	6-26-58	D,S	Sand	.....	
34cbb	Oscar Holland	180	2	Dr	....	25	6-26-58	S	Sand	.....	
34dda	Paul Smith	160	2	Dr	....	50	6-27-58	S	Sand	.....	
36bbb	Mrs. Clara Anderson	265	2	Dr	....	3	6-19-58	S	....	.....	
147-51											
1aba	Waldemar Huus	150	1	Dr	....	15	7- 5-60	S	Sand	.....	
1bbb	Test hole 1969	210	5	Dr	1961	..	.....	T	....	944	L
1cba	Alvin Molvig	190	2	Dr	1945	Flow	7- 1-60	S	Sand	.....	
2adc	J. Soderberg	174	2	Dr	....	4.01	8- 8-46	S	....	.....	CB
2bdb	Milton Eliason	12	24	Du	....	10	7- 5-60	...	Sand	.....	
2dbc	E. Larson	187	2	Dr	1915	7	1946	S	....	.....	
3ddd	Adolph Soderberg	255	2	Dr	1934	7	7- 5-60	S	Sand	.....	
4bab	Howard Spaeth	22	36	Du	....	20.8	8-15-60	D,S	....	.....	
4cdc	A. M. Birkeland	80	3	Dr	1936	29.4	8-15-46	D,S	....	.....	SC 1,400
4dac	J. Seablom	18.0	8	B	1936	11.19	8-15-46	D	....	.....	CB

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
147-51, Cont.											
4dba	Test hole 5	45	4	Dr	1946	..	.....	T	....	.....	LB
4dbb	Test hole 6	39	4	Dr	1946	..	.....	T	....	.....	LB
4ddd	Test hole 7	52	4	Dr	1946	..	.....	T	....	.....	LB
5acb	Theodore Enrud	15	..	Du	1953	9	7- 1-60	D,S	Sand and gravel	.....	
5caa	Alvin Balkan	15	72	Du	1930	12	7- 1-60	D,S	Sand and gravel	.....	
5ccb	Theodore Enrud	315	2	Dr	1935	60	7- 1-60	S	Sand	.....	
6dad	Test hole 132	22	4	Dr	1960	7.8	5-24-60	T	....	979	L
6dda	Test hole 131	22	4	Dr	1960	14.0	5-24-60	T	....	991	L
6ddd	Test hole 133	20	4	Dr	1960	..	.....	T	....	977	L
8ccb	Lawerence Devold	274	2	Dr	1939	14	7- 5-60	S	Sand	.....	
8dcd	Albert Lunde	150	2	Dr	....	12	7- 1-60	S	Sand	.....	SC 4,800
9dcc	E. Olson	67	3	Dr	1930	18	6-30-60	D,S	Sand	.....	
10ada	O. C. Nydahl	250	2	Dr	1929	6	7- 1-60	S	Sand	.....	
10ddd	Peder O. Foss	103	2	Dr	1925	36	6-30-60	S	Sand	.....	SC 3,600
11bab	Hilma Eliason	440	2	Dr	1942	3	1946	S	....	.....	CB
11ddb1	C. Moger	14	36	Du	1937	10	6-30-60	D	Sand and gravel	.....	
11ddb2	do.	14	48	Du	1937	8	6-30-60	S	Sand and gravel	.....	Inadequate supply
11ddd1	do.	255	3	Dr	1905	30	6-30-60	S	Sand	.....	
11ddd2	do.	15	36	Du	1905	12	6-30-60	D	Sand and gravel	.....	Inadequate supply
12aab	Gilbert M. Spillum	395	2	Dr	1945	Flow	7- 1-60	S	Sand	.....	Flows 1.75 gpm
12bcb	Curtiss Hong	165	1½	Dr	1936	Flow	7- 5-60	S	Sand	.....	Flows 1 gpm
13dad	Alfred Skrivseth	180	2	Dr	1948	20	6-30-60	S	Sand	.....	
14aca1	Anna Locken	240	3	Dr	1925	..	.....	...	....	.....	
14aca2	do.	14	36	Du	1920	11	6-30-60	D	Sand and gravel	.....	
14bcb	Test hole 1976	170	5	Dr	1961	..	.....	T	....	965	L
15ccd1	H. Monroe	67	2	Dr	1954	7	6-30-60	S	Sand	.....	SC 640
15ccd2	do.	65	2	Dr	1953	7	6-30-60	S	Sand	.....	
15ccd3	do.	14	48	Du	....	8	6-30-60	S	Sand	.....	

16abb1	Joseph Olson	70	3	B	1930	18	6-30-60	S	Sand	.....	SC 600
16abb2	do.	35	3	B	1940	18	6-30-60	D,S	Sand	.....	
16bab1	Phillip Egge	100	2	Dr	1956	2.84	10-18-65	O	Sand	.....	W
16bab2	do.	100	2	Dr	1960	..	.....	D,S	Sand	.....	C
16dad	Mrs. H. Finstrom	40	2	Dr	....	12	6-30-60	D,S	Sand	.....	SC 780
17aab	Joseph Egge	200	4	Dr	1957	12	7- 1-60	S	Sand	.....	SC 4,920
17ddd	Martin Ulland	16	..	Du	1910	11	6-30-60	D,S	Sand and gravel	.....	
18ced	Arthur Endrud	400	2	Dr	1900	6	6-30-60	S	Sand	.....	
19abc	M. Anderson	267	2	Dr	1956	7	6-29-60	D,S	Sand	.....	
20add	Melvin Nelson	14	40	Du	1935	10	6-29-60	D,S	Sand and gravel	.....	
22bbb	Observation well	101	1¼	Dr	1965	2.62	10- 4-65	O	Sand	965	C, W, L, test hole 2382.
22bdd	Mrs. H. Finstrom	40	2	Dr	1948	8	6-30-60	S	Sand	.....	
22dcd	Clarence Anderson	40	36	Du	1960	10	6-29-60	D,S	Sand	.....	
23cdc	Christ Schmaltz	385	4	Dr	1943	14	6-30-60	S	Sand	.....	SC 4,320
25dcc	H. Sorley	366	3	Dr	1943	12	7- 8-48	D,S	Sand	.....	
27ccd	L. Anderson	170	3	Dr	1946	14	6-29-60	S	Sand	.....	
27ddd1	Test hole 1331	95	5	Dr	1958	..	.....	T	....	958	L
27ddd2	Mrs. Carl Nelson	125	3	Dr	1932	20	6-29-60	S	Sand	.....	SC 3,480
28add	Nels Johnson	225	2	Dr	....	5	6-29-60	S	Sand	.....	
28bbd1	Carl Hovland	9.4	48	Du	1915	5.8	6-29-60	D,S	Sand and gravel	.....	
28bbd2	do.	12	48	Du	1915	7	6-29-60	D,S	Sand and gravel	.....	
28dcc1	John Johnson	12	36	Du	1930	9	6-27-60	D	Sand	.....	
28dcc2	do.	225	2	Dr	1925	18	6-29-60	S	Sand	.....	
29dad1	F. C. Larson	14	36	Du	1915	5	6-29-60	D	Sand and gravel	.....	
29dad2	do.	250	2	Dr	1935	6	6-29-60	S	Sand	.....	
30cdd	Joe Schultz	340	2	Dr	1944	..	.....	S	....	.....	
32ddd	Test hole 11	190	5	Dr	1948	..	.....	T	....	.....	LP
33abb1	Mrs. H. Anderson	7	36	Du	1930	6	6-29-60	D	Sand	.....	
33abb2	do.	353	2	Dr	1954	9	6-29-60	S	Sand	.....	
34ada1	C. A. Anderson	35	..	Du	1956	26	7-11-58	D	Sand	.....	
34ada2	do.	125	3	Dr	1957	..	.....	S	....	.....	C
34ddd1	Observation well	120	1¼	Dr	1965	11.18	10- 4-65	O	Sand and gravel	958	C, W, L, test hole 2376.
34ddd2	Observation well	205	1¼	Dr	1965	3.62	10- 4-65	O	Sand and gravel	958	C, W, L, test hole 2376.

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147-51, Cont.											
35bbb1	Willard Burnett	35	72	Du	....	2	7-11-58	S	....	.....	
35bbb2	do.	35	60	Du	....	2	7-11-58	D	....	.....	
147-52											
1ccc	Ole Lande	...	2	Dr	1910	20	7- 5-60	S	Sand	.....	
1dcc	Oscar Rosevold	390	3	Dr	1934	18	7- 1-60	S	Sand	.....	
3ccc	Olaf Lande	400	4-2	Dr	1926	10	1939	S	....	.....	
3daa	G. Aasen	162	2	Dr	1934	26	1939	...	....	.....	SC 4,800
4dca	G. N. Burnsdale	500	3-2	Dr	1920	20	1939	S	....	.....	
5bbc	Alvin Domier	532	2	Dr	1947	20	1947	S	Sand	.....	
6ccc	Louis Larson	350	2	Dr	1912	40	1939	S	....	.....	
7cdd	F. Enger	460	2	Dr	1889	18	1939	S	....	.....	
8ccc	Oscar Haugen	440	4-2	Dr	1934	15	1939	S	....	.....	
10bcc	Gunder Carlson	410	3-1¼	Dr	1924	20	1939	S	....	.....	
10ddd	Arthur Hefta	396	2	Dr	1888	12	6-28-60	D,S	Sand	.....	
11ccc	Christ B. Egge	105	..	Dr	1945	20	.....	S	Sand	.....	SC 3,840
12bab	Peter Thoreson	365	3	Dr	....	..	.....	S	Sand	.....	SC 4,220
12dad	Nels Thoreson	332	2	Dr	1945	20	7- 1-60	S	Sand	.....	
13ccb	Larson and Farup	360	3	Dr	1935	18	6-30-60	S	Sand	.....	
14add	Raymond Schreiner	250	2	Dr	1944	..	.....	S	Sand	.....	SC 4,560
14dbc	Alfred Kjus	120	2	Dr	1910	7.78	1948	N	Sand	.....	
15ccc	S. N. Rosevold	...	2	Dr	1889	20	1939	S	....	.....	
15ddd	W. Roman	350	2	Dr	1889	12	1939	S	....	.....	
16adb	M. Tastad	400	3-2	Dr	1927	20	1939	S	....	.....	
17cbb	Carl Brunsdale	375	1-1½	Dr	1914	20	1939	S	....	.....	
20add	Carrie Frigstad	385	1-2	Dr	1918	16	1939	S	....	.....	
20caa	David Osland	458	2	Dr	1889	14	1939	S	....	.....	
21aaa	H. Neset	320	3	Dr	1937	16	1939	D,S	....	.....	LL

21bbb	G. Lilleberg	354	3	Dr	1937	16	1939	D,S	....	.....	LL
21ccc	L. Aamold	369	3	Dr	1937	15	1939	D,S	....	.....	LL
21dcd	Test hole 142	20	4	Dr	1960	..	.....	T	....	975	L
21ddd	F. Kapfer	346	3	Dr	1937	15	1939	D,S	....	.....	LL
22abb	J. C. Larson Est.	313	2	Dr	1930	12	1939	S	....	.....	
22ccb	Earl Nelson	165	3	Dr	1940	40	6-28-60	S	Sand	.....	SC 4,220
24bbc	Larson and Farup	360	3	Dr	1937	18	6-30-60	S	Sand	.....	
24cdc	Raymond Schreiner	275	2	Dr	1907	6.1	6-28-60	S	Sand	.....	
24ddd	Merlin Johnson	135	3	Dr	1952	8	6-30-60	S	Sand	.....	
25cba	Chester Viseth	400	2	Dr	....	Flow	6-28-60	S	Sand	.....	
26cbb	Clara Morstad	370	..	Dr	....	12	7-15-58	S	Sand	.....	
27dcd	C. M. Nelson	352	2	Dr	1934	3	1939	D,S	....	.....	
28dda	Eddie Lindaas	385	2	Dr	1898	8	1939	...	....	.....	
29aaa	C. F. Enger	400	2	Dr	1889	20	1939	S	....	.....	
30add	George Osland	454	3-2	Dr	1931	12	1939	S	....	.....	
30bbc	Even Evenson	446	4-2	Dr	1936	7	1939	...	....	.....	
30dcc	Ida Enger	375	2	Dr	1958	12	6-28-60	S	Sand	.....	
31cba	E. Christianson	480	3	Dr	1898	Flow	1948	S	....	.....	
31ccc	Test hole 9	135	5	Dr	1948	..	.....	T	....	.....	LP
31dad	Mayville Creamery	393	4	Dr	1944	7	6-19-48	Ind	....	.....	CP
32c	St. Anthony and Dakota Elev. Co.	20	18	..	....	..	.....	S	....	.....	CP
33dcc	J. Kjos	233	2	Dr	1918	17	1939	S	....	.....	
33ddd	Test hole 10	561	5	Dr	1948	..	.....	T	....	.....	LP
35ddd	Sidney Rosevold	367	2	Dr	1941	Flow	6-16-58	S	Sand	.....	
36dcc	M. B. Kjorness	350	2	Dr	1958	Flow	6-15-58	S	Sand	.....	C, flows 3.5 gpm
147-53											
1ccc	Elmer Strand	447	3-2	Dr	1935	25	1939	S	....	.....	
2dac	L. I. Skadeland	460	2	Dr	1912	70	1945	S	Sand	.....	
3dcd	Peterson	480	2	Dr	1947	40	5-15-60	S	Sand	.....	SC 5,520
3ddc	Test hole 106	23	4	Dr	1960	..	.....	T	....	.....	L
4bcd	Ole Livedalen	32	60	Du	1920	16.2	6-22-60	D,S	Sand	.....	
5baa	Kermit Wastvedt	155	3	Dr	1949	40	1949	D,S	Sand	.....	SC 1,560
6bbb	Harry Nelson	80	18	B	1936	45	1939	S	....	.....	
6ddc	B. Moncrieff	530	2	Dr	1944	32	6-22-60	S	Sand	.....	SC 5,760

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147-53, Cont.											
7ddc	William Goughnour	118	3	Dr	1945	30	1945	S	Sand	.....	SC 1,320
8cba	W. H. Dolve	525	1½	Dr	1910	..	.....	S	Sand	.....	
9cddl	Andrew Olson	20	48	Du	1934	12	1934	S	....	.....	Inadequate supply
9cdd2	Test hole 104	52	4	Dr	1960	..	.....	T	....	1,028	L
9dcc	Test hole 105	17	4	Dr	1960	..	.....	T	....	1,024	L
10cdb	Albert Gubberud	490+	1¼	Dr	1915	30	1950	S	Sand	.....	
11dac	Carl J. Olson	375	2	Dr	1960	35	6-24-60	S	Sand	.....	
11ddc	C. J. Olson	45	48	Du	1927	22.8	7-13-48	S	....	.....	
12daa	O. C. Larson	352	3-2	Dr	1938	34	1938	S	....	.....	
12dab	Ole C. Larson	352	2	Dr	1938	30	6-22-60	D	Sand	.....	
13dcd	C. F. Enger	300	4-3	Dr	1942	15	1942	S	....	.....	SC 4,800
14abb	D. Lien	412	2	Dr	1948	Flow	1948	S	....	.....	CP
14adc	Robert Strand	378	2	Dr	1947	35	6-24-60	S	Sand	.....	
14ccc	C. J. Olson	465	4	Dr	1943	..	.....	S	....	.....	
15bbb	Reubon Enger	585	1½	Dr	1915	60	1954	N	Sand	.....	
16bcc	Nels Nerdahlen	500	2	Dr	1934	50	1939	S	....	.....	
16dcd	Garvin Braaten	80	3	Dr	1939	6.9	7-13-48	S	....	.....	SC 2,880
17cca	Mrs. Martha Amb	...	..	Dr	1935	8.6	6-22-60	S	Sand	.....	
17ccb	Martin Amb	81	36	Du	1934	8	1939	D	....	.....	SC 1,800
18caa	Hjlmer Brenden	37	24	Dr	1935	17.7	6-22-60	S	Sand	.....	
18ddd	Ingolf Amb	25	36	Du	1932	20	1932	S	....	.....	Inadequate supply
19adc	Oscar Haugen	75	24	B	1932	1.95	6-22-60	S	Sand	.....	
19bca	Ingolf Amb	8	36	Du	1939	6	1939	S	....	.....	
19c	Nels Berg	25	36	Du	1932	22	1932	S	....	.....	
19cba	Rolf Berg	36	24	B	1952	15.7	6-21-60	S	Sand	.....	
19cda	P. J. Haugen	41	24	B	1943	35	1960	S	Sand	.....	Inadequate supply
20adb	Nicolai Amb	58	..	Dr	1934	Flow	6-22-60	S	Sand	.....	Flows 0.5 gpm
20bbc	T. Amb	...	24	Dr	....	32.2	6-21-60	...	....	.....	

21ccb	Orlo Heskin	119	3	Dr	1945	30	1945	D,S	Sand	.....	
22aaa	George Strand	450	2	Dr	1913	12	1948	S	....	.....	
24adb	do.	500	4	Dr	1931	15	1948	S	....	.....	
24bcd	Norman Haugen	450	4	Dr	1942	10	1942	S	....	.....	
24cdc	Test hole 103	42	4	Dr	1960	..	.....	T	....	993	L
25ccc	Test hole 14	126	5	Dr	1948	..	.....	T	....	.....	LP
25cdd1	Peter Paulson	25	30	Du	1944	18.1	7-12-48	N	....	.....	
25cdd2	do.	430	3	Dr	1944	14	1944	D,S	....	.....	
26aaa	Ed Anderson	450	4	Dr	....	20	1948	S	....	.....	
26cad	Test hole 40	37	5	Dr	1948	....	.....	T	....	....	LP
26cc	Ed Fyre	476	2	Dr	1945	Flow	1948	S	....	.....	Flows 20 gpm
26ddc	H. A. Heskin	490	3-1½	Dr	1921	Flow	1948	S	....	.....	CP, flows 0.5 gpm
27aca	Otto Flaten	5	42	Du	1933	2	1948	S	....	.....	
27bba	Ted Strand	500	3-1½	Dr	1942	..	.....	S	....	.....	
27daa	Test hole 43	27	5	Dr	1948	..	.....	T	....	.....	LP
27dad1	Test hole 39	12	5	Dr	1948	..	.....	T	....	.....	LP
27dad2	Test hole 42	37	5	Dr	1948	..	.....	T	....	.....	LP
28adb	Theo. Strand	497	3-1¼	Dr	1943	18	1943	N	....	.....	
28cdc	Albert Hefta	470	4	Dr	1928	7	1948	S	....	.....	
29cca	O. Ives	530	3-2	Dr	1944	32	1944	S	....	.....	
29dab	Gordon Houd	600	2	Dr	1910	15	1948	S	....	.....	
30abb	Ingvold Berg	557	3½-2	Dr	1933	20	1939	S	....	.....	
30ccc	O. G. Grandalen	518	3-1¼	Dr	1934	Flow	6-21-60	S	....	.....	Flows 3 gpm
30dcc	Jurgene Amundson	160	2	Dr	1954	8	12-54	D,S	Sand	.....	SC 1,800
31aaa	Alvin Amundson	134	3	Dr	1903	13	1939	D,S	....	.....	
31abb	Jurgene Amundson	500	2	Dr	1936	Flow	6-21-60	D	Sand	.....	Flows 2 gpm
31bbb	O. N. Berg	14	42	Du	1931	12	1939	S	....	.....	
31cca	do.	106	3	Dr	1939	40	1939	D,S	....	.....	
33ddb	Ludvig Haugen	16	36	Du	....	15.3	7-14-48	D	....	.....	
34adc	H. O. Myx	450	2	Dr	1945	Flow	1948	S	....	.....	
34cac	Sander Amundson	490	2	Dr	1945	Flow	1948	S	....	.....	CP
35aaa	Test hole 13	147	5	Dr	1948	..	.....	T	....	.....	LP, CP
35aad	Test hole 27	92	5	Dr	1948	..	.....	T	....	.....	LP
35ada1	Test hole 15	116	5	Dr	1948	..	.....	T	....	.....	LP
35ada2	Test hole 26	67	5	Dr	1948	..	.....	T	....	.....	LP

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147-53, Cont.											
35ccb	Gilbert Haagenson	471	2	Dr	1950	11	1950	S	Sand	.....	
35cda	do.	471	3	Dr	1944	14	1944	S	....	.....	
35dab	Test hole 16	130	5	Dr	1948	..	.....	T	....	.....	LP
35dbb	Portland city well	32	720	Du	1951	..	.....	PS	....	.....	
35ddc1	Portland (new) creamery	450	3	Dr	1948	4	1948	Ind	....	.....	CP
35ddc2	School well	450	3-2	Dr	1948	..	.....	PS	....	.....	
35ddc3	Frank Rose	105	..	Dr	....	..	.....	...	....	.....	CP
36acc	Test hole 45	42	5	Dr	1948	..	.....	T	....	.....	LP
36bca	Edgar Carlstad	360	1	Dr	....	3.5	6-24-60	S	Sand	....	
36caa	Test hole 44	37	5	Dr	1948	..	.....	T	....	.....	LP
36cad	Test hole 17	120	5	Dr	1948	..	.....	T	....	.....	LP
36cbb	Test hole 41	42	5	Dr	1948	..	.....	T	....	.....	LP
36dbc	Bernhard Nelson	28	2	Dv	1952	18	6-22-60	D,S	Sand	.....	
148-49											
3bbd1	Clarence Grove	226	2	Dr	1955	20	8-28-57	D,S	....	.....	C
3bbd2	do.	230	2	Dr	1948	20	8-28-57	S	....	.....	
5adb	Arthur Sondreal	175	2	Dr	....	20	8-28-57	D,S	Sand	.....	SC 2,400
5da	Myhre Bros.	180	3	Dr	....	15	6-16-58	D,S	Sand	.....	
6dda	Otto M. Larson	172	2	Dr	....	11	8-28-57	D,S	Sand	.....	
7bad	Ole Danielson	237	2	Dr	....	12	.....	D	Sand	.....	Plugged
7ccd	Julius Erickson	159	2	Dr	....	12	8-28-57	D,S	Sand	.....	C
8bbb	Test hole 2384	231	5	Dr	....	..	.....	T	....	861	L
8ddd1	Edwin Cooper	165	2½	Dr	....	20	8-28-57	S	Sand	.....	Inadequate supply, SC 1,980.
8ddd2	Test hole 1323A	262.5	5	Dr	1958	..	.....	T	....	866	L

9ccd	Ole Aamodt	180	2	Dr	....	20	8-28-57	D	Sand	.....	
9dcd1	do.	185	3	Dr	....	19	8-28-57	D,S	Sand	.....	
9dcd2	do.	210	3	Dr	1965	32	7-16-65	D,S	Sand and gravel	.....	L
10caa	Gilmore Severson	220	2	Dr	....	5	6-16-58	D	Sand	.....	
15baa	Test hole 1329	142	5	Dr	1958	..	6-27-58	T	....	873	L
16aaa	Willard Thompson	180	2	Dr	1917	Flow	6-16-58	S	Sand	.....	
16dcc	Elmer Sondrol	176	2	Dr	....	20	8-28-57	D,S	Sand	.....	SC 1,440
17aaa1	Edwin Cooper	165	2½	Dr	....	20	8-28-57	D,S	Sand	.....	
17aaa2	Test hole 1323	63	5	Dr	1958	..	.....	T	....	865	L
17bbb	Test hole 1325	215	5	Dr	1958	..	.....	T	....	861	L
17cdd	George Keller	175	2	Dr	1947	20	8-28-57	D,S	Sand	.....	
17ddb	Ed Whitwer	180	2	Dr	1954	18	8-28-57	D,S	Gravel	.....	
18aab	Olaf Ertsgard	180	2	Dr	....	15	8-28-57	D,S	Sand	.....	
18bab	James Nesvig	160	2	Dr	....	15	8-28-57	D,S	Sand	.....	
18bbb	Test hole 1322	230	5	Dr	1958	..	.....	T	....	862	L, C
18ccc	Test hole 1327	225	5	Dr	1958	..	.....	T	....	869	L
18dcc	Ferdinand Johnson Estate	180	2	Dr	1947	25	8-28-57	D,S	Sand	.....	
18dcd	I. H. Nesvig	180	2	Dr	....	30	8-28-57	D,S	Sand	.....	
19dcd	Morris Rogenes	160	2	Dr	....	30	9-16-57	D,S	Gravel	.....	SC 2,160
20baa	Dennis Mickelson	180	2	Dr	1954	20	8-28-57	D,S	Gravel	.....	
21bab1	Jerome Nesvig	180	2	Dr	1954	10	8-28-57	S	Sand	.....	
21bab2	do.	188	3	Dr	1951	10	8-28-57	D	Sand	.....	
21cac1	L. Sondreal	170	2	Dr	1951	11	8-28-57	D,S	Sand	.....	
21cac2	do.	170	2	Dr	1915	11	8-28-57	S	Sand	.....	
22abc1	Alfred Torgerson	164	2	Dr	1945	18	8-28-57	D,S	Sand	.....	
22abc2	do.	265	2	Dr	....	50	8-28-57	N	Sand	.....	Inadequate supply
22dda	Milford Vettern	180	2	Dr	....	..	.....	D,S	Gravel	.....	
26abc	Mary Petterson	180	2	Dr	1905	Flow	6-17-58	D,S	Sand	.....	
26caa	Erickson Estate	218	2	Dr	....	20	8-28-57	D,S	Sand	.....	
26dab	Norman Erickson	180	2	Dr	....	20	8-28-57	D,S	Sand	.....	
28bab	Marlo Sondrol	168	3	Dr	....	16	8-28-57	D,S	Sand	.....	C
28cdd	Stanley Erickson	200	2	Dr	1904	25	8-28-57	D,S	Sand	.....	
30aba	Arthur Rogenes	170	2½	Dr	....	30	8-28-57	D,S	Gravel	.....	
30cbb	Oscar Rogenes	218	2	Dr	....	25	8-28-57	D,S	Gravel	.....	SC 4,200

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
148-49, Cont.											
31ccc	E. Hettervig	208	2	Dr	....	15	8-28-57	S	Sand	.....	
33baa	Anton Rogenes	180	2	Dr	....	30	8-28-57	D,S	Sand	.....	SC 2,760
35aaa	Stanley Erickson	180	2	Dr	1933	Flow	8-28-57	D,S	Sand	.....	
35acc	Ole Sondrol	180	2	Dr	....	Flow	8-28-57	N	Sand	.....	
35ddd	K. Vettern	282	2	Dr	1927	20	8-29-57	D,S	Sand	....	SC 2,820
148-50											
1abd	Bentru Bros.	160	..	..	....	20	8-29-57	N	Sand	.....	
1bab	Evela and Agnes Botten	130	2	Dr	1924	..	.....	S	Sand	.....	SC 5,040
1cdc	Arnold Jenson	230+	..	..	....	80	6-16-58	S	Sand	.....	C
1ddd	Test hole 1326	168.5	5	Dr	1958	..	.....	T	....	860	L
2bab	Bert Jenson	168	2	Dr	1908	28	6-16-58	S	Sand	.....	SC 3,600
2ddd	M. Peterson	160	3	Dr	....	..	.....	N	....	.....	
3bba	Henry Brekke	23	48	Du	....	12	8-29-57	S	....	.....	
3cbb	George Moen	17.5	48	Du	....	11.3	6-16-58	S	Sand	.....	
5bbb	Matt Von Ruden	350	2	Dr	....	..	.....	N	Sand	.....	Flowed at one time
5ddc	B. Knutson	300+	2	Dr	....	..	.....	N	Sand	.....	
6cbb	Ole Sondrol	180	..	Dr	....	..	.....	S	....	.....	
6daa	Bertel Kvitne	110	2	Dr	1935	14	7-6-60	S	Sand	.....	
6dcd	Ralph Weigel	340	2	Dr	1920	6	6-17-58	N	Sand	.....	
8ddd	Test hole 1320	220.5	5	Dr	1958	..	.....	T	....	881	LR
9dcd	Howard Brieland	300+	..	Dr	....	6	9-16-57	S	Sand	.....	
10aaa	Vic Horne	190	3	Dr	1951	18	6-16-58	D,S	....	.....	
10cbb	Milford Hovet	160	2	Dr	1950	30	9-13-57	S	Sand	.....	
10ddd	Thelmer and O-dan Hovet	315	2	Dr	1918	15	9-13-57	...	Sand	.....	
11aaa	Test hole 1970	210	5	Dr	1961	..	.....	T	....	860	LR

11adb1	Knute Kjelmeland	160	2	Dr	....	15	6-16-58	S	Sand	.....	
11adb2	do.	20	6	Dr	1922	15	6-16-58	D	Clay	.....	
11dab	Osmund Roiland	19	..	Dr	1944	13	6-16-58	D	Clay	.....	
11ddd	Test hole 1324	220	5	Dr	1958	..	.....	T	....	860	LR
12abb	Martin Bartelson	160	..	..	....	20	8-29-57	N	Sand	.....	
12cdd	E. Hedde	25.58	3	Dr	....	8.76	9-13-57	N	....	.....	
12ddc	Clifford Erickson	160	2	Dr	....	14	6-16-58	N	Sand	.....	
13ccc1	Test hole 2383	283.5	5	Dr	1965	..	.....	T	....	873	L
13ccc2	Test hole 2537	390	5	Dr	1966	..	.....	T	....	873	L
13dcd	L. M. Mikkelson	184	3	Dr	1950	..	.....	D,S	Sand	.....	
14bbb	Test hole 1321	189	5	Dr	1958	..	.....	T	....	870	LR
14ccc	Clara and Emma Hovet	21	8	Du	....	..	.....	D	....	.....	
15bbc	Test hole 2387	42	5	Dr	1965	..	.....	T	....	876	L
15cdd	Test hole 2385	42	5	Dr	1965	..	.....	T	....	875	L
15dcc	William Omlid	15	42	Du	....	3.73	8- 5-65	N	....	.....	W
16ccd	R. B. Camrud	165	2	Dr	1952	50	9-16-57	S	Sand	.....	
17bbb	Test hole 207	22	4	Dr	1960	15.7	6-27-60	T	Sand	897	L
17ccd	H. Haug	365	2	Dr	....	8	9-16-57	S	Sand	.....	
18dcb	C. Thompson	410	2	Dr	1953	40	7- 5-60	S	Sand	.....	
19ccd	R. Gregorie	315	2	Dr	1934	16	.....	S	....	.....	
20abb	Test hole 2388	63	5	Dr	1965	..	.....	T	....	890	L
20bab	Alfred Hagelie	370	3	Dr	1950	6	9-16-57	...	....	.....	
20ccc	Test hole 1963	210	5	Dr	1961	..	10-21-61	T	....	909	L
21bab	R. B. Camrud	170	2	Dr	1915	50	9-16-57	S	Sand	.....	
21ccd	Alfred Jacobson	182	3	Dr	....	..	.....	D,S	....	.....	SC 2,160
21ddd	L. L. Breiland	200	2	Dr	1895	40	.....	S	....	.....	SC 3,120
22ada	Test hole 2386	63	5	Dr	1965	..	.....	T	....	875	L
22adb	Township well	19	72	Du	1907	6	6-17-58	PS	Sand	.....	C
22cca	C. L. Riveland	210	2	Dr	1943	72	6-17-58	S	Sand	.....	
23dcc	George B. Gunderson	271	2	Dr	1930	16	9-13-57	S	Sand	.....	C
24aaa	Mrs. Inga Ingwalson	160	3	Dr	1950	17	6-17-58	D,S	Sand	.....	
24bbb	Tom A. Brooke	274	2	Dr	1949	16	9-13-57	S	Sand	.....	
24cdd	Oliver Odegard	185	2	Dr	1905	12	6-17-58	S	Sand	.....	SC 4,080
24ddd	Test hole 1328	189	5	Dr	1958	..	.....	T	....	868	L

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
148-50, Cont.											
25aba	Ernest L. Odegard	147	..	Dr	1949	21	9-13-57	D,S	Sand	.....	SC 1,380
26cca	Cliff Odegard	187	..	Dr	1943	14	9-16-57	S	Sand	.....	
26dcc	Gaylord Olson	265	2	Dr	....	..	.....	S	Sand	.....	
28bab	Inez Hauge Estate	175	2	Dr	....	20	6-17-58	N	Sand	.....	
28cdd	Orlin Gunderson	357	3	Dr	1938	..	.....	S	Sand	.....	SC 6,240
28ddc	Martha Gunderson Estate	356	3	Dr	1938	12	9-15-57	S	Sand	.....	
29cdc	Art Mehl	365	3	Dr	....	6	6-17-58	S	Sand	.....	
30abb	Henry Hagelie	372	2	Dr	1940	Flow	1946	S	....	.....	CB
30bcc1	O. J. Sorlie	385	2	Dr	1943	11	8-15-46	S	....	.....	
30bcc2	do.	275	2	Dr	1927	11	8-15-46	S	....	.....	
30bcd	do.	14	48	Du	1925	6.51	8-15-46	D	....	.....	CB
31baa	W. Page	165	3	Dr	....	6.7	8-15-46	S	....	.....	
33aaa	Wilford Gunderson	343	2	Dr	1943	9	6-17-58	N	Sand	.....	Plugged
34add	Clifford Gunderson	175	2	Dr	....	..	.....	D,S	Sand	.....	SC 4,080
148-51											
1aba	Tony Scholand	418	2	Dr	1947	9	9-17-57	S	....	.....	
1cdb	Mrs. Cora Braete	300	2	Dr	1890	1	7-15-58	N	Sand	.....	
2baa	J. Renners	18	48	Du	1955	15	7-10-58	S	Gravel	.....	
2dcd	Test hole 1960	210	5	Dr	1961	..	.....	T	....	931	LR
3cbc	Anton Linneman	165	2	Dr	1925	6	7-15-58	S	Sand	.....	
3ddd	Fred Ackerman	430	2	Dr	1938	7	7-15-58	S	Sand	.....	
4baa	Alvis Schultz	219	..	Dr	1953	Flow	7-17-58	S	Sand	.....	CR, flows 5 gpm
4dad	Anton Linneman	365	3	Dr	....	Flow	7-17-58	S	Sand	.....	
5bbb1	Chris Landa	360	3	Dr	1950	9	7-10-58	S	Sand	.....	
5bbb2	do.	18	48	Du	....	16	7-19-61	D	Sand	.....	Small supply

6acc	Hubert Von Ruden	185	3	Dr	....	12	7-10-58	S	Sand	.....	
6cac	Leo Schultz	215	3	Dr	1953	9	7-10-58	S	Sand	.....	
9abb	Alfonse Adams	200+	..	Dr	1931	Flow	7-15-58	S	Sand	.....	Flows 0.25 gpm
9daa	Leo Breidenbach	120	3	Dr	1955	70	7-15-58	S	Sand	.....	
10bbb	V. Ackerman	240	2	Dr	1920	Flow	7-15-58	S	Sand	.....	Flows 12 gpm
10ccc	Joe Linneman	290	2	Dr	1948	3	7-15-58	S	Sand	.....	
11aaa	C. Ellingson	18.15	48	Du	....	9.90	7-15-58	N	Sand	.....	On beach ridge
11caa	V. Leddige	220	..	Dr	1950	150	7-17-58	S	Sand	.....	Inadequate supply
12ddd	Test hole 1319	210	5	Dr	1958	..	.....	T	....	909	LR
13aab	Helmer Knudsvig	345	2	Dr	1945	17	7- 5-60	S	Sand	.....	
15aaa	Test hole 1193	468	5	Dr	1957	..	.....	T	....	943	LR
15cad	Louis Berthold	135	2	Dr	1933	9	7- 6-60	S	Sand	.....	SC 4,400
17aaa	Test hole 1192	189	5	Dr	1957	..	.....	T	....	955	LR
17dcc	Fuglesten Bros.	318	2	Dr	1945	35	7- 5-60	S	Sand	.....	
18cdc	Anton Rogenes	160	2	Dr	1920	35	7- 6-60	S	Sand	.....	
18dcc	Alvin Lerfald	35	48	Du	....	15.5	7- 6-60	S	Sand	.....	
19bdd	Mancur Olson	300	2	Dr	1942	40	7- 5-60	S	Sand	.....	
19cda	John Renners	11.5	42	Du	1952	7.0	7- 5-60	D,S	Sand	.....	
20aacl	Chris Knudsvig	16	40	Du	1920	14	7- 6-60	S	Sand	.....	
20aac2	do.	315	2	Dr	1906	20	7- 6-60	S	Sand	.....	
20ddb	Fuglesten Bros.	120	2	Dr	1920	16	7- 5-60	S	Sand	.....	SC 7,000
20ddd	do.	250	3	Dr	1910	8	7- 5-60	S	Sand	.....	
21daa	Eken Bros.	293	2	Dr	1946	Flow	1946	S	Sand	.....	CB
21dda	George Finstrom	265	1½	Dr	1949	..	.....	S	....	.....	
22cdd	do.	16	..	Du	....	12	7- 5-60	S	....	.....	
22dbdl	A. Schultz	18	48	Du	1881	15	7- 5-60	...	....	.....	
22dbd2	do.	190	2	Dr	1925	18	7- 5-60	S	....	.....	
23aaa	Martha Molvig	325	2	Dr	1936	20+	7- 6-60	S	Sand	.....	
23ccb	Test hole 206	27	4	Dr	1960	..	.....	T	....	955	L
24aadl	Ray Kloster	112	2	Dr	1928	20	7- 6-60	S	Sand	.....	
24aad2	Test hole 204	22	4	Dr	1960	9.5	6-27-60	T	....	914	L
24add	Ray Kloster	390+	2	Dr	1952	9.6	7- 6-60	S	Sand	....	
25cccl	Village of Buxton	17	96	Du	1921	10.24	8- 2-46	N	....	.....	CB
25ccc2	do.	19	144	Du	1936	13.24	8- 2-46	D,PS	....	.....	CB

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148-51, Cont.											
25ccc3	Henning Johnson	10	72	Du	....	8.52	8- 2-46	D,S	....	.....	CB
25ccc4	Test hole 1	29	4	Dr	1946	..	.....	T	....	.....	LB
25dac	Leroy Kubbervig	374	2	Dr	....	7.23	8-15-46	...	....	.....	CB
25dcd	Village of Buxton	212	2	Dr	1914	3.32	8- 2-46	PS,O	....	.....	CB, W
26babl	Tommy Thompson	18	36	Du	....	13.9	8- 2-46	N	....	.....	
26bab2	do.	448	2	Dr	1936	12.6	8- 2-46	S	....	.....	
26cdd	G. Spaeth	275	2	Dr	....	20	8- 2-46	S	....	.....	CB
26dda	Jens Molvig	16	48	Du	....	..	.....	N	....	.....	CB
26ddd1	do.	7	72	Du	....	4.09	8- 2-46	N	Gravel	.....	
26ddd2	Test hole 2	17	4	Dr	1946	..	.....	T	....	.....	LB
27abb	Asheim Estate	14	42	Du	1920	11	7- 5-60	S	....	.....	
27baa	T. and M. Asheim	18	..	Du	1932	16	7- 5-60	D,S	....	.....	
27cbcl	Manford Knudsvig	12	24	Du	1922	8	7- 5-60	D	....	.....	
27cbc2	do.	287	2	Dr	1947	12	7- 5-60	S	Sand	.....	
28aad	T. and M. Asheim	320	2	Dr	1944	9	8- 2-46	...	....	.....	CB
29aaa	Oscar Kjorlie	155	2	Dr	1950	38	7- 6-60	D,S	Sand	.....	
29caa	Gust Johnson	115	2	Dr	1956	12	7- 5-60	S	Sand	.....	SC 4,800
29ccc	Test hole 129	42	4	Dr	1960	..	5-24-60	T	....	983	L
30aaa	Melvin Finstrom	14	24	Du	....	10	7- 1-60	D,S	Sand and gravel	.....	
30acb	Clara Asheim	265	2	Dr	1955	25	7- 5-60	S	Sand	.....	
30ddd1	Ernest James	115	4	Dr	1941	8	8- 2-46	S	....	.....	CB
30ddd2	do.	14	6	Dr	1941	6	8- 2-46	D,S	....	.....	CB
32acc	Otto Bjerke	350	2	Dr	1918	..	.....	S	....	.....	
32bbd	Ludvig Knudsvig	128	2	Dr	....	15	7- 5-60	S	Sand	.....	SC 4,800
33aab	Melford Asheim	150	2	Dr	1950	10	7- 5-60	S	Sand	.....	SC 5,040
33ccb	Test hole 130	27	4	Dr	1960	13.9	5-24-60	T	....	986	L
34bbc	Melford Asheim	190	2	Dr	1945	8	7- 5-60	S	Sand	.....	SC 3,840

35aaa	Jens Molvig	11	60	Du	....	10.32	8- 8-46	N	....	.....	
36bbb1	Walter Vleck	16	48	Du	....	..	.....	D	....	.....	CB
36bbb2	do.	12	60	Du	....	8.22	8- 2-46	S	....	.....	
36bbb3	Test hole 205	32	4	Dr	1960	..	.....	T	....	.....	L
36cab	Test hole 3	14	4	Dr	1946	..	.....	T	....	.....	LB
36cbb	Test hole 4	35	4	Dr	1946	..	.....	T	....	.....	LB
148-52											
1abb	Hilman Troite	195	3	Dr	....	10	8-29-56	S	Sand	.....	
1cca	W. G. Breidenbach	14	36	Du	....	..	.....	D,S	Sand	.....	
1ccd	Test hole 120	27	4	Dr	1960	11.7	5-23-60	T	....	984	L
1cdc	Test hole 121	15	4	Dr	1960	8	5-23-60	T	....	979	L
1ddd	Test hole 122	22	4	Dr	1960	11	5-25-60	T	....	966	L
2abal	Mrs. A. Schabo	130	3	Dr	1938	50	8-29-56	D	Sand	.....	SC 4,440
2aba2	do.	14	..	Du	....	10	8-29-56	S	Gravel	.....	
2baa	Nick Von Ruden	145	3	Dr	1955	65	8-29-56	S	Sand	.....	SC 4,640
2bba	do.	12	36	Du	....	8	8-29-56	D	Sand	.....	
4abb	L. Blaufuss	336	3	Dr	1927	30	8-30-56	S	Gravel	.....	
4dcc1	B. Hegstad	20	36	Du	....	16	7-13-57	D	Sand	.....	
4dcc2	do.	430	4	Dr	....	..	.....	S	Sand	.....	
4dcd	B. G. Hegstad	11	72	Du	1942	2	7-13-57	D,S	Sand	.....	
5baa	Lawrence Lavin	420	3	Dr	1937	..	.....	S	Sand	.....	
6aac	Louis Huus	446	3	Dr	1929	46	8-30-56	S	Sand	.....	
7bbb	Carl Foss	472	2	Dr	1930	48	8-30-56	S	Sand	.....	
7cdd	Gus Lillemoen	15.5	48	Du	....	13.16	8-30-56	S	Sand	.....	Inadequate supply
8ccc	E. Soliah	450	3	Dr	1907	..	.....	S	Sand	.....	
8cdd	Test hole 112	37	4	Dr	1960	..	.....	T	....	1,014	L
8ddd	Charles Lavin	435	3	Dr	....	40	8-30-56	S	Sand	.....	
9aab	H. Soliah	14	36	Du	....	4	9- 7-56	D	Sand	.....	
9add	Test hole 117	32	4	Dr	1960	13.0	5-20-60	T	....	994	L
9dda	Test hole 116	27	4	Dr	1960	..	.....	T	....	1,000	L
9ddd	Alvin Lerfald	13.4	36	Du	....	9.5	8-30-56	S	Sand	.....	
10bcc1	A. C. Sorenson	9	3	Dv	....	5	.....	D	Gravel	.....	CH
10bcc2	do.	Spring	..	..	....	Flow	.....	...	....	.....	
10cdc	Martin Von Ruden	11.5	..	..	....	7.4	8-30-56	S	Sand	....	
11ccd	William and Wallace Neiss	104	3	Dr	....	..	.....	D,S	Sand	.....	SC 3,240

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
148-52, Cont.											
12aab	L. Schultz	65	21	Dr	1930	18	9- 7-56	S	Sand	.....	
12ccd	William Krogstad	15.60	36	Du	....	10.10	9- 7-56	S	Sand	.....	
13aaa	Test hole 1191	126	5	Dr	1957	..	.....	T	....	965	L
13bbb	Test hole 123	32	4	Dr	....	..	.....	T	....	976	L
13bbc	Test hole 124	27	4	Dr	1960	11.1	5-23-60	T	....	989	L
13bcc	Test hole 125	12	4	Dr	1960	..	.....	T	....	994	L
13bcd1	John Buer	300	2	Dr	1933	..	.....	S	....	.....	
13bcd2	do.	13.2	36	Du	....	12.2	3-26-59	D	Gravel	.....	C, goes dry occasionally.
13dcd	Test hole 127	32	4	Dr	1960	12.6	5-24-60	T	....	987	L
14bbb1	Richard Lerfald	83	..	Dr	1913	68.6	8-30-56	S	....	.....	
14bbb2	Test hole 1190	220	5	Dr	1957	..	.....	T	....	980	L
14cbc	Ruben Lerfald	300	3	Dr	1949	23.4	9- 7-56	S	Sand	.....	SC 4,440
14dcc	Test hole 126	12	4	Dr	1960	16.0	5-23-60	T	....	987	L
15baa	Test hole 115	27	4	Dr	1960	7.3	5-20-60	T	....	992	L
15bab	Test hole 2389	52.5	5	Dr	1965	..	.....	T	....	995	L
15bba	Test hole 114	37	4	Dr	1960	7.5	5-20-60	T	....	997	L
15dba	Joseph Lerfald	10.30	36	Du	1950	6.25	9-10-56	D,S	Sand and gravel	.....	
16aaa	Alvin Lerfald	9.0	36	Du	....	6.8	6-30-56	D	Sand	.....	
16daa	Test hole 118	12	4	Dr	1960	13.8	5-20-60	T	....	1,003	L
16ddc	V. J. Von Ruden	215	3	Dr	....	90	8-30-56	S	Sand	.....	SC 4,200, adequate for 56 head of cattl
17aaa	Test hole 1189	73	5	Dr	1957	..	8-17-57	T	....	999	LH
17bab	Orval Frigstad	430	4	Dr	....	18	8-30-56	S	Sand	.....	SC 5,760
17ccc	Edward Soliah	425	2	Dr	1900	50	9-13-56	S	Sand	.....	CH
18bbd	L. Lunde	420	2	Dr	1931	85	7-18-57	S	Sand	.....	
19dad	Helmer Lee	495	2	Dr	1929	..	.....	S	....	.....	
20bcc	Andrew Lee	162	2	Dr	1934	40	9-13-56	S	Sand	.....	CH

20ccc	Henry Lee Jr.	160	..	Dr	1953	40	9-10-56	S	Sand	.....	
21dcc	Emil Bina	400	..	Dr	....	..	.....	D,S	....	.....	
22aba	J. Jenson	180+	..	Dr	....	40	9- 7-56	S	....	.....	
22baa	Test hole 119	10	4	Dr	1960	..	.....	T	....	994	L
23acb1	Ben Liening	300	3	Dr	....	..	9- 7-56	S	Sand	.....	
23acb2	do.	16.0	48	Du	....	12.8	.....	D	Sand		
23ddd	Wm. Scholand	297	2	Dr	1944	28	7-15-58	S	Sand	.....	
24aaa	Test hole 128	17	4	Dr	1960	9.4	5-24-60	T	....	980	L
24aab	Rueben Lerfold	12.2	..	Du	....	8.3	9- 7-56	D,S	Sand	.....	
24cbd	George Niemeier	310	2	Dr	1959	40	7- 5-60	S	....	.....	
27aad1	George Rice	460	3	Dr	1916	..	.....	S	....	.....	
27aad2	do.	13.8	72	Du	....	11.0	9-10-56	D	....	.....	
27cdc	Arthur Osland	167	3	Dr	1931	22	11-12-65	S	Sand	.....	SC 4,440
28aac	Mrs. Orra Larson	160	3	Dr	....	..	.....	S	....	.....	
29bcb	Harold Moen	18	36	Du	....	14	9-11-56	S	Sand	.....	
29ccc	Test hole 140	22	4	Dr	1960	16.5	5-26-60	T	....	1,008	L
29cdd	Test hole 141	20	4	Dr	1960	..	.....	T	....	997	L
30aaa	Mrs. G. Kopseng	500	4	Dr	....	6	9-10-56	S	Sand	.....	
31cdd	George Staupe	465	3	Dr	1916	30	9-11-56	S	Sand	.....	
33abd	R. Osland	140	3	Dr	....	..	.....	S	Sand	.....	SC 4,320
34ddd	Walter Osland	160	2	Dr	1944	15	9-10-56	S	Gravel	.....	SC 4,440
35bbb	Mrs. Selmer Erfjord	340	2	Dr	....	..	.....	S	....	.....	
36add	Anne Sollid	290	..	Dr	1924	20	7- 1-60	S	Sand	.....	
36dcd	Orville Thoreson, Et al	415	..	Dr	....	..	.....	N	....	.....	Caved in
148-53											
1aba	Harry Ness	32	..	Du	1950	30	7-10-57	S	Sand	.....	
1abb	do.	11	..	..	1952	5	7-10-57	D	Sand	.....	
1cdc	Carl Johnson	449	..	Dr	1927	..	.....	S	Sand	.....	
2add	E. K. Naastad	525	..	Dr	1934	..	.....	S	Sand and gravel	.....	
3abb	Oscar Soliah	35	..	Du	....	..	.....	D,S	Sand	.....	SC 1,800
4acd	Carl Smestad	32	72	Du	1940	..	.....	D,S	Sand	.....	
4bbc1	Mrs. R. Digness	32	36	Du	Old	25	7-10-57	D	Sand	.....	
4bbc2	do.	32	60	Du	....	25	7-10-57	S	Sand	.....	
4dbb	Thor Lonne	40	..	Du	1954	7	7-13-57	D,S	Sand	.....	SC 3,120

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
148-53, Cont.											
5aac	Ida Jensen	27	30	Du	....	10	7-10-57	D,S	Sand	.....	
5aba	NDSWC 762-9	210	5	Dr	1965	..	.....	T	....	.....	L
5bcb	Test hole 1975	210	5	Dr	1961	..	.....	T	....	.....	L
5ccc	Art Hauge	26	72	Du	....	12	7-13-57	D,S	Sand	.....	
7aab	Observation well	38	4	Dr	1965	11.02	9-10-65	O	Sand	1,075	L, C, W, test hole 2390.
7baa	Test hole 1163	210	5	Dr	1956	..	.....	T	....	1,075	LH
7ccc1	Test hole 1155	250	5	Dr	1956	..	.....	T	....	1,079	LH
7ccc2	Observation well	197	1¼	Dr	1965	45.62	6-29-66	O	Sand and gravel	.....	L, W, NDSWC test hole 762-14.
7cdd	Dean Osking & Co.	507	..	Dr	1964	97	1964	T	Sand	.....	L
7ddd	NDSWC 762-12	252	5	Dr	1965	..	.....	T	....	.....	L
8abb	Test hole 1971	210	5	Dr	1961	..	.....	T	....	.....	L
8acc	Hans Grimson	24	..	Du	1952	5	7-13-57	S	Sand	.....	
8bba	Test hole 1973	200	5	Dr	1961	..	.....	T	....	.....	L
8bbb	Test hole 1972	210	5	Dr	1961	..	.....	T	....	.....	L
8cca	Olaf Bye	207	5	Dr	1964	42	1964	T	Sand	.....	L
8daa	Test hole 1974	220	5	Dr	1961	..	.....	T	....	.....	L
8dbb	Arnold Brandon	196	5	Dr	1962	29	1962	D,S	Sand	.....	C
8dcc	Test hole 1160	230	5	Dr	1956	..	.....	T	....	1,071.6	LH
9bbb	Oscar Agotnass	30	36	Du	1925	10	7-13-57	S	Sand	.....	
10bdd	Olaf Bye	25	36	Du	1915	4	7-13-57	S	Clay	.....	
10cdd	Theo. Huus	45	..	Du	1939	25	7-18-57	S	Sand	.....	
10dcc	Test hole 1162	185	5	Dr	1956	..	.....	T	....	1,036	LH
10dcd	Gail Bye	267	5	Dr	1964	..	.....	T	....	.....	L
12cdd	Knute Lillemoen	15.91	36	Du	1950	11.96	7-18-57	S	Sand	.....	
12dcc	Art Lillemoen	10	..	Du	....	..	.....	D	....	.....	CH
13aba	G. Lillemoen	20.60	..	Du	....	19.40	7-18-57	S	Sand	.....	
13abb	Test hole 111	22	4	Dr	1960	7.6	5-19-60	T	....	1,017	L

13baa	Test hole 110	32	4	Dr	1960	6.1	5-19-60	T	....	1,035	L
13bba	Test hole 109	27	4	Dr	1960	7.7	5-19-60	T	....	1,038	L
13bbb	Test hole 113	22	4	Dr	1960	..	.....	T	....	1,032	L
13bdc	Mrs. Guy Thorson	12	..	Du	1954	4	7-18-57	S	Sand	.....	
14aaa	Test hole 1182	598	5	Dr	1957	..	.....	T	....	1,033	LH
14ccd	Conrad Soliah	485	2	Dr	1913	67	1950	S	Sand	.....	SC 5,640
15daa	Albert Bjertness	50	..	Du	1927	..	.....	N	Sand	.....	
15dcc	Jerome Holtel	128	..	Dr	1947	..	.....	D,S	Sand	.....	C
16abb	Test hole 1161	210	5	Dr	1956	..	.....	T	....	1,057	LH
17aaa	Melvin Bjerke	24.8	36	Du	1934	14.0	9-13-56	S	Sand	.....	CH
17dcc	L. Awes	21.1	..	Du	....	10.6	9-13-56	N	....	.....	
18abb1	Test hole 1154	510	5	Dr	1956	..	.....	T	....	1,079	LH
18abb2	NDSWC 762-1	273	5	Dr	1965	..	.....	T	....	.....	L
18abb3	NDSWC 762-4	273	5	Dr	1965	..	.....	T	....	.....	L
18abd1	Hatton city well 1	240	..	Dr	....	..	.....	PS	Sand and gravel	.....	CH
18abd2	Hatton city well 2	239	..	Dr	....	..	.....	PS	Sand and gravel	.....	C
18abd3	Observation well	277	1¼	Dr	1965	133.61	11- 2-65	O	Sand and gravel	.....	L, C, W, NDSWC test hole 762-2.
18acb	City of Hatton	40	72	Du	1930	9.22	7- 8-57	O	Sand	.....	C, W
18adb	City of Hatton	45.2	60	Du	1930	12.92	7- 8-57	O	Sand	.....	W
18add	S. Sepoy	400+	2	Dr	....	..	.....	S	Sand	.....	
18bcc	Test hole 1156	250	5	Dr	1956	..	.....	T	....	1,074	LH
19cbb	Nobell Pladson	20	48	Du	1956	18	7- 2-57	S	Sand	.....	
19dcd	Test hole 1164	220	5	Dr	1956	..	.....	T	....	1,079	LH
20bbb	Oscar Arneson	35.47	36	Du	....	10.47	7-31-57	S	Sand	.....	
20dab	Oscar Bakken	40	36	Du	1915	25	7-31-57	S	Sand	.....	
21aaa	NDSWC 762-7	252	5	Dr	1965	..	.....	T	....	.....	L
21bba1	Andrew A. Huus	30	48	Du	1945	4	7-31-57	D	Sand	.....	
21bba2	do.	34	24	Du	1942	..	.....	S	Sand	.....	
21ddc	Test hole 136	27	4	Dr	1960	..	.....	T	....	1,063	L
22aba	Glen Skjoiten	30	36	Du	....	24	9-13-56	S	....	.....	
22cbb	Foss Estate	28	48	Du	1898	20	7-31-57	D,S	....	.....	
23bbc	K. Mork	480	2	Dr	1930	60	7-31-57	S	Sand	.....	
23cdc	Test hole 137	22	4	Dr	1960	..	.....	T	....	1,028	L
23ddd	Test hole 138	27	4	Dr	1960	..	.....	T	....	1,029	L

Location number	Owner or name	Depth of well (feet)	Diameter or size (inches)	Type	Date collected	Depth to water below land surface (feet)	Date of measurement or report	Use of water	Aquifer	Altitude of land surface (feet)	Remarks
148-53, Cont.											
24cbd	E. Nelson	8.60	36	Du	1955	7.50	7- 2-57	D,S	Sand	.....	
24ccc	S. S. Omang	20	..	Du	1950	16	7- 2-57	D,S	Sand	.....	
25aaa	Test hole 139	27	4	Dr	1960	..	.....	T	....	1,028	L
25bbb	Mrs. Carl E. Johnson	12.05	..	Du	....	8.25	7- 2-57	N	Sand	.....	
26ddb	Mrs. Anna Stromberg	16.4	48	Du	1952	15.7	7- 2-57	D	Sand	.....	
27dcd	J. Wermedahl	465	2	Dr	1930	40	7- 2-57	S	Sand	.....	SC 2,400
28abb	A. Strand	33.10	48	Du	....	10.68	7- 2-57	S	....	.....	
28bba	A. Holman	27.6	48	Du	....	7.22	7- 2-57	S	....	.....	
28cdc	Carl Ramstad	21.00	48	Du	....	15.73	7-31-57	D,S	Sand	.....	
28ddd	Test hole 135	87	4	Dr	1960	10.2	5-25-60	T	....	1,040	L
29add	Township school	7.5	48	Du	....	7.2	7- 2-57	N	....	.....	
29bbb	Mrs. B. Soliah	24.55	72	Du	....	13.09	7-31-58	N	....	.....	
29ccd	Test hole 108	32	4	Dr	1960	9.0	5-17-60	T	....	1,063	L
30ccc	NDSWC 762-8	210	5	Dr	1965	..	.....	T	....	.....	L
31bbb	Test hole 107	87	4	Dr	1965	..	5-17-60	T	....	1,072	L
31bcc	Paul Vaagene	137	3	Dr	1955	..	.....	D,S	Sand	.....	
32aaa	Test hole 134	32	4	Dr	1960	..	.....	T	....	1,059	L
32add	Lawrence Nelson	30	36	Du	1950	10	7-31-57	D,S	Sand	.....	
32bbc1	N. Orland	540	2	Dr	1922	32	7-31-57	S	Sand	.....	SC 5,760
32bbc2	do.	28	36	Du	1945	20	7-31-57	D	Sand	.....	
33aca	Albert Holman	17.60	60	Du	1937	11.59	7-31-57	D,S	Sand	.....	

TABLE 2.--Water-level records of selected observation wells

Depth to water in feet below land surface

144-50-26ccb2

Date	Water level	Date	Water level	Date	Water level
Sept. 30, 1965.....	5.45	Jan. 25, 1966.....	5.14	June 29, 1966.....	3.85
Nov. 2.....	2.72	Mar. 22.....	5.65	Aug. 2.....	4.84
Nov. 30.....	4.40	April 29.....	1.37	Sept. 1.....	2.62
Dec. 30.....	4.79	May 26.....	2.22	Sept. 29.....	4.22

144-51-12dcc

Aug. 18, 1965.....	26.88	Feb. 2, 1966.....	26.53	June 29, 1966.....	26.18
Oct. 4.....	26.73	Mar. 22.....	26.64	Aug. 2.....	26.12
Nov. 2.....	26.70	May 6.....	26.37	Sept. 1.....	26.17
Nov. 30.....	26.60	May 26.....	26.28	Sept. 29.....	26.0
Dec. 30.....	26.59				

144-52-21aab

Sept. 30, 1965.....	10.63	Mar. 14, 1966.....	13.12	July 19, 1966.....	9.90
Nov. 2.....	9.80	Mar. 22.....	12.98	Aug. 2.....	10.56
Nov. 30.....	10.25	April 29.....	10.62	Sept. 1.....	11.08
Dec. 29.....	10.40	May 26.....	7.98	Sept. 28.....	11.54
Jan. 26, 1966.....	11.77	June 29.....	8.75		

145-50-24bbc

Oct. 5, 1965.....	10.46	Jan. 26, 1966.....	11.29	June 29, 1966.....	6.79
Nov. 2.....	10.30	Mar. 22.....	9.38	Aug. 2.....	7.87
Nov. 30.....	10.01	April 29.....	8.37	Sept. 1.....	8.13
Dec. 30.....	10.40	May 26.....	7.47	Sept. 29.....	9.35

145-51-1adc1

Oct. 11, 1965.....	46.10	Feb. 24, 1966.....	46.25	July 19, 1966.....	46.06
Oct. 14.....	46.08	Mar. 22.....	45.61	Aug. 2.....	45.96
Nov. 2.....	46.22	April 8.....	44.72	Sept. 1.....	46.04
Nov. 30.....	46.13	April 29.....	44.80	Sept. 29.....	46.24
Dec. 29.....	46.24	May 26.....	44.98		
Jan. 26, 1966.....	46.51	June 29.....	45.49		

145-51-1ddc

Oct. 4, 1965.....	41.78	Mar. 22, 1966.....	41.62	June 29, 1966.....	40.82
Nov. 2.....	41.43	April 8.....	41.33	Aug. 2.....	40.80
Nov. 30.....	41.32	April 29.....	41.17	Sept. 1.....	40.77
Dec. 30.....	41.45	May 26.....	40.92	Sept. 29.....	40.55
Jan. 26, 1966.....	42.28				

Depth to water in feet below land surface

145-53-28adb

Date	Water level	Date	Water level	Date	Water level
Nov. 30, 1965.....	+.20	April 29, 1966.....	+.39	Aug. 2, 1966.....	.96
Dec. 29.....	+.20	May 26.....	+.41	Sept. 1.....	.90
Jan. 26, 1966.....	.84	June 29.....	.30	Sept. 28.....	1.79
Mar. 22.....	.60				

146-51-14caa3

Oct. 8, 1965.....	12.38	Jan. 26, 1966.....	12.32	June 29, 1966.....	10.41
Nov. 2.....	11.98	Mar. 22.....	11.28	Aug. 2.....	10.27
Nov. 30.....	11.92	April 29.....	10.62	Sept. 1.....	10.98
Dec. 30.....	11.96	May 26.....	10.18	Sept. 29.....	11.38

146-51-24cdd2

June 21, 1966.....	15.37	Aug. 2, 1966.....	15.35	Sept. 29, 1966.....	15.48
June 29.....	15.3	Sept. 1.....	15.53		

146-53-3add

Oct. 8, 1965.....	5.05	Jan. 26, 1966.....	5.46	June 29, 1966.....	2.95
Nov. 2.....	4.4	Mar. 22.....	5.50	Aug. 2.....	3.88
Nov. 30.....	4.49	April 29.....	3.47	Sept. 1.....	4.56
Dec. 29.....	5.11	May 26.....	2.23	Sept. 29.....	4.96

146-53-34aaa

Oct. 7, 1965.....	6.7	Jan. 26, 1966.....	Frozen	June 29, 1966.....	1.0
Nov. 2.....	1.0	Mar. 22.....	Frozen	Aug. 2.....	1.0
Nov. 30.....	Frozen	April 29.....	1.0	Sept. 1.....	1.0
Dec. 29.....	Frozen	May 26.....	1.0	Sept. 29.....	1.0

147-51-16babl

Oct. 18, 1965.....	2.84	Jan. 26, 1966.....	6.21	June 29, 1966.....	2.97
Nov. 2.....	3.15	Mar. 22.....	6.75	Aug. 2.....	3.38
Dec. 1.....	4.05	April 29.....	3.7	Sept. 1.....	4.29
Dec. 30.....	4.55	May 26.....	2.45	Sept. 28.....	4.90

147-51-22bbb

Aug. 17, 1965.....	7.27	Jan. 26, 1966.....	2.73	June 29, 1966.....	1.25
Oct. 4.....	2.62	Mar. 22.....	2.68	Aug. 2.....	1.72
Nov. 2.....	2.33	April 29.....	1.72	Sept. 1.....	1.73
Dec. 1.....	2.37	May 26.....	1.09	Sept. 29.....	1.96
Dec. 30.....	2.44				

Depth to water in feet below land surface

147-51-34ddd1

Date	Water level	Date	Water level	Date	Water level
Oct. 4, 1965.....	11.18	April 8, 1966.....	11.01	June 29, 1966.....	9.70
Nov. 2.....	10.80	April 29.....	10.78	Aug. 2.....	9.86
Nov. 30.....	10.67	May 6.....	10.57	Sept. 1.....	9.91
Dec. 30.....	10.85	May 26.....	10.17	Sept. 29.....	10.0
Jan. 26, 1966.....	11.37				

147-51-34ddd2

Oct. 4, 1965.....	3.62	Mar. 22, 1966.....	Frozen	June 29, 1966.....	1.65
Nov. 2.....	2.85	April 8.....	Frozen	Aug. 2.....	1.65
Nov. 30.....	2.70	April 29.....	1.7	Sept. 1.....	1.60
Dec. 30.....	Frozen	May 6.....	1.7	Sept. 29.....	1.52
Jan. 26, 1966.....	Frozen	May 26.....	1.7		

148-50-15dcc

Aug. 5, 1965.....	3.73	Feb. 2, 1966.....	7.30	June 29, 1966.....	2.57
Oct. 6.....	3.90	Mar. 22.....	5.35	Aug. 2.....	4.33
Nov. 2.....	3.75	April 29.....	.44	Sept. 1.....	4.47
Dec. 1.....	4.35	May 6.....	1.00	Sept. 27.....	5.20
Dec. 30.....	4.95	May 26.....	1.74		

148-51-25dcd

Nov. 3, 1965.....	.53	Mar. 22, 1966.....	0	Aug. 2, 1966.....	.19
Dec. 1.....	.45	April 29.....	0	Sept. 1.....	.21
Dec. 30.....	.15	May 26.....	+.18	Sept. 27.....	.18
Jan. 26, 1966.....	.10	June 29.....	.03		

148-53-7aab

Sept. 10, 1965.....	11.02	Feb. 2, 1966.....	10.27	June 29, 1966.....	8.22
Oct. 5.....	10.22	Feb. 24.....	10.77	July 19.....	8.15
Nov. 2.....	9.52	Mar. 14.....	10.45	Sept. 1.....	8.01
Nov. 30.....	9.48	April 8.....	9.43	Sept. 29.....	8.68
Dec. 29.....	9.65	April 29.....	9.10		
Jan. 26, 1966.....	10.11	May 26.....	8.32		

148-53-7ccc2

June 6, 1966.....	45.42	Aug. 2, 1966.....	45.97	Sept. 29, 1966.....	46.39
June 29.....	45.85	Sept. 1.....	46.06		

148-53-18abd3

Nov. 2, 1965.....	133.61	April 29, 1966.....	131.54	Aug. 2, 1966.....	142.50
Dec. 1.....	132.30	May 26.....	133.60	Sept. 1.....	140.90
Dec. 29.....	130.60	June 29.....	139.14	Sept. 29.....	139.18
Jan. 26, 1966.....	130.65				

Depth to water in feet below land surface

148-53-18acb

Date	Water level	Date	Water level	Date	Water level
July 21, 1965.....	5.55	Dec. 29, 1965.....	6.89	May 26, 1966.....	5.44
Aug. 12.....	6.19	Feb. 2, 1966.....	7.64	June 29.....	5.75
Oct. 4.....	5.77	Mar. 14.....	7.49	Aug. 2.....	5.0
Nov. 2.....	5.95	Mar. 22.....	6.50	Sept. 1.....	5.52
Nov. 30.....	6.49	April 29.....	6.13	Sept. 28.....	6.30

148-53-18adb

July 21, 1965.....	10.75	Dec. 29, 1965.....	Frozen	May 26, 1966.....	10.32
Aug. 12.....	11.47	Feb. 2, 1966.....	Frozen	June 29.....	10.40
Oct. 5.....	11.22	Mar. 14.....	Frozen	Aug. 2.....	10.43
Nov. 2.....	10.81	Mar. 22.....	11.37	Sept. 1.....	10.75
Dec. 1.....	11.19	April 29.....	10.87	Sept. 28.....	11.39

TABLE 3.-- Logs of test holes and selected wells

144-50-30cbb
Test hole 2372

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Clay, silty, moderate-yellow-brown	32	33
	Clay, silty, greenish-gray	37	70
	Gravel and sand, poorly sorted; layers of sandy till	6	76
	Till, sandy, silty, olive-gray to dark-greenish-gray; boulders	56	132
	Clay, dark-greenish-gray to olive-gray, calcareous	34	166
Cretaceous rocks:			
	Shale, olive-gray, calcareous "white specks," hard	12½	178½

144-50-30ccd
Test hole 194

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, silty, brown to orange	41	42

144-50-36abb
Test hole 2539

Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, silty, light-brown to olive-gray, mottled, oxidized	26	28
	Clay, silty, olive-gray to dark-greenish-gray, plastic, cohesive	40	68
	Till, silty, sandy, olive-gray; medium to very coarse sand composed of limestone, quartz, and igneous rocks, shale pebbles, lignite fragments, pyrite, calcareous	52	120
	Till, sandy, silty, light-olive-gray	6	126
	Till, silty, olive-gray to olive-black	12	138
	Till, sandy, light-olive-gray to olive gray	23	161
	Till, clayey, olive-gray	6	167
	Till, gravelly, olive-gray; hard drilling	6	173
	Till, sandy, silty, olive-gray	57	230
	Till, sandy, moderate-brown to yellowish-brown; primarily fine to coarse quartz and sand fragments	15	245
Cretaceous(?) rocks:			
	Sand, fine to coarse, silty and clayey, light-brownish-gray, angular to subrounded quartz	51	296
Precambrian rocks:			
	Clay, silty, varicolored, white, gray, green, brown	34	330
	Clay, silty, moderate-reddish-brown	9	339
	Granite, upper section clayey, dusky-green to greenish-black; lower section, chloritic or ferromagnesian granite, lathlike structure	14	353

144-51-1dcd
Test hole 192

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine, clayey, orange and light-brown	19	20
	Sand, very fine to fine, light-gray	55	75

144-51-2aba
Test hole 2380

Glacial drift:			
	Topsoil, sandy	1	1
	Gravel, sandy, poorly sorted	7	8
	Clay, silty, olive-gray to dark-greenish-gray, calcareous, soft	45	53
	Clay, silty, light-olive-gray	26	79
	Till, silty, olive-gray; occasional boulders	26	105

144-51-12dcc
Test hole 2373

Glacial drift:			
	Topsoil, sandy, black	2	2
	Silt, sandy, yellow-brown, calcareous	19	21
	Silt, clayey, greenish-gray; becomes sandy with depth	21	42
	Sand, fine to coarse, moderate to well-sorted; coarser below 72 feet	58	100
	Gravel, pebbly; fine to coarse sand	22	122
	Sand, fine, clayey, dark-greenish-gray	2	124
	Sand, coarse, poorly sorted	7	131
	Clay, silty, dark-greenish-gray to olive-gray, very calcareous	3	134
	Sand, fine to medium; interbedded dark-greenish-gray clay	43	177
	Clay, silty, sandy, dark-greenish-gray, laminated, calcareous	4	181
	Sand, fine, well-sorted; some clay	6	187
	Clay, silty, dark-greenish-gray to olive-gray, calcareous, hard	10	197
	Sand, fine, well-sorted; some clay	14	211
Cretaceous rocks:			
	Shale, dark-greenish-gray, with "white specks"	20	231

144-51-13dcd
Test hole 193

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine to medium	9	10
	Sand, very fine to fine, silty, brown	15	25
	Sand, very fine to fine, clayey, light-gray	32	57

144-51-36ddd
Test hole 2540

Glacial drift:			
	Topsoil, silty, black	1	1
	Silt, slightly clayey, dark-yellowish-orange	28	29
	Sand, fine, silty and clayey	13	42
	Sand, very fine to medium, angular to subround, mostly quartz with limestone, shale, and igneous rock fragments; more clayey with depth-	41	83
	Till, silty and clayey, olive-gray with numerous rocks; rough drilling	22	105

144-52-1cdc
Test hole 183

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:	Clay (fill material for approach road)----------	6	6
	Clay, smooth, light-brown, plastic, oxidized-----	9	15
	Clay, smooth, gray----------	17	32

144-52-3ccc
Test hole 182

Glacial drift:	Topsoil, sandy, black----------	1	1
	Sand, very fine, very silty and clayey, light-brown, oxidized----------	8	9
	Sand, very fine, clayey, gray----------	13	22

144-52-4ccc
Test hole 179

Glacial drift:	Sand, very fine, silty and clayey, light-brown, oxidized----------	16	16
	Sand, very fine, silty and clayey, light-gray----	6	22

144-52-4dd
Test hole 181

Glacial drift:	Topsoil, sandy, gravelly, black----------	1	1
	Sand, very fine, clayey and silty, light-brown, oxidized----------	6	7
	Sand, very fine, clayey and silty, light-brown and gray----------	27	34
	Clay, smooth, plastic, blue-gray----------	8	42

144-52-5dcd
Test hole 178

Glacial drift:	Sand, very fine, clayey, light-brown, oxidized---	18	18
	Sand, very fine, very silty and clayey, gray-----	9	27

144-52-7abb
Test hole 213

Glacial drift:	Topsoil, black----------	1	1
	Sand, very fine to fine, silty, brown----------	11	12
	Sand, very fine to fine, clayey, olive-gray------	5	17

144-52-7cdd
Test hole 172

Glacial drift:	Sand, fine to medium, silty, brown, oxidized-----	3	3
	Gravel; with fine sand----------	4	7
	Sand, fine, light to gray-brown----------	13	20
	Sand, fine; smooth, plastic, blue-gray clay------	7	27

144-52-9ab
Test hole 180

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Gravel, poorly sorted with fine sand, light-brown	4	5
	Sand, fine to medium, light-brown; more silty and clayey with depth	33	38
	Silt, uniform grains	4	42

144-52-19ccc
Test hole 217

Glacial drift:			
	Topsoil, black	1	1
	Sand, fine to very fine, brown	7	8
	Till, gray	4	12

144-52-19dcc
Test hole 171

Glacial drift:			
	Sand, fine to medium, light-brown, oxidized	4	4
	Gravel, fine	1	5
	Till, sandy, light-brown and gray, oxidized	4	9
	Till, sandy, blue-gray; some large rocks	12	21

144-52-21ccc
Test hole 218

Glacial drift:			
	Topsoil, black	1	1
	Till (?), olive-gray	19	20
	Sand, very fine to fine, clayey, gray	7	27

144-53-1ccc
Test hole 212

Glacial drift:			
	Topsoil	1	1
	Till, sandy, gray, oxidized	14	15
	Sand, very fine to fine, clayey, brown	12	27
	Sand, very fine to fine, clayey, gray	5	3[illegible]

144-53-4bcc
Test hole 2370

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, silty, black	1	1
	Sand, fine to medium	3	4
	Till, clayey, pale to grayish-orange, oxidized	5	9
	Sand, well-sorted, subangular to rounded, oxidized	5	14
	Till, sandy, mottled, calcareous, oxidized	5	19
	Sand, fine to coarse	21	40
	Till, very clayey, olive-gray; interbedded sand	4	44
	Sand, fine to coarse; some gravel	3	47
	Till, very clayey and silty, olive-gray	11	58
	Till, clayey, silty, and sandy, olive-gray, calcareous	108	166
	Till, sandy, gravelly, and bouldery, olive-gray to dark-greenish-gray, calcareous	107	273
	Gravel, fine to medium	4	277
	Till, silty and sandy, olive-gray	26	303
Cretaceous rocks:			
	Clay, silty, olive-black, cohesive, slightly calcareous	33	336

144-53-5ddd
Test hole 210

Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine, brown	4	5
	Sand, very fine to fine, clayey, gray	7	12
	Till, sandy, dark-gray	5	17

144-53-10bbb
Test hole 211

Glacial drift:			
	Topsoil, sandy, brown	1	1
	Sand, very fine to fine, silty, buff to yellow	14	15
	Clay, sandy, brown, oxidized	5	20
	Clay, smooth, gray	12	32

144-53-11ddc1
Test hole 177

Glacial drift:			
	Gravel, poorly sorted; fine to medium, light-brown sand, oxidized	7	7
	Clay, sandy, light-brown to gray	5	12

144-53-11ddc2
Test hole 176

Glacial drift:			
	Sand, fine to medium, clayey and much gravel, oxidized	10	10
	Clay, sandy, light-brown to gray	25	35
	Clay, gray	7	42

144-53-12ccd
Test hole 175

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:	Topsoil, sandy, black	1	1
	Clay, gray	2	3
	Gravel; sand and clay	2	5
	Clay, very sandy, gray to brown	7	12
	Clay, very sandy, blue-gray and gray	15	27

144-53-12cdd
Test hole 174

Glacial drift:			
	Sand, very fine, light-brown; some fine gravel	9	9
	Sand, very fine, clayey, olive-gray	11	20
	Sand, very fine, silty and clayey, light-gray to gray	22	42

144-53-13aab
Test hole 173

Glacial drift:			
	Topsoil, very sandy, black	1	1
	Sand, fine, light-brown, well-sorted	14	15
	Sand, fine; boulders; abandoned hole	2	17

144-53-15cccl
Test hole 169

Glacial drift:			
	Sand, very fine, light-brown, oxidized	10	10
	Sand, very fine, very silty and clayey, blue-gray	37	47
	Clay, smooth, blue-gray, plastic	28	75

144-53-16ccc
Test hole 166

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, smooth, light-brown, oxidized; some sand and gravel	3	4
	Clay, smooth, gray	17	21
	Sand, very fine, silty and clayey (quicksand)	6	27

144-53-16dcc
Test hole 170

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine, light-brown to buff, oxidized	2	3
	Sand, fine to medium, silty, tan	12	15
	Sand, fine, silty and clayey, gray-green	22	37

144-53-17ccd
Test hole 165

Glacial drift:			
	Topsoil, black	1	1
	Till, light-brown, oxidized	11	12
	Sand, very fine, very silty, gray to dark-gray	10	22

144-53-18ddc
Test hole 164

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine to medium, clayey, brown, oxidized	2	3
	Clay, gray; some sand and gravel	10	13
	Sand, fine to medium, silty, gray (quicksand)	19	32
	Sand, very fine to fine, more silty and clayey, gray	55	87

144-53-21ccd
Test hole 167

Glacial drift:			
	Sand, fine to medium, light-brown, clean, oxidized	15	15
	Sand, fine, silty, light-gray (quicksand)	32	47

144-53-22cbb
Test hole 168

Glacial drift:			
	Sand, fine, light-brown, well-sorted, oxidized	8	8
	Sand, fine, silty, gray (quicksand)	7	15
	Clay, smooth, blue-gray	12	27

144-53-23ccc
Test hole 214

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine, brown to orange, oxidized	9	10
	Clay, smooth, light-brown	5	15
	Till, light-gray	7	22
	Clay, gray; fine sand	5	27

144-53-23ddc
Test hole 216

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, fine to medium; fine and coarse sand	3	4
	Sand, fine to coarse, silty	11	15
	Till, clayey, gray; fine to medium sand	2	17
	Till, sandy, gray	8	25
	Sand, very fine to fine, silty, gray (quicksand)	62	87

144-53-23ddd
Test hole 215

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, medium-brown to orange	4	5
	Clay, sandy, brown, oxidized	3	8
	Clay, sandy, olive-gray	4	12
	Sand, very fine to fine, silty, gray	30	42

144-53-28ddd
Test hole 2369

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Till, clayey, gray, calcareous, oxidized	9	10
	Till, silty and sandy, dark-greenish-gray, unoxidized	45	55
	Sand, fine, silty	6	61
	Till, silty and sandy, dark-greenish-gray	109	170
	Gravel, sandy, mostly shale	1	171
	Till, sandy, gravelly, dark-greenish-gray	33	204
	Till, sandy, gravelly, bouldery, olive-gray	102	306
Cretaceous rocks:			
	Clay, olive-gray to dark-greenish-gray; small white inclusions (white specks)	19½	325½

145-49-21cbb
Test hole 2375

Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, silty, mottled, oxidized, calcareous	28	30
	Clay, olive-gray to dark-greenish-gray, calcareous, soft	75	105
	Till, sandy, olive-gray to dark-greenish-gray, very calcareous	21	126
	Gravel, poorly sorted	2	128
	Till, very sandy, dark-greenish-gray to olive-gray; some gravel, calcareous	14	142
	Sand, moderate to well-sorted, quartzose	2	144
	Till, sandy, gravelly, olive-gray	14	158
	Sand, coarse, poorly sorted; some gravel	3	161
	Till, sandy, olive-gray	18	179
	Till, silty, olive-gray to dark-greenish-gray	7	186
	Till, sandy, olive-gray to dark-greenish-gray, moderately hard, very calcareous	95	281
Cretaceous rocks:			
	Sand, medium, well-sorted, mostly subangular	23	304
	Sand, coarse, poorly sorted, subangular to rounded	11	315

145-50-21dad
Test hole 219

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, smooth, light-brown to olive-brown, oxidized	11	12
	Clay, sandy, light-brown, oxidized	13	25
	Clay, sandy, gray	7	32

145-50-22daa
Test hole 220

Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, light-brown, oxidized	11	12
	Clay, sandy, brown, oxidized	18	30
	Sand, very fine to fine, clayey and silty, light-gray	37	67
	Till, gray	5	72

145-50-24aad
Test hole 196

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, light-brown to buff, oxidized	14	15
	Clay, smooth, light-gray	12	27

145-50-24ada
Test hole 195

Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine, clayey, brown	19	20
	Sand, very fine to fine, very clayey, light-gray	20	40
	Clay, smooth, light-gray to gray	12	52

145-50-24add
Test hole 197

Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth to sandy and silty, light-brown, oxidized	19	20
	Clay, smooth, light-gray	22	42

145-50-30cdc
Test hole 191

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, clayey	9	10
	Clay, sandy, brown	15	25
	Sand, very fine to fine, brown	15	40
	Sand, very fine to fine, silty and clayey, light-brown	10	50
	Sand, very fine to fine, light-gray	37	87

145-50-31cdd
Test hole 2374

Glacial drift:			
	Topsoil, silty, black	2	2
	Silt, sandy, clayey, moderate-yellow-brown, oxidized	20	22
	Silt, sandy, clayey, olive-gray, unoxidized	8	30
	Sand, fine to medium, poorly sorted	7	37
	Clay, olive-gray to dark-greenish-gray	5	42
	Sand, fine to medium, poorly sorted	14	56
	Clay, olive-gray to dark-greenish-gray	4	60
	Sand, fine to medium, clayey	10	70
	Clay, silty, sandy, olive-gray to dark-greenish-gray; looks much like till	27	97
	Till, very sandy, dark-greenish-gray and olive-gray, very calcareous; occasional boulders and pockets of oxidized material	70	167
Cretaceous rocks:			
	Shale, olive-gray to dark-greenish-gray, with "white specks"	169	336

145-50-32ccc
Test hole 2381

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, silty, black	1	1
	Clay, silty, dusky-yellow to moderate-yellow-brown, oxidized	28	29
	Clay, silty, olive-gray to dark-greenish-gray; contains pockets of unidentified white material	31	60
	Till, gravelly, sandy, olive-gray to dark-greenish-gray	27	87
	Till, gravelly, hard; some boulders	4	91
	Till, silty, olive-gray; no gravel or boulders	45	136
	Till, very sandy, silty, dark-greenish-gray, highly calcareous	34	170
	Gravel, sandy, poorly sorted	5	175
	Till, silty, sandy, gravelly, dark-greenish-gray	43	218
	Till, clayey, very sandy, olive-gray to dark-greenish-gray, calcareous	23	241
	Sand, fine to medium, silty	4	245
	Till, clayey, sandy, silty, olive-gray	4	249
	Sand, fine to medium, silty	7	256
	Till, clayey, sandy, silty, olive-gray	17	273

145-51-1ddc
Test hole 2379

Glacial drift:			
	Topsoil, black	1	1
	Clay, silty, moderate-yellow-brown	17	18
	Sand, very fine, clayey	12	30
	Sand, fine to medium	42	72
	Sand, fine to medium, poorly sorted	22	94
	Till, silty, olive-gray to dark-greenish-gray	21½	115½

145-51-25abb
Test hole 190

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, clayey, brown	9	10
	Clay, sandy, brown	8	18
	Clay, smooth, light-gray to gray	9	27

145-51-25bbb
Test hole 189

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, fine to coarse	2	3
	Sand, very fine to fine, very clayey	12	15
	Clay, smooth, light-gray to gray	7	22

145-51-36ccd
Test hole 188

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine to coarse; fine and coarse gravel	4	5
	Sand, fine to coarse	12	17
	Clay, smooth, light-brown	3	20
	Clay, smooth, light-gray to blue-gray	67	87

145-51-36dcd
Test hole 187

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine to coarse; fine and coarse gravel	6	7
	Sand, very fine to fine, clayey	5	12
	Clay, sandy, brown	3	15
	Clay, dark-gray to blue-gray	2	17

145-52-20cbc2
Test hole 184

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, smooth, light-brown, oxidized; some fine sand	20	21
	Clay, smooth, gray	6	27

145-52-28aaa
Test hole 185

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, medium, oxidized	3	4
	Clay, light-brown; some fine sand	14	18
	Clay, sandy, gray-green	14	32
	Clay, less sandy, gray-green	5	37

145-52-29bba
Test hole 186

Glacial drift:			
	Topsoil, sandy, black	2	2
	Gravel, fine; fine and coarse sand	3	5
	Clay, gravelly, dark-brown	4	9
	Clay, sandy, light-brown to buff	3	12

145-53-3ccc
Test hole 152

Glacial drift:			
	Topsoil, sandy, gray	2	2
	Sand, fine	8	10
	Clay, sandy, brown	5	15
	Clay, silty and sandy, gray	15	30
	Clay, smooth, gray	7	37

145-53-3ddd
Test hole 156

Glacial drift:			
	Topsoil, sandy	1	1
	Sand, fine, light-brown	4	5
	Clay, smooth, light-brown	13	18
	Clay, gray; fine and medium sand and gravel	7	25
	Clay, smooth, gray	2	27

145-53-4ccd
Test hole 149

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine, clayey, light-brown	9	10
	Sand, very fine, clayey, gray	15	25
	Clay, smooth, gray	12	37

145-53-4cdd2
Test hole 150

Glacial drift:			
	Topsoil, sandy, black; fine sand and gravel	3	3
	Sand, fine, light-brown	22	25
	Sand, very fine, silty and clayey, gray	40	65
	Clay, smooth, gray	22	87

145-53-4ddc
Test hole 151

Glacial drift:			
	Topsoil, sandy, black	3	3
	Sand, fine	2	5
	Clay, sandy, brown to orange	5	10
	Clay, smooth, brown to orange	15	25
	Clay, smooth, gray	12	37

145-53-8abb
Test hole 148

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, light-brown; fine sand and gravel	4	5
	Sand, fine, clayey, light-brown	15	20
	Sand, fine, clayey and silty, gray	17	37

145-53-11aaa
Test hole 154

Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, light- and dark-brown	21	22

145-53-12abb
Test hole 153

Glacial drift:			
	Topsoil, black	1	1
	Clay, dark-brown	9	10
	Clay, smooth, brown to orange	20	30
	Clay, light-gray	35	65

145-53-14bab
Test hole 155

Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, light-brown; thin stringer of gravel	19	20
	Clay, sandy, gray	5	25
	Clay, smooth, gray	2	27

145-53-16baa
Test hole 2371

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, silty, black	1	1
	Sand, fine to medium, oxidized	9	10
	Clay, silty, sandy, dark-greenish-gray, calcareous; more cohesive and plastic with depth	51	61
	Till, sandy, olive-gray to dark-greenish-gray	62	123
	Till, as above; layers of sand and gravel	22	145
	Clay, olive-gray and dark-greenish-gray, calcareous	18	163
	Gravel, poorly sorted, mostly shale	8	171
	Till, olive-gray to dark-greenish-gray, hard; becomes sandy downwards	41	212
	Till, gravelly, light-olive-gray	41	253
Cretaceous rocks:			
	Clay, silty to sandy, olive-gray, fossiliferous laminated, trace of bentonite, calcareous	100	353
	Clay, silty and sandy, light-olive-gray, cohesive, slightly calcareous, moderately soft; stringers of highly calcareous siltstone	46	399
	Clay, sandy, olive-gray, moderately soft	105	504
	Clay, sandy, olive-gray to brownish-gray to dark-yellowish-brown	21	525

145-53-21ccc
Test hole 158

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine, light-brown, oxidized	19	20
	Sand, very fine, silty and clayey, gray	1	21

145-53-21ddc
Test hole 160

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine	2	3
	Sand, very fine to fine, very clayey, tan to buff	7	10
	Clay, sandy, gray to dark-gray; some gravel	10	20
	Sand, very fine to fine, very clayey and silty, gray	2	22

145-53-26bba
Test hole 163

Glacial drift:			
	Sand, fine to very fine, very silty, brown; some gravel	15	15
	Sand, very fine, very silty, dark-brown	5	20
	Sand, very fine to fine, gray	22	42

145-43-27aaa
Test hole 162

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Sand, very fine to fine, clayey, dark-brown; some gravel	2	2
	Clay, sandy, brown to gray	8	10
	Gravel	2	12
	Clay, very sandy, gray	4	16
	Sand, very fine to fine, gray	2	18
	Clay, sandy, gray	19	37

145-53-27abb
Test hole 161

Glacial drift:			
	Clay, slightly gravelly, brown	9	9
	Clay, gray	13	22

145-53-28abb
Test hole 159

Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to medium, brown and dark-brown; some gravel	4	5
	Sand, very fine to fine, clayey, brown	5	10
	Sand, very fine to fine, gray to dark-gray	50	60
	Clay, smooth, light-gray to gray	27	87

145-53-29bba
Test hole 157

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine, light- to dark-brown	7	8
	Clay, sandy, light- to dark-brown, oxidized	7	15
	Clay, olive-gray to gray; fine sand and fine to medium gravel	20	35
	Clay, olive and blue-gray	12	47

145-53-30ccc1
Test hole 223

Glacial drift:			
	Topsoil, black	2	2
	Clay, yellow-brown, mottled; some gravel, oxidized (till)	15	17
	Clay, olive-gray (till)	10	27

145-53-30ccc2
Test hole 224

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, sandy, olive-gray (till)	2	3
	Clay, yellow-brown, oxidized (till)	4	7
	Clay, sandy, olive-gray	20	27

146-49-4bbb
Test hole 2378

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:	Road fill	2	2
	Clay, silty, sandy, yellow-brown, oxidized	20	22
	Clay, silty, olive-gray	102	124
	Till, silty, olive-gray to dark-greenish-gray, hard	41	165
	Clay, sandy, silty, dark-greenish-gray to olive-gray, calcareous, hard	36	201
	Till; boulder	4	205
	Till, sandy, pale-yellowish-brown, very calcareous	45	250
Precambrian rocks:	Clay, silty, sandy, moderate-brown to greenish-gray (weathered granite)	23	273

146-50-1abb
Test hole 2538

Glacial drift:	Topsoil, silty, black	2	2
	Clay, silty, dusky-yellow to pale-olive, oxidized	22	24
	Clay, silty, olive-gray	89	113
	Till, silty and clayey, olive-gray; calcareous shale, limestone, and igneous rock fragments	13	126
	Till, silty and sandy, olive-gray, calcareous; fine to coarse sand fragments; few boulders	66	192
	Till, gravelly, olive-gray, calcareous	5	197
	Till, silty, sandy, olive-gray, very calcareous	48	245
Cretaceous rocks:	Clay, silty, olive-gray, adhesive, plastic, tough	10	255
	Sand, clayey and silty, pale-brown, very calcareous; hard drilling	4	259
	Clay, sandy and silty, pale-brown	5	264
Precambrian(?) rocks:	Clay, silty, grayish-green; interbedded hard sand or limestone stringers; calcareous in fractures or bedding planes; very hard drilling	31	295
	Granite	1	296

146-50-6dde
Test hole 221

Glacial drift:	Topsoil, black	1	1
	Clay, smooth, light-gray to light-brown, oxidized	11	12

146-50-32bad
Test hole 198

Glacial drift:	Topsoil, black	1	1
	Clay, sandy, white to light-gray	2	3
	Clay, smooth, light-brown to buff, oxidized	14	17

146-51-3ddc
Test hole 1330

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	2	2
	Clay, sandy, yellow	19	21
	Clay, smooth, blue	24	45
	Sand, fine, medium, and coarse; about 25 percent shale grains	34	79
	Gravel, fine and medium; last 10 feet cemented and contains cobblestones; abandoned	26	105

146-51-24cdd2
Test hole 2541

Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, silty, dark-yellowish to moderate-yellowish-brown	9	11
	Sand, fine to coarse; predominantly quartz with a lot of shale grains	33	44
	Sand, coarse to very coarse; quartz, shale, limestone, and igneous rock fragments	6	50
	Sand, fine, medium, coarse; finer grain and more clayey with depth	44	94
	Till, gravelly, bouldery, olive-gray	11	105

146-52-31bbb
Test hole 147

Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, dark-brown, oxidized; some rock fragments	19	20
	Clay, smooth, light-brown	17	37

146-53-2dcc
Test hole 102

Glacial drift:			
	Topsoil, black	2	2
	Clay, olive-gray	5	7
	Clay, brownish-gray	3	10
	Clay, light-brownish-gray, plastic	10	20
	Clay, smooth, brownish-gray	5	25
	Clay, silty, olive-gray	57	82
	Till, gray	5	87

146-53-2ddc
Test hole 101

Glacial drift:			
	Topsoil, black	2	2
	Clay, smooth, yellow to brown, oxidized	20	22
	Clay, smooth, gray	15	37

146-53-28ccc
Test hole 208

Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine, clayey, dark-brown	11	12
	Sand, very fine to fine, silty, olive-brown	8	20
	Clay, sandy, light-gray	12	32

146-53-28ddc3
Test hole 143

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, light-brown to buff, oxidized	14	15
	Clay, smooth, gray	2	17

146-53-32bbb
Test hole 209

Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine	9	10
	Sand, very fine to fine, silty, light-brown	10	20
	Sand, very fine to fine, silty, light-gray	22	42

146-53-35baa
Test hole 146

Glacial drift:			
	Topsoil, black	1	1
	Till, dark-brown	23	24
	Sand, very fine to fine, clayey, dark-brown	8	32
	Sand, fine to coarse, clayey, gray	5	37

146-53-35bad
Test hole 145

Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine, clayey, light-brown	19	20
	Sand, very fine to fine, very clayey, dark-brown	10	30
	Sand, very fine to fine, gray (all quicksand)	7	37

146-53-35bbb
Test hole 144

Glacial drift:			
	Topsoil, black	1	1
	Clay, yellow to light-gray, mottled	24	25
	Clay, very sandy, dark-brown to gray	40	65
	Clay, sandy, gray	15	80
	Till, gray	7	87

147-50-5bbb
Test hole 203

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine to coarse	9	10
	Clay, smooth, gray	2	12

147-50-10aaa
Test hole 202

Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine, silty and clayey, light-brown	19	20
	Clay, smooth, light-gray	2	22

147-50-14ccc
Test hole 201

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, silty, light-brown to buff	11	12
	Sand, very fine to fine, buff to light-gray; more clayey with depth	13	25
	Clay, smooth, light-gray	5	30

147-50-17cbc
Test hole 200

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, silty, light-brown	11	12
	Sand, very fine to fine, clayey, light-gray	5	17
	Clay, smooth, light-gray	5	22

147-50-17ccb
Test hole 199

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, fine to coarse	2	3
	Sand, very fine to coarse; fine gravel	12	15
	Clay, smooth, gray	12	27

147-50-18dda
Test hole 222

Glacial drift:			
	Clay, very silty and somewhat sandy, light-gray	7	7
	Clay, olive-gray, plastic; small coarse sand size limestone inclusions	15	22
	Clay, smooth, olive-gray, plastic	90	112

147-50-33ddd
Test hole 2377

Glacial drift:			
	Topsoil, black	1	1
	Clay, silty, yellow-brown to dusky-yellow	19	20
	Clay, olive-gray to dark-greenish-gray	42	62
	Till, sandy, olive-gray to dark-greenish-gray, calcareous	34	96
	Till, sandy, olive-gray; occasional boulders	64	160
	Sand, fine to coarse, poorly sorted	8	168
	Silt, sandy, olive-gray	4	172
	Till, gravelly, light-olive-gray	34	206
	Sand, fine to coarse, gravelly; interbedded till-	20	226
Cretaceous rocks:			
	Clay, silty, dark-greenish-gray, slightly calcareous	49	275
Precambrian rocks:			
	Granite	1	276

147-51-1bbb
Test hole 1969

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, silty, black	1	1
	Till, silty, mottled yellowish-gray and brown; some fine limestone, gravel, and coal fragments	13	14
	Till, silty, olive-gray; small amount of limestone sand grains	47	61
	Till, silty, light-olive-gray; fine sand fraction of limestone with occasional limestone boulder	33	94
	Till, olive-gray to medium-dark-gray; sand to granule gravel size limestone fragments	40	134
	Till, silty, dark-gray; less sand than above	13	147
	Till, medium to dark-gray; coarse sand and fine gravel size limestone and shale fraction with cobbles and boulders	11	158
	Till, silty, dark-gray to light-olive-gray; mottled with white calcareous spots lower 5 feet	16	174
Cretaceous rocks:			
	Clay, smooth, greenigh-gray to light-olive-gray; very calcareous, tough	36	210

147-51-6dad
Test hole 132

Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine, brown to dark-brown	4	5
	Clay, sandy, brown to yellow	15	20
	Clay, smooth, gray	2	22

147-51-6dda
Test hole 131

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to coarse; fine and medium gravel, clean	9	10
	Sand, very fine to fine, brown to dark-brown	10	20
	Clay, gray, smooth	2	22

147-51-6ddd
Test hole 133

Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine, tan to brown; more clayey with depth	9	10
	Clay, smooth, brown to blue	5	15
	Clay, smooth, gray	5	20

147-51-14bcb
Test hole 1976

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, silty and sandy, black	1	1
	Till or clay, silty, light-gray, yellowish-brown, dark-brown, mottled, oxidized; fine to coarse quartz and limestone sand	19	20
	Clay, silty, olive-gray; few very fine quartz sand grains	64	84
	Till, silty and sandy, olive-gray; fine to medium quartz sand and limestone grains	16	100
	Till, silty, olive-gray, tough; shale pebbles and fine to coarse limestone fraction	52	152
	Till, silty, dark-olive-gray; fine to coarse shale, quartz, and limestone sand	18	170
	Abandoned at 170 feet; granite boulder.		

147-51-22bbb
Test hole 2382

Glacial drift:			
	Topsoil, silty, black	1	1
	Clay, pale-olive to dark-yellow-orange, oxidized, very calcareous, soft	10	11
	Clay, olive-gray to dark-greenish-gray	23	34
	Till, clayey, dark-greenish-gray to olive-gray	10	44
	Sand, medium, well-sorted, angular to subangular	63	107
	Till, olive-gray to dark-greenish-gray	10	117
	Sand, medium, moderately well-sorted	8	125
	Till, bouldery	6	131
	Hole abandoned.		

147-51-27ddd1
Test hole 1331

Glacial drift:			
	Topsoil, black	2	2
	Clay, yellow	5	7
	Sand, fine, medium, and coarse	88	95
	Lost circulation at 95 feet; abandoned.		

147-51-34ddd
Test hole 2376

Glacial drift:			
	Topsoil, black	1	1
	Clay, grayish-orange to dark-yellowish-orange, oxidized, calcareous, soft	3	4
	Sand, medium, moderately well-sorted, oxidized	24	28
	Sand, medium, moderately well-sorted, unoxidized; shale fraction increases downward	98	126
	Sand, coarse to very coarse, some gravel	10	136
	Till, olive-gray to dark-greenish-gray	62	198
	Sand, coarse to very coarse; some gravel	12	210
Cretaceous rocks:			
	Clay, dark-greenish-gray, cohesive, soft	21	231

147-52-21dcd
Test hole 142

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine, tan	2	3
	Clay, smooth, brown, orange, gray, mottled and oxidized	15	18
	Clay, smooth, gray	2	20

147-53-3ddc
Test hole 106

Glacial drift:			
	Topsoil, black	1	1
	Sand, fine, brown to orange; more clayey with depth	14	15
	Clay, smooth, light-gray to dull-brown	8	23

147-53-9cdd2
Test hole 104

Glacial drift:			
	Topsoil, sandy, black	2	2
	Sand, very fine, clayey, brownish-orange to brown	14	16
	Clay, sandy, very silty, brown to gray	6	22
	Clay, silty and sandy, gray; cohesive and smooth with depth	30	52

147-53-9dcc
Test hole 105

Glacial drift:			
	Topsoil, sandy, black	2	2
	Sand, fine, clayey, brown	7	9
	Clay, sandy to smooth, brown	7	16
	Clay, smooth, gray	1	17

147-53-24cdc
Test hole 103

Glacial drift:			
	Topsoil, black	2	2
	Clay, brown, mottled, oxidized	10	12
	Clay, smooth, brown to brownish-gray	20	32
	Clay, smooth, olive-gray	10	42

148-49-8bbb
Test hole 2384

Glacial drift:			
	Topsoil, black	2	2
	Clay, silty, sandy, dark-yellow-orange to pale- and light-olive-gray, oxidized	17	19
	Clay, olive-gray to dark-greenish-gray, slightly calcareous, soft	130	149
	Sand, fine to coarse; some gravel	3	152
	Till, silty, sandy, gravelly, olive-gray to dark-greenish-gray; occasional boulders	21	173
	Till(?), very sandy, olive-gray	58	231

148-49-8ddd2
Test hole 1323A

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, yellow	15	16
	Clay, silty and sandy, blue; lost circulation, no sand samples (apparently interbedded silts and sands)	152	168
	Till, gray; fine and medium limestone gravel and cobbles (rough drilling); more gravel at 238 feet	74	242
Cretaceous rocks:			
	Clay, light-gray	20	262
Precambrian(?) rocks:			
	Granite	½	262+

148-49-9dcd2
Mrs. Ole Asmodt
(Log furnished by Carl Larson)

Glacial drift:			
	Topsoil, black	2	2
	Clay, yellow	15	17
	Clay, blue	103	120
	Clay or till, gray, soft	45	165
	Till, gray; rocks; hard drilling	29	194
	Gravel; medium and coarse sand	16	210

148-49-15baa
Test hole 1329

Glacial drift:			
	Topsoil, black	2	2
	Clay, smooth, yellow	19	21
	Clay, silty and sandy, gray	121	142

148-49-17aaa2
Test hole 1323

Glacial drift:			
	Topsoil, black	2	2
	Clay, smooth, yellow	12	14
	Clay, smooth, blue; apparently sandy; lost circulation at 15 feet, mixed mud; abandoned at 63 feet	49	63

148-49-17bbb
Test hole 1325

Glacial drift:			
	Topsoil, silty, black	4	4
	Clay, smooth, yellow	13	17
	Clay, silty, gray	137	154
	Till, gray	61	215

148-49-18bbb
Test hole 1322

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, silty, black	1	1
	Clay, smooth, yellow	14	15
	Clay, silty, blue	99	114
	Clay, smooth, gray	6	120
	Till, gray	38	158
	Gravel, fine, medium, and coarse; some boulders (could be very gravelly till)	72	230

148-49-18ccc
Test hole 1327

Glacial drift:			
	Topsoil, black	2	2
	Clay, smooth, yellow	10	12
	Clay, smooth, gray	122	134
	Gravel, fine to medium, dirty	5	139
	Till, gray	9	148
	Gravel, fine, medium, and coarse; cemented from 191 to 225; hit granite rock and abandoned hole	77	225

148-50-1ddd
Test hole 1326

Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, smooth, yellow	14	16
	Clay, silty and sandy, gray	126	142
	Till, gray	26½	168½

148-50-13cccl
Test hole 2383

Glacial drift:			
	Topsoil, black	1	1
	Clay, silty, dusky-yellow, pale-yellowish-brown, light-olive-gray to pale-olive-gray, oxidized	20	21
	Clay, dark-greenish-gray; contains pockets of unidentified white material	101	122
	Clay, dark-greenish-gray; few fine to medium sand size dolomite fragments	16	138
	Till, sandy, silty, olive-gray, dark-greenish-gray; gravel stringers, boulders, calcareous	52	190
	Till(?), very sandy, light-olive-gray, very calcareous	14	204
	Till(?), sandy, dark-yellowish-brown to light-olive-gray, very calcareous (oxidized?)	17	221
	Till(?), silty, olive-gray, calcareous, hard	33	254
Cretaceous rocks:			
	Clay, silty, olive-gray, calcareous	6	260
	Sand, medium to coarse, subangular to subrounded quartzose; some light-brown to pale-purple clay	23½	283½

148-50-13ccc2
Test hole 2537

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, silty, dusky-yellow, mottled, oxidized, soft	19	21
	Clay, silty, olive-gray to dark-greenish-gray	14	35
	Till, silty, clayey, olive-gray to dark-greenish-gray; sand and gravel size igneous, domomite limestone and shale fragments	80	115
	Till, sandy, silty, light-greenish- and yellowish-gray; limestone and shale rock fragments	10	125
	Till, sandy, silty, olive-gray, plastic	13	138
	Till, gravelly, olive-gray	19	157
	Gravel, granules and pebbles; limestone, igneous, and shale fragments	4	161
	Till, silty, sandy, and gravelly, olive-gray to dark-greenish-gray	19	180
	Gravel; many rocks	8	188
	Till, sandy, gravelly, olive-gray	11	199
	Till, silty, sandy, pale-brown to light-brownish-gray	6	205
	Till, silty, sandy, olive-gray	20	225
	Till, sandy, light to light-olive-gray and light-brownish-gray	29	254
Cretaceous rocks:			
	Clay, silty, light-olive-gray to olive-gray; hard drilling	6	260
	Clay, silty, sandy, pale-brown to light-brownish-gray	21	281
	Clay, silty, sandy, white, light-gray, light-greenish-gray and blueish-gray; fine to coarse angular to subrounded sand; light-brown siderite(?) pellets; most of clay looks micaceous; jetted mud pit at 315 feet	39	320
	Clay, silty, sandy, light-gray to light-greenish-gray; more sandy than above	27	347
Precambrian rocks:			
	Clay, sandy, silty, white to greenish-gray; few chips of chlorite schist (weathered metamorphic rock ?)	42½	389½
	Granite; few rock chips of dark-green, black, rock containing quartz	½	390

148-50-15bbc
Test hole 2387

Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, silty, mottled, oxidized, calcareous	16	18
	Clay, silty, olive-gray	24	42

148-50-15cdd
Test hole 2385

Glacial drift:			
	Topsoil, black	2	2
	Clay, silty, dark- to moderate-yellow-brown, oxidized	8	10
	Gravel, granule; fine to coarse sand	3	13
	Clay, silty, medium- to dark-olive-gray	19	42

148-50-17bbb
Test hole 207

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Sand, very fine to fine, clayey, brown	4	5
	Clay, smooth, brown, oxidized	2	7
	Till, light-brown to light-gray, oxidized	15	22

148-50-20abb
Test hole 2388

Glacial drift:			
	Topsoil, silty, black	2	2
	Till, silty, yellowish-brown, mottled, oxidized, calcareous	16	18
	Till, silty, olive-gray to greenish-gray	45	63

148-50-20ccc
Test hole 1963

Glacial drift:			
	Topsoil, silty, black	1	1
	Clay, silty, grayish-yellow	4	5
	Till, silty to sandy, dark-yellowish-orange; shale and limestone pebbles, oxidized	10	15
	Till, as above, olive-gray	94	109
	Till, silty to sandy, olive-gray, tough; coarser texture than above	35	144
	Gravel, fine to coarse, subangular to subrounded limestone fragments	2	146
	Till, light-olive-gray; abundant fine to medium limestone gravel	64	210

148-50-22ada
Test hole 2386

Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, silty, pale-yellowish-brown to light-brown, mottled, oxidized, calcareous	5	7
	Sand, fine to coarse, oxidized; coarse sand and some granules from 11 to 13 feet; thin float zone at base	9	16
	Clay, silty, sandy, olive-gray	27	43

148-50-24ddd
Test hole 1328

Glacial drift:			
	Topsoil, black	2	2
	Clay, smooth, yellow	12	14
	Clay, smooth, gray	128	142
	Till, gray	13	155
	Sand, coarse; some fine gravel	11	166
	Till, gray (abandoned)	23	189

148-51-23ccb
Test hole 206

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Gravel, fine to coarse; fine and coarse sand	14	15
	Sand, very fine to fine, brown	5	20
	Sand, very fine to fine, clayey, gray	5	25
	Clay, smooth, gray	2	27

148-51-24aad2
Test hole 204

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, light-brown to light-gray; more clayey with depth	19	20
	Clay, smooth, gray	2	22

148-51-29ccc
Test hole 129

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, fine; fine and coarse sand	2	3
	Clay, sandy, light-brown to yellow, mottled	9	12
	Clay, gray, mottled	30	42

148-51-33ccb
Test hole 130

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, fine to coarse; fine and coarse sand	14	15
	Sand, fine to coarse; more clayey with depth	7	22
	Clay, smooth, gray	5	27

148-51-36bbb3
Test hole 205

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, fine to coarse; fine and coarse sand	5	6
	Sand, fine to coarse, light-gray; more silty and clayey with depth	24	30
	Clay, smooth, light-gray	2	32

148-52-1ccd
Test hole 120

Glacial drift:			
	Topsoil, sandy, gravelly, black	1	1
	Sand, fine to coarse; fine and medium gravel	13	14
	Sand, as above; more clayey	6	20
	Clay, sandy, gray	5	25
	Clay, smooth, gray	2	27

148-52-1cdc
Test hole 121

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, sandy, gravelly, black	1	1
	Sand, fine to coarse; fine and medium gravel; clayey with depth	12	13
	Clay, smooth, gray	2	15

148-52-1ddd
Test hole 122

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine to coarse; fine and coarse gravel	4	5
	Sand, fine to coarse, brown; more clayey with depth	15	20
	Clay, smooth, gray	2	22

148-52-8cdd
Test hole 112

Glacial drift:			
	Topsoil, sandy, black	2	2
	Sand, very fine to fine, clayey, brown	8	10
	Clay, sandy, dark-brown	15	25
	Clay, smooth, gray	12	37

148-52-9add
Test hole 117

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, fine to coarse; fine and coarse sand	11	12
	Sand, fine to coarse, clean	10	22
	Sand, fine to medium, gray; silty and clayey with depth	8	30
	Clay, smooth, gray	2	32

148-52-9dda
Test hole 116

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, fine to coarse	2	3
	Sand, fine to coarse, brown to yellow	17	20
	Sand, very fine to fine, silty and clayey, gray	5	25
	Clay, smooth, gray	2	27

148-52-13aaa
Test hole 1191

Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, smooth, yellow	15	17
	Clay, smooth, blue	51	68
	Clay, sandy, silty, gray	34	102
	Sand, fine to coarse	2	104
	Till, gray; shale pebbles	11	115
Cretaceous rocks:			
	Shale	11	126

148-52-13bbb
Test hole 123

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, yellow to brown, mottled, oxidized	8	9
	Clay, smooth, dark-brown to light-brown	18	27
	Clay, smooth, gray	5	32

148-52-13bbc
Test hole 124

Glacial drift:			
	Topsoil, sandy, black	1	1
	Gravel, fine to medium; fine and coarse sand	4	5
	Sand, fine to coarse; some gravel	9	14
	Sand, fine to coarse, clayey	11	25
	Clay, smooth, gray	2	27

148-52-13bcc
Test hole 125

Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, mottled yellow to light-gray, oxidized	11	12

148-52-13dcd
Test hole 127

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine to coarse; fine gravel	4	5
	Sand, very fine to fine; more clayey with depth	17	22
	Clay, sandy, gray	10	32

148-52-14bbb2
Test hole 1190

Glacial drift:			
	Clay, smooth, yellow	5	5
	Clay, smooth, gray	16	21
	Clay, smooth, blue	84	105
	Till, gray; shale pebbles	39	144
	Gravel, fine to coarse	6	150
	Till, gray; shale pebbles	60	210
Cretaceous rocks:			
	Shale	10	220

148-52-14dcc
Test hole 126

Glacial drift:			
	Topsoil, black	1	1
	Gravel, fine to coarse	9	10
	Clay, smooth, mottled gray and brown	2	12

148-52-15baa
Test hole 115

eologic source	Material	Thickness (feet)	Depth (feet)
lacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, tan to brown	9	10
	Sand, very fine to medium, clayey, gray, dirty	15	25
	Clay, smooth, gray	2	27

148-52-15bab
Test hole 2389

acial drift:			
	Topsoil, sandy, black	1	1
	Gravel, granules to pebbles; fine to coarse sand	9	10
	Till, silty, olive-gray to dark-greenish-gray, calcareous	42½	52½

148-52-15bba
Test hole 114

acial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine to coarse	2	3
	Gravel, fine to coarse; fine to coarse sand	4	7
	Sand, fine to coarse	5	12
	Sand, very fine to fine, gray; more silty and clayey below 20 ft	20	32
	Clay, smooth, gray	5	37

148-52-16daa
Test hole 118

acial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine to coarse; some gravel	8	9
	Clay, smooth, gray	3	12

148-52-22baa
Test hole 119

cial drift:			
	Topsoil, sandy, black	2	2
	Sand, very fine to fine, clayey	2	4
	Clay, sandy, brown, mottled, oxidized	4	8
	Clay, smooth, gray	2	10

148-52-24aaa
Test hole 128

cial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to medium, clayey, brown to dark-brown	8	9
	Clay, sandy, gray	5	14
	Clay, smooth, gray	3	17

148-52-29ccc
Test hole 140

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	1	1
	Clay, sandy, yellow to brown, mottled	11	12
	Clay, smooth, light-brown to gray	10	22

148-52-29cdd
Test hole 141

Glacial drift:			
	Topsoil, black	1	1
	Clay, smooth, yellow to light-brown, oxidized, mottled	14	15
	Clay, smooth, gray	5	20

148-53-5aba
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Glacial drift:			
	Topsoil, black	1	1
	Silt, clayey, moderate-yellowish-brown	17	18
	Silt, clayey, olive-gray, laminated	86	104
	Till, clayey, olive-gray, cohesive	9	113
	Till, gravelly, olive-gray, mostly shale and dolomite fragments	43	156
	Till, olive-gray, very hard, cohesive	31	187
Cretaceous rocks:			
	Clay, silty, olive-gray, contains "white specks"-	23	210

148-53-5bcb
Test hole 1975

Glacial drift:			
	Topsoil, black	1	1
	Sand, very silty, very fine, yellowish- to moderate-brown	17	18
	Silt, sandy, olive-gray; more clayey with depth--	56	74
	Silt, olive-gray; few limestone and sand grains	31	105
	Clay, olive-gray and brownish-gray, cohesive	17	122
	Till, silty, olive-gray; fine sand, granule gravel and shale pebbles	15	137
	Till, silty, dark-olive-gray, as above	52	189
	Till, olive-gray; limestone, shale, and granite pebbles abundant	9	198
Cretaceous rocks:			
	Clay, olive-gray, cohesive and tough (till?)	12	210

148-53-7aab
Test hole 2390

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, fine	3	4
	Clay, silty, dark-yellow-orange to pale-olive, calcareous, oxidized	4	8
	Silt, clayey, moderate-yellow-brown, laminated, calcareous, oxidized	4	12
	Silt, sandy, clayey, olive-gray to dusky-yellow-green, unoxidized	30	42

148-53-7ccc2
North Dakota State Water Commission 762-14

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, silty, black	2	2
	Clay, silty, grayish-orange	13	15
	Silt, clayey, dark-greenish-gray	78	93
	Till, olive-gray	83	176
	Gravel, coarse, sandy, poorly sorted, mostly shale pebbles	3	179
	Till, gravelly, olive-gray	24	203
Cretaceous rocks:			
	Shale, olive-gray, calcareous	17½	220½

148-53-7cdd
Dean Osking and Co.
(Log furnished by Frederickson's Inc.)

Glacial drift:			
	Topsoil	2	2
	Clay, silty, yellow, soft	16	18
	Clay, sandy, blue, soft	93	111
	Sand, colored	2	113
	Clay, sandy, blue, hard (till)	74	187
	Sand, fine, gray	10	197
	Clay, sandy, blue, hard	12	209
Cretaceous rocks:			
	Shale, black	128	337
	Sand, fine; interbedded black shale	79	416
	Shale, sandy, gray; lenses of sandstone	12	428
	Shale, gray, hard	8	436
	Shale, brown, hard	17	453
	Shale, varicolored	8	461
	Sandstone, whitish	22	483
	Shale, black, hard	5	488
	Sandstone, gray	7	495
	Shale, blue, hard	12	507

148-53-7ddd
North Dakota State Water Commission 762-12

Glacial drift:			
	Topsoil, black	1	1
	Clay, silty, dusky-yellow, oxidized; interbedded with fine sand	9	10
	Clay, silty, dusky-yellow	8	18
	Silt, clayey, dark-greenish-gray to olive-gray	84	102
	Till, silty, sandy, dark-greenish-gray to olive-gray	63	165
	Sand, gravelly, poorly sorted	3½	168½
	Till, silty, sandy, dark-greenish-gray to olive-gray	18½	187
	Clay, sandy, "salt and pepper look," moderately soft; wood fragments and lignite	22	209
	Sand, poor sample	1	210
Cretaceous rocks:			
	Shale, olive-gray with "white specks"	38	248
	Limestone, or limey siltstone, olive-gray, highly calcareous	1	249
	Shale, olive-gray	3	252

148-53-8abb
Test hole 1971

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, silty and sandy, black	1	1
	Clay, silty, light-yellow to dark-brown, mottled, oxidized	17	18
	Sand, very fine to fine, very silty; brown to gray with depth	23	41
	Clay, very silty, greenish-gray to olive-gray; very fine sand grains	64	105
	Clay, olive-gray to yellowish-light-brown; sediments contain nodular stem sections indicating possible soil or float zone	24	130
	Till, silty, olive-gray; shale and limestone gravel	57	187
	Clay, dark-gray; few fine sand size limestone grains and shale pebbles	23	210

148-53-8bba
Test hole 1973

Glacial drift:			
	Topsoil, silty, dark-brown	1	1
	Silt, clayey and sandy, yellow to pale-olive	17	18
	Silt, clayey, slightly sandy, light-olive-gray	45	63
	Clay, silty, slightly sandy, light-olive-gray to olive-gray	52	115
	Till, silty, olive-gray; limestone and shale particles	20	135
	Till, sandy to gravelly, olive-gray; limestone and shale pebbles with some wood fragments	65	200

148-53-8bbb
Test hole 1972

Glacial drift:			
	Topsoil, sandy, dark-brown	2	2
	Silt, sandy, dusky-yellow to light-olive-gray	14	16
	Sand, very fine, very silty, moderate-yellow and light-olive-gray	16	32
	Silt, sandy and clayey, light-olive-gray to olive-gray	52	84
	Clay, very silty, light-olive-gray	26	110
	Till, silty and sandy; limestone and shale fragments	70	180
	Till, olive-gray; abundant limestone and shale gravel	20	200
	Till, silty, dark-gray; limestone and shale pebbles	10	210

148-53-8cca
Olaf Bye
(Log furnished by Frederickson's Inc.)

Glacial drift:			
	Topsoil, black	2	2
	Clay, yellow, oxidized	19	21
	Clay, silty, blue	14	35
	Clay, silty, very soft	80	115
	Clay, sandy, blue	6	121
	Till, sandy, blue; limestone boulder	14	135
	Till, sandy, blue; boulders	41	176
	Till, sandy, blue	9	185
	Sand, gray	10	195
	Sand, and coal	7	202
Cretaceous rocks			
	Shale, blue	5	207

148-53-8daa
Test hole 1974

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, sandy, dark-brown	1	1
	Silt, clayey and sandy, dusky to moderately-yellow	17	18
	Silt, sandy, light-olive-gray to olive-gray; more clayey with depth	82	100
	Clay, silty, and somewhat sandy, olive-gray	24	124
	Till, sandy, olive-gray; shale and limestone pebbles	18	142
	Till, dark-gray and olive-gray; shale pebbles and limestone boulders	23	165
	Till, sandy and gravelly, olive-gray	24	189
	Till, dark-olive-gray; limestone and shale pebbles	21	210
Cretaceous(?) rocks:			
	Clay, very dark-gray, with white calcareous spots, compact, tough	10	220

148-53-10dcd
Gail Rye
(Log furnished by Frederickson's Inc.)

Glacial drift:			
	Topsoil, black	1	1
	Clay, yellow, oxidized	4	5
	Sand, fine, brown	2	7
	Clay, yellow, oxidized	9	16
	Sand, fine, silty blue clay	19	35
	Shale, silty, blue, soft	91	126
	Till, sandy, blue, hard	30	156
	Till, sandy, blue, soft	14	170
	Sand, gray, clean	3	173
	Till, sandy, hard	19	192
	Till, sandy, soft	43	235
	Till, sandy, hard	21	256
Cretaceous(?) rocks:			
	Shale, blue	11	267

148-53-13abb
Test hole 111

Glacial drift:			
	Topsoil, sandy, black	2	2
	Sand, very fine to fine, brown	10	12
	Sand, very fine to fine, clayey, brown	5	17
	Clay, smooth, gray	5	22

148-53-13baa
Test hole 110

Glacial drift:			
	Topsoil, black	2	2
	Sand, very fine to fine, buff to yellow	8	10
	Sand, very fine to fine, yellow to gray; clayey at 27 ft	20	30
	Clay, smooth, gray	2	32

148-53-13bba
Test hole 109

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black	2	2
	Sand, very fine to fine, buff and yellow	10	12
	Sand, very fine to fine, gray	13	25
	Clay, smooth, gray	2	27

148-53-13bbb
Test hole 113

Glacial drift:			
	Topsoil, sandy, black	2	2
	Sand, very fine to fine, dark-brown	13	15
	Clay, smooth, gray	7	22

148-53-18abb2
North Dakota State Water Commission 762-1

Glacial drift:			
	Topsoil, sandy, black	1	1
	Clay, silty, moderate-yellowish-brown	14	15
	Clay, silty, olive-gray	77	92
	Till, clayey, olive-gray to dark-greenish-gray	22	114
	Gravel, shaly, poorly sorted; some coarse sand	5	119
	Till, sandy, dark-greenish-gray to olive-green, cohesive, calcareous	67	186
	Silt, sandy, clayey, olive-gray, highly calcareous, laminated	65	251
	Granite boulder	2	253
	Silt, sandy, clayey, olive-gray	10	263
Cretaceous rocks:			
	Shale, olive-gray, contains "white specks," cohesive, calcareous, hard	10	273

148-53-18abb3
North Dakota State Water Commission 762-4

Glacial drift:			
	Topsoil, silty, black	1	1
	Silt, clayey, olive-gray to dark-greenish-gray	95	96
	Till, sandy, silty, clayey, dark-greenish-gray; becomes gravelly at 116 ft	65	161
	Sand, fine to medium	2	163
	Till, clayey, dark-greenish-gray and olive-gray, cohesive, hard	13	176
	Gravel, sandy and shaly	2	178
	Silt, clayey and sandy, olive-green, highly calcareous	8	186
	Clay, silty, olive-green; occasional fine white sand in form of laminations, highly calcareous	64	250
	Gravel, moderately well-sorted, mostly fragments of dolomite	6	256
Cretaceous rocks:			
	Clay, silty, sandy, olive-gray with "white specks," calcareous	17	273

148-53-18abd3
North Dakota State Water Commission 762-2

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Clay, gravelly, black (road fill)----------	1	1
	Clay, silty, sandy, moderate-yellowish-brown to dark-yellowish-brown, oxidized----------	20	21
	Silt, clayey, olive-gray, laminated----------	81	102
	Till, silty and sandy, olive-gray to dark-greenish-gray; numerous shale pebbles----------	27	129
	Gravel, sandy, poorly sorted; shale, limestone, and igneous rock fragments----------	4	133
	Till, silty, sandy, gravelly, olive-gray to olive-black; shale pebbles and limestone fragments----------	129	262
	Gravel, sandy, angular to rounded, poorly sorted; shale, limestone, and igneous rock fragments---	17	279
Cretaceous rocks:			
	Shale, sandy, with "white specks," cohesive, hard----------	25½	304½

148-53-21aaa
North Dakota State Water Commission 762-7

Glacial drift:			
	Topsoil, silty, black----------	1	1
	Sand, clayey, moderate-yellowish-brown----------	9	10
	Clay, silty, dark-greenish-gray----------	117	127
	Till, silty, sandy, greenish-gray; some gravel layers----------	8	135
	Till, silty, clayey, olive-gray; no gravel-------	11	146
	Till, clayey, gravelly, bouldery----------	79	225
Cretaceous rocks:			
	Clay, contains "white specks," cohesive, hard----	27	252

148-53-21ddc
Test hole 136

Glacial drift:			
	Topsoil, sandy, brown----------	1	1
	Sand, very fine to fine, silty, brown----------	22	23
	Clay, smooth, gray----------	4	27

148-53-23cdc
Test hole 137

Glacial drift:			
	Topsoil, sandy, brown----------	1	1
	Sand, very fine to fine, brown----------	4	5
	Sand, very fine to fine, clayey----------	8	13
	Clay, sandy, brown to gray----------	5	18
	Clay, smooth, light-brown to gray----------	4	22

148-53-23ddd
Test hole 138

Glacial drift:			
	Topsoil, sandy, brown----------	1	1
	Sand, very fine to fine, silty and clayey, brown-	14	15
	Sand, very fine to fine, silty and clayey, gray--	10	25
	Clay, smooth, gray----------	2	27

148-53-25aaa
Test hole 139

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, brown to orange	14	15
	Sand, very fine to fine, silty and clayey, brown to gray	10	25
	Clay, smooth, gray	2	27

148-53-28ddd
Test hole 135

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, silty and clayey, brown, light-brown, gray	19	20
	Clay, sandy to silty, gray to light-gray	25	45
	Clay, smooth, gray to olive-gray	42	87

148-53-29ccd
Test hole 108

Glacial drift:			
	Topsoil, sandy, black	1	1
	Sand, very fine to fine, silty, dark-brown to gray	14	15
	Clay, sandy and silty, dark-brown to gray	7	22
	Clay, silty, olive-gray	10	32

148-53-30ccc
North Dakota State Water Commission 762-8

Glacial drift:			
	Topsoil, black	1	1
	Clay, grayish-orange, oxidized	9	10
	Silt, clayey, grayish-orange, oxidized	7	17
	Silt, olive-gray to dark-greenish-gray, less cohesive, laminated	53	70
	Till, silty, olive-gray to dark-greenish-gray	12	82
	Till, sandy, gravelly; olive-gray gravel, mostly shale and dolomite fragments	13	95
	Till, as above; little gravel	44	139
	Silt, clayey, olive-gray to dark-greenish-gray, cohesive	16	155
	Till, olive-gray, brittle, hard	35	190
Cretaceous rocks:			
	Clay, olive-gray, contains "white specks," cohesive, hard	20	210

148-53-31bbb
Test hole 107

Glacial drift:			
	Topsoil, black	2	2
	Clay, smooth, buff-yellow to brown, mottled, oxidized	20	22
	Clay, smooth, light-gray to olive-gray	35	57
	Clay, smooth, dark-olive-gray	20	77
	Till, dark-gray	10	87

148-53-32aaa
Test hole 134

Geologic source	Material	Thickness (feet)	Depth (feet)
Glacial drift:			
	Topsoil, black----------	1	1
	Sand, very fine to fine, brown; clayey with depth----------	14	15
	Clay, sandy, brown----------	5	20
	Clay, sandy, gray to olive-gray----------	12	32

TABLE 4.--Chemical analyses of selected water samples

Source: pCr, Precambrian rocks; Kd, Dakota Sandstone, may include other bedrock water-bearing units; Qd, till and associated glaciaqueous deposits, includes buried outwash deposits and isolated bodies of sand and gravel within the till; Qab, deposits of Lake Agassiz beaches, includes Hillsboro aquifer deposits; Qad, Elk valley delta deposits of glacial Lake Agassiz.

Explanation: 1/ Analyses by U.S. Geological Survey; other analyses by State Laboratories Department, Bismarck, North Dakota.

[Analytical results in parts per million except as indicated]

Location	Depth	Source	Date of collection	Temperature (°F)	Silica (SiO_2)	Total iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Sum	Dissolved solids: Residue on evaporation at 180°C	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium-adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Remarks
144-49-16cdc	140	Qd	3-27-59	41	27	0.53	82	31	275	8.6	236	0	225	390	0.4	3.7	0.76	1,160	1,200	334	140	63	6.5	2,010	7.4	1/
20ddd	375	pCr	9-11-65	42	4.7	2.3	69	41	972	8.5	166	0	482	1,280	.4	15	2.2	2,960	2,910	340	204	86	23	5,230	7.9	
144-50-12cca	180	Qd	3-28-59	..	27	.07	87	30	1,050	16	240	0	976	1,010	.8	.9	2.3	3,360	3,360	340	143	86	25	5,220	7.3	1/
13add	320	Kd(?)	3-28-59	39	20	1.4	77	36	1,000	10	232	0	928	982	.8	1.7	2.5	3,170	3,200	342	152	86	24	5,050	6.9	1/
21cdc	168	Qd	9-30-65	46	29	1.9	128	53	1,020	37	296	146	1,020	1,040	.9	1.0	2.1	3,480	3,530	538	295	79	19	5,380	7.5	1/
26ccb1	136	Qd	9-21-65	48	15	.62	166	49	659	16	200	0	576	939	.3	.0	1.8	2,520	2,570	615	451	69	12	4,250	8.1	
144-51-12abb	75	Qab	3-28-59	47	29	1.8	107	40	16	4.3	394	0	131	4.9	.6	3.3	.13	.....	539	430	107	7	.3	813	7.3	1/
12dcc	120	Qab	7-27-65	..	17	4.5	440	142	150	13	413	0	1,410	181	.0	.8	.36	2,560	2,750	1,680	1,340	16	1.6	3,070	7.5	
28dda	420	Kd	3-28-59	39	6.6	1.2	24	10	1,310	12	276	0	1,350	931	3.6	2.7	3.6	3,790	3,780	102	0	96	56	5,750	7.3	1/
33bab	315	Kd	9-30-65	44	8.8	1.1	34	12	1,140	14	124	61	1,220	846	1.8	12	2.5	3,350	3,400	134	32	94	43	5,190	7.0	1/
144-52-17aa	665	Kd	7-16-58	..	.....	1.2	38	17	1,380	28	300	0	1,420	964	3.8	3.4	4.3	4,010	3,970	162	0	94	47	.....	8.0	
30baa2	34	Qab	3-28-59	42	24	.18	258	111	58	41	474	0	576	116	.2	141	.47	1,560	1,630	1,100	711	10	.8	2,120	7.2	1/
144-53-21ccb	60	Qab	9-30-65	48	28	.27	407	1,060	2,570	101	993	488	8,860	520	.8	167	.47	14,200	14,980	5,360	4,550	50	15	14,400	7.9	1/
145-49-13bdc	177	Qd	10-1-65	52	28	.35	33	14	276	4.7	346	170	118	231	.4	3.4	.85	880	883	141	0	80	10	1,510	7.6	1/
20daa	340	Kd(?)	6-21-66	..	10	5.6	62	33	1,020	10	335	0	614	1,140	.6	1.2	2.3	3,180	3,060	290	16	88	26	4,950	7.4	
31abc	135	Qd	7-1-58	...	....	1.8	42	36	575	15	292	0	348	626	.4	1.6	1.9	.....	1,800	254	15	82	16	.....	8.2	
145-50-24bbc	17	Qab	10-5-65	48	28	.13	364	144	200	8.4	451	222	1,180	142	.3	.96	.64	2,390	2,540	1,500	1,130	22	2.2	2,760	7.9	1/
24bcb	16	Qab	7-2-58	46	....	1.8	159	149	110	9.8	617	0	645	81	.4	.4	.2	1,460	1,740	1,010	504	19	1.5	.....	7.8	
145-51- 1aba	Spring	Qab	10-25-65	46	27	.64	132	47	304	12	381	0	498	275	.6	2.4	.80	1,490	1,520	524	212	55	5.8	2,250	7.5	1/
1adc3	115	Qab	10-26-65	46	29	1.5	103	41	58	5.6	322	0	229	30	.4	5.9	.17	602	691	424	160	22	1.2	997	7.9	1/
1dab	115	Qab	10-22-65	46	....	1.6	137	49	172	8.4	353	0	412	134	.5	1.1	.40	1,090	1,160	545	256	40	3.2	1,660	7.8	1/
1ddc	90	Qab	8-3-65	..	16	.84	333	104	150	10	358	0	1,010	158	0	2.7	.40	1,960	1,160	1,260	967	20	1.8	2,470	7.7	
6bbd	351	Kd	3-28-59	45	9.2	3.9	106	30	1,080	38	282	0	1,390	799	.5	2.6	3.1	3,600	3,630	388	157	84	24	5,370	7.6	1/
16cbb1	150	Qd	10-5-65	44	29	.26	67	15	1,050	27	278	137	1,180	748	2.9	.4	2.8	3,260	3,300	227	0	90	30	4,990	7.9	1/
29bbb	360	Kd	10-5-65	45	22	.49	76	16	1,040	33	288	142	1,180	727	3.0	.3	2.8	3,240	3,250	256	20	88	28	4,900	8.0	1/
145-52-10ccc	100	Qd	10-5-65	50	26	.79	72	19	382	15	342	168	391	294	.7	2.7	1.5	1,370	1,390	257	0	75	10	2,230	7.9	1/
27bbb2	120	Qd	10-5-65	46	9.0	.59	69	22	150	8.8	392	193	134	104	.3	1.5	.83	693	715	261	0	55	4.0	1,160	8.1	1/
145-53- 2aad	415	Kd	3-28-59	45	10	5.0	135	44	818	34	247	0	1,230	657	2.1	1.0	2.3	3,060	3,080	516	313	76	16	4,520	7.3	1/
8aad	20	Qad	7-22-58	..	....	.38	162	60	8.0	10	281	32	352	54	.4	2.4	.3	819	1,060	650	366	3	.1	.....	8.5	
10acc1	165	Qd	10-5-65	54	30	4.2	91	23	158	10	468	230	114	127	.2	1.3	.99	790	783	321	0	51	3.8	1,300	7.9	1/
23dcc	480	Kd	3-28-59	48	7.2	2.5	96	24	1,130	36	266	0	1,400	804	3.2	.8	3.4	3,640	3,660	338	120	86	27	5,530	7.2	1/
27ada	520	Kd	10-5-65	46	14	1.3	187	50	1,070	260	363	179	1,800	745	2.5	14	2.6	4,330	4,340	673	375	70	18	6,080	7.7	1/
146-49- 4cdc	83	Qd	3-27-59	41	27	2.1	54	24	405	9.2	322	0	210	477	.4	8.4	1.3	1,380	1,390	235	0	78	12	2,370	7.3	1/
20aaa	130	Qd	3-27-59	..	9.8	3.8	63	32	375	11	310	0	173	485	.4	13	1.2	1,320	1,340	288	34	73	9.6	2,330	7.2	1/
146-50- 5bbb	420	Kd	6-30-58	..	....	1.0	171	69	1,240	40	307	0	1,260	1,240	1.4	2.4	3.0	4,180	4,290	711	459	78	20	.....	8.0	

[Analytical results in parts per million except as indicated]

Location	Depth	Source	Date of collection	Temperature (°F)	Silica (SiO_2)	Total iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids: Sum	Dissolved solids: Residue on evaporation at 180°C	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium-adsorption-ratio	Specific conductance (micromhos at 25°C)	pH	Remarks
146-50-10ddd	185	Qa	7-1-58	..	....	.8	116	60	1,050	24	337	0	1,220	933	.7	.4	3.1	3,580	3,640	540	264	80	20	.....	7.7	
25bda	398	Kd, pCr	10-6-65	48	7.4	1.5	39	22	1,250	14	312	153	960	1,110	1.4	1.2	3.3	3,560	3,570	189	0	93	40	5,700	7.8	1/
146-51-11adb	90	Qa	3-28-59	43	15	.90	208	60	283	14	244	0	591	425	.1	3.0	.75	1,720	1,810	766	566	44	4.5	2,650	7.2	1/
13cbb1	90	Qa	10-12-65	45	....	3.1	185	54	665	18	286	0	1,080	578	1.1	3.4	2.3	2,730	2,860	682	447	67	11	4,060	7.6	1/
24cdd1	55	Qab	6-21-66	46	26	.40	78	36	2.4	2.0	312	0	61	15	.2	.3	0	425	375	343	87	1	.1	645	7.6	
24dcc	28	Qab	6-21-66	46	27	.1	65	33	1.9	2.0	346	0	11	4.8	.2	1.0	1.1	366	100	298	14	1	.0	541	7.6	
146-53- 5aaa1	26	Qab	10-7-65	46	26	.03	165	73	86	9	520	256	361	52	.2	28	.32	1,056	1,100	712	286	21	1.4	1,510	8.1	1/
5aaa2	530	Ka	10-7-65	48	7.7	2.6	309	109	803	39	220	108	1,460	940	2.2	.2	1.7	3,780	4,030	1,220	1,040	58	10	5,480	7.8	1/
29bbb	12	Qab	3-28-59	..	24	.34	170	66	35	33	518	0	153	139	.2	36	.12	912	1,060	694	269	9	.6	1,500	7.0	1/
147-49-14bba	380	Ka	6-18-58	..	....	.6	24	15	710	11	317	17	355	680	.9	2.3	2.7	.....	1,990	66	0	95	38	.....	8.3	
35aaa	172	Qa	6-26-58	..	....	.38	34	24	438	6.0	337	0	197	486	.6	2.1	1.3	1,360	1,360	186	0	83	14	.....	8.2	
147-50-12aad	180	Qa	3-27-59	41	27	1.6	178	73	895	21	256	0	1,080	984	.5	8.6	2.3	3,400	3,470	744	534	72	14	5,170	7.0	1/
18dcd	12	Qab	10-6-65	46	28	.6	75	42	8.2	28	452	222	22	12	.2	.1	.06	438	439	358	4	4	.2	726	8.0	1/
147-51-16bab2	100	Qab	10-18-65	46	27	5.2	128	65	60	6.4	356	0	285	81	.3	.1	.18	833	878	585	293	18	1.1	1,270	7.6	1/
22bbb	100	Qab	8-9-65	..	17	.36	101	38	582	20	314	0	800	458	2.2	2.2	1.9	2,180	2,160	408	151	74	13	3,280	8.0	
34ada2	125	Qa	7-11-58	48	....	.8	95	40	61	6.5	282	0	149	130	.2	1.6	.1	.....	694	400	169	24	1.3	.....	7.6	
34ddd1	120	Qab	8-2-65	..	16	.98	196	63	712	22	283	0	1,130	667	1	2.1	2.1	2,950	3,120	750	519	67	11	4,200	7.6	
34ddd2	205	Qa	8-2-65	..	18	1.7	129	40	996	16	349	0	1,240	818	.7	1.1	3.5	3,440	3,700	485	199	81	20	5,140	7.7	
147-52-36dcc	350	Ka	6-21-66	54	16	1.7	152	49	924	37	240	0	1,390	731	1.0	.4	3.1	3,660	3,420	581	384	76	17	5,070	7.6	
148-49- 3bbd1	226	Qa	3-27-59	44	26	.93	44	20	523	7.5	330	0	205	605	.8	4.6	1.7	1,600	1,610	192	0	85	16	2,770	7.3	1/
7ccd	159	Qa	10-6-65	44	19	2.6	80	33	174	9.6	289	142	70	293	.4	2.8	.77	827	855	336	99	52	4.1	1,510	7.9	1/
18bbb	230	Qa	6-11-58	..	....	.48	83	39	245	11	282	22	179	309	.4	2.7	1.1	.....	1,120	370	102	58	5.5	.....	8.3	
28bab	168	Qa	6-21-66	..	28	2.2	77	31	110	7.5	545	0	62	32	.3	2.7	.94	650	100	318	0	42	2.7	1,060	7.4	
148-50- 1cdc	230+	Ka(?)	6-21-66	..	1.0	6.3	78	41	1,140	21	68	0	612	1,600	.2	2.4	2.0	3,430	3,540	363	308	86	26	5,770	8.2	
22adb	19	Qab	6-17-58	45	....	.6	62	31	4.0	3.0	324	0	37	0	.3	4.3	.2	.....	372	280	14	3	.1	.....	7.7	
23dcc	271	Ka(?)	6-21-66	..	9.1	7.5	197	94	652	18	152	0	667	1,090	.3	12	1.2	3,100	2,820	878	754	61	9.6	4,590	7.1	
23dcc	271	Ka(?)	10-6-65	44	8.4	8.1	146	71	650	18	150	74	552	964	.4	12	1.2	2,810	2,600	656	533	68	11	4,210	7.3	1/
148-52-13bcd2	13.2	Qab	3-26-59	38	23	.02	102	33	12	24	272	0	143	24	.1	70	.47	.....	596	392	169	6	.3	839	7.6	1/
148-53- 7aab	38	Qad	8-18-65	46	17	1.0	83	36	50	6.3	429	0	80	22	1.2	.9	.25	309	300	354	3	23	1.2	842	7.8	
8dbb	196	Qa	5-5-65	..	31	.22	32	10	266	11	598	0	12	155	.7	4.9	1.4	819	818	121	0	81	11	1,340	7.9	
15dcc	128	Qa	5-6-65	..	25	.27	95	21	126	10	514	0	150	27	.3	0	1.1	709	696	324	0	45	3	1,340	7.9	
18abd2	239	Qa	6-8-65	..	28	.59	27	7	250	9.7	616	0	12	99	.6	1.1	1.6	740	732	96	0	83	11	1,200	8.1	
18abd3	277	Qa	5-27-65	..	26	.06	20	2.7	276	9.2	621	0	29	106	.7	.9	2.1	775	850	61	0	89	15	1,250	7.9	
18acb	40	Qad	8-13-65	45	18	.04	230	106	31	4.6	488	0	543	64	.6	19	0	1,260	1,250	1,010	610	62	.4	1,630	7.7	
18acb	40	Qad	6-21-66	52	28	.16	243	100	19	4.4	478	0	540	75	.8	12	.08	1,460	1,260	1,020	627	4	3	1,740	7.5	