

STATE OF SOUTH DAKOTA
Frank Farrar, Governor

SOUTH DAKOTA GEOLOGICAL SURVEY
Duncan J. McGregor, State Geologist

Special Report 48

**GROUND-WATER INVESTIGATION FOR THE CITY OF
COLOME, SOUTH DAKOTA**

by
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INTRODUCTION

Present Investigation

This report contains the results of a special investigation by the South Dakota Geological Survey from June 12 to July 18, 1968, in and around the city of Colome, Tripp County, South Dakota (fig. 1).

Colome now obtains its water from 6 wells, about 40 feet deep, located two miles west of the city (fig. 2). The combined production of the wells is 17 gallons per minute. The low production rate is due to the high clay content and resulting low permeability of the sediments yielding water to the wells.

A survey of the ground-water possibilities was conducted in the Colome area. Included in this survey were: (1) review of the geology as mapped by the South Dakota Geological Survey (Collins, 1957a, b; and Stevenson, 1959), (2) mapping the geology of approximately 8 square miles in the northeast part of the study area, (3) drilling 143 auger test holes, (4) collecting 17 water samples for analysis, (5) surveying the elevation of the test holes in the recommended area.

As a result of this survey, a new area for ground-water development was found one and one-half miles southwest of the present well field (fig. 2). A site in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of section 1, T. 97 N., R. 76 W. (fig. 2) was recommended for a pump test. Although the survey indicated that maximum well yield would be obtained from an area to the south of the recommended site, the distance from the city and the total water requirements for the city were the main factors for the recommendation of the pump test site.

In September, 1968, a pump test was run on a new well in the recommended area. This test was conducted by J. T. Banner and Associates, Inc., with the assistance of the South Dakota Geological Survey. The data from the pump test is on file at the South Dakota Geological Survey. The results of the pump test indicated that the aquifer would sustain one or more wells with a minimum spacing of 350 feet and a maximum of 50 gallons per minute production. With any additional well yields exceeding 50 gallons per minute, spacing between wells would have to be more than 350 feet.

The cooperation of the residents of Colome, especially the city officials, Mayor K. E. Johnson, the City Councilmen, and Ben Reed, City Marshall, was greatly appreciated. The assistance of J. T. Banner and Associates, Inc. and the South Dakota Chemical Laboratory is acknowledged.

Location and Extent of Area

The Colome area as used in this report includes a region that measures six miles north-south and eight miles east-west. The area is located in south-central South Dakota in Tripp County in the Pierre Hills and Tertiary Table Lands sections of the Great Plains physiographic province (fig. 1).

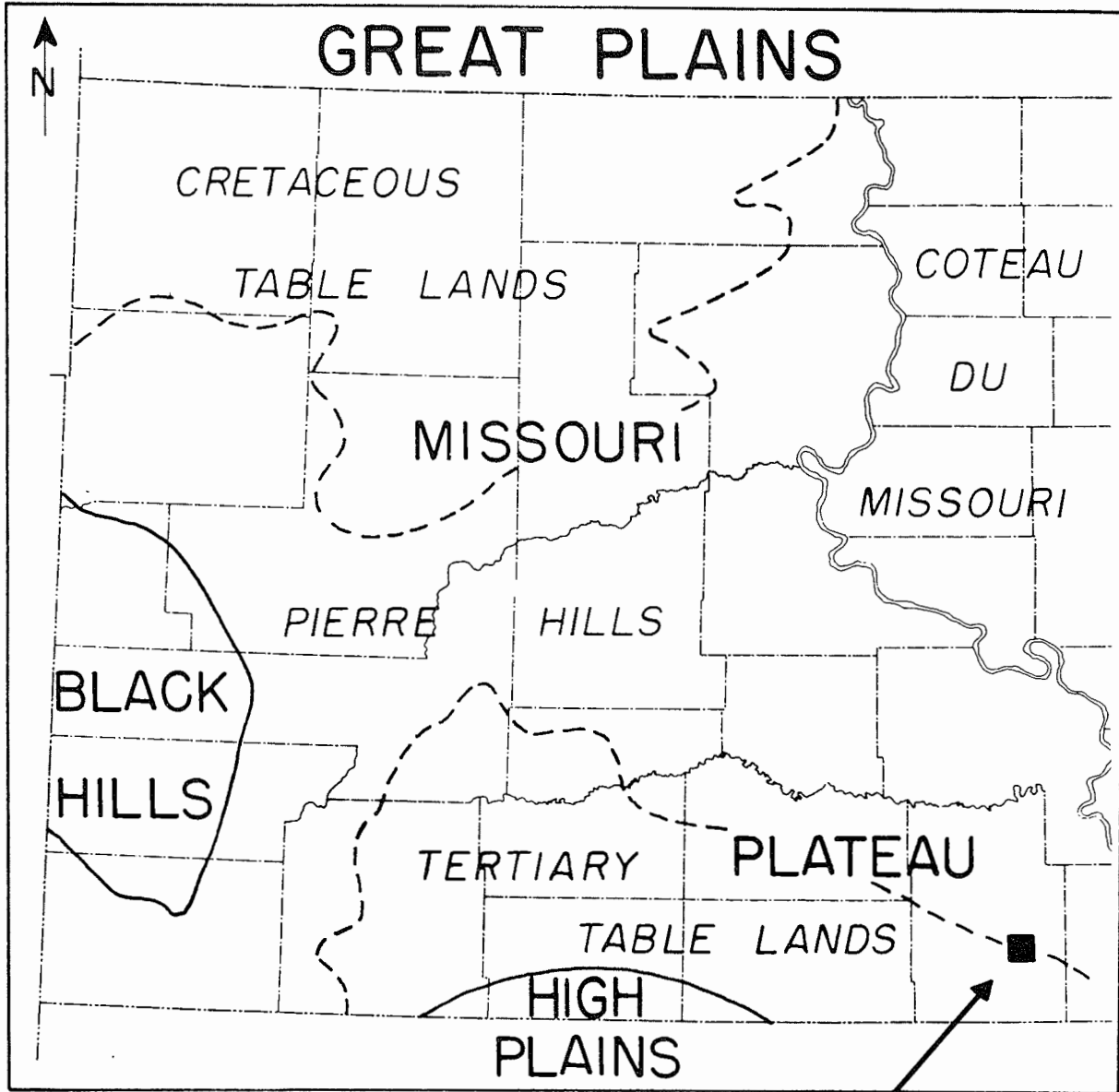
GENERAL GEOLOGY

Surficial Deposits

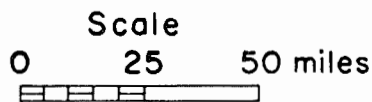
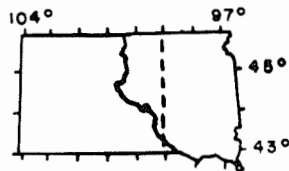
The surficial deposits of the Colome area include alluvium, dune sand and loess. Alluvium in this area consists of silt and sand occurring as a thin layer along the Ponca Creek and its tributaries (fig. 3). The dune sand and loess do not cover large areas so these deposits are not shown on figure 3.

Exposed Bedrock

The Cretaceous Pierre Shale underlies the entire area and is exposed at lower altitudes in the northeast part of the study area (fig. 3). Overlying the Pierre Shale and exposed throughout the rest of the area are Tertiary deposits of the Ogallala Group (fig. 3). The



(after Rothrock 1943, and Flint 1955)



■ Colome

Figure 1. Map showing the major physiographic divisions of western South Dakota and location of the Colome area.

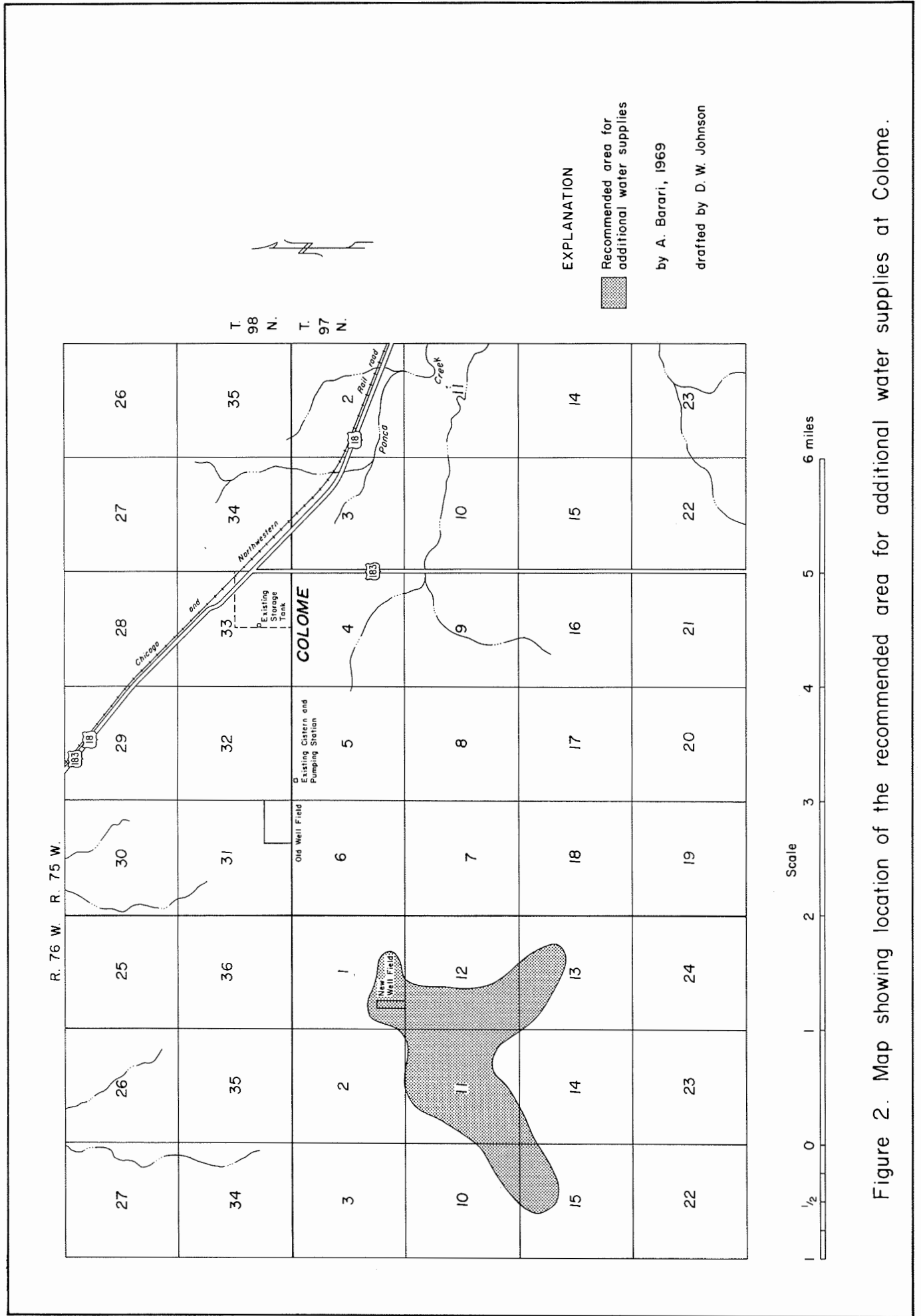


Figure 2. Map showing location of the recommended area for additional water supplies at Colome.



T. 98 N.
T. 97 N.

R. 76 W. R. 75 W.

EXPLANATION

- QUATERNARY
 - Alluvium
- TERTIARY
 - Ash Hollow Formation
 - OGALLALA GROUP
 - Valentine Formation
- CRETACEOUS
 - Pierre Shale

by A. Barari, 1969

drafted by D. W. Johnson



Figure 3. Geologic map of the Colome area. (Modified from Collins, 1957 - a and b, and Stevenson, 1959.)

Ogallala Group is represented in the Colome area by the Ash Hollow Formation (upper unit) and the Valentine Formation (lower unit).

The Ash Hollow Formation consists of medium-gray to light olive-green calcareous sand and sandstone. It is a fine-grained arkosic sand and sandstone with siltstone layers (Collins, 1957a and b). The buttes and uplands southwest of Colome are capped with the Ash Hollow Formation.

The Valentine Formation is mostly greenish-tan to tan, fine to medium-grained sand. The size and color of the sand may vary locally. Included in the Valentine Formation is the Bijou facies which is a locally cemented sand. The sand is well cemented by siliceous or opaline material and forms a hard dense green arkosic sandstone (Collins, 1957a and b).

The maximum thickness of Ogallala Group in the study area is 94 feet (test hole 142, App. A).

A varicolored clay layer is locally present underlying the sediments of the Ogallala Group and overlying the Pierre Shale. At some locations the clay contains sand and pebbles. The presence of this clay deposit has been determined from test hole data. This clay probably crops out along the contact of the Pierre Shale and the Valentine Formation (fig. 3); however, the probable thinness of the clay unit, the low slopes and resulting lack of exposures at the contact has obscured any possible surface exposures of this unit in this area. On the Winner geologic quadrangle (Collins, 1957a) the Brule Formation occupies a similar stratigraphic position as the varicolored clay near Colome. More information is required to determine whether the varicolored clay near Colome is part of the Brule Formation.

The Pierre Shale is a dark, platy marine clay-shale, upper layers are gray to olive-brown, and the lower layers are black to dark gray. The total thickness of the Pierre Shale may be as much as 900 feet in the Colome area.

Subsurface Bedrock

The subsurface information is based on data extrapolated to the Colome area from oil well tests in Tripp and Gregory Counties. The following formations are described in descending order from younger to older.

Cretaceous Sediments

The Niobrara Formation consists mostly of white speckled calcareous shale or marl and is approximately 160 feet thick.

The Carlile Shale is light- to medium-gray, plastic shale and is about 230 feet thick.

The Greenhorn Limestone is a light-colored fragmental limestone and a medium-gray, highly calcareous shale and is about 50 feet thick.

The Belle Fourche shale is about 130 feet thick and consists of medium-gray shale.

The Dakota Formation is comprised of alternating shale and sandstone and is nearly 420 feet in the Colome area. The lower part of the formation contains very little shale.

The Skull Creek Shale is a medium-gray shale approximately 40 feet thick.

The Inyan Kara Group consists of alternating beds of shale and sandstone and is at least 300 feet thick in the Colome area.

Paleozoic Sediments

The Pennsylvanian system is represented by the Roundtop Formation, which in this area is about 75 feet of varicolored shale, and the Fairbank Formation which is approximately 140 feet of sandstone.

The Mississippian system is represented by about 25 feet of carbonates of the Logepole Formation.

The Devonian-Silurian systems consist of a 40-foot sand section.

The Ordovician system is represented by 60 feet of sandy and porous Red River carbonates.

The Cambrian and Ordovician sands are approximately 60 feet thick and overlie the Precambrian granite.

GROUND WATER

Concepts

Ground water is defined as that water contained in the voids or openings within rocks or sediments below the water table. The water table is the upper surface of the zone of saturation. Practically all open spaces in the rocks that lie beneath the water table are filled with water. Rocks (including the soil) that lie above the water table are in the zone of aeration. Some of the interstices in this zone are also filled with water, but the water is either held in them by molecular attraction or is moving downward toward the zone of saturation. Water within the ground moves downward through the unsaturated zone under the action of gravity, whereas in the saturated zone, it moves in a direction determined by the surrounding hydraulic head.

Contrary to popular belief, ground water does not occur in "veins" that crisscross the land at random. Instead it can be shown that water is found nearly everywhere beneath the surface, but at varying depths.

Nearly all ground water is derived from precipitation in the form of rain, melting snow, or ice. This water either evaporates, percolates directly downward to the water table and becomes ground water, or drains off as surface water. Surface water either evaporates, escapes to the ocean by streams, or percolates downward into the rocks.

Recharge is the addition of water to an aquifer (a formation having structures that permit appreciable water to move through it under ordinary field conditions), and is accomplished in four main ways: (1) downward percolation of precipitation from the ground surface, (2) by downward percolation from surface bodies of water, (3) by lateral underflow of water in transient storage, and (4) by artificial recharge, which takes place from excess irrigation, seepage from canals, and water purposely applied to augment ground-water supplies.

Discharge of ground water from an aquifer is accomplished in four main ways: (1) by evaporation and transpiration of plants, (2) by seepage upward or laterally into surface bodies of water, (3) by lateral movement of water in transient storage, and (4) by pumping from wells, which constitutes the major artificial discharge of ground water.

The porosity of a rock or soil is a measure of the contained open pore spaces, and it is expressed as the percentage of void spaces to the total volume of the rock. The porosity of a sedimentary deposit depends chiefly on (1) the shape and arrangement of its particles, (2) the degree of assortment of its particles, (3) the cementation and compaction to which it has been subjected since its deposition, (4) removal of mineral matter through solution by percolating waters, and (5) the fracturing of the rock, resulting in joints and other openings. Thus, the size of the material has no or little effect on porosity if all other factors are equal.

The permeability of a rock is its capacity for transmitting a fluid. Water will pass through a material with interconnected pores, but will not pass through material with unconnected pores, even if the latter material has a higher porosity. Therefore, permeability and porosity are not synonymous.

Ground Water in Surficial Deposits

Alluvium in the Colome area is thin and has a restricted areal extent. A few farm wells penetrate the alluvium and are completed in the Pierre Shale. Although the bottom of the wells are in Pierre Shale, most of the water probably comes from the alluvium. These wells usually provide enough water for domestic purposes but this deposit should not be considered a potential city water supply because of its limited yield.

Ground Water in Exposed Bedrock

In the study area the Ash Hollow Formation is fine-grained and is usually above the water table. Thus, in this report, the Ash Hollow is not considered to be a water-bearing unit.

The Valentine Formation comprises the main aquifer in the Colome area. The extent of the formation can be seen on figure 3. Although the formation is extensive, the saturated sand unit which comprises the aquifer varies locally in thickness (fig. 4). The area recommended to the city for development is shown on figure 2. Within this area the saturated sand is fine to medium grained and generally well sorted although locally it may contain considerable silt and clay.

The saturated thickness of sand in the recommended area varies from about 30 to 60 feet. The maximum saturated thickness of sand encountered in the study area is about one and one-half miles south of the recommended area where 76 feet of saturated sand was penetrated (test hole 142, fig. 5 and App. A, see also fig. 4). Additional information would be required to properly evaluate this area. The somewhat-linear pattern and rapid thinning and thickening of the sand unit in the study area is suggestive of a channel deposit.

The varicolored clay underlying the Ogallala Group is relatively thin and has low permeability. Locally this clay might supply enough water for domestic purposes but it would not provide enough water for a municipal water supply.

The Pierre Shale underlies the entire area either at surface or in the subsurface. Several wells in the area are completed in the Pierre Shale, including some of the city wells, but because of the low permeability of the shale it does not yield large quantities of water. Water quality data presented in the next section of this report indicate that even those wells bottomed in Pierre Shale derive most or all of their water from the overlying sediments of the varicolored clay and the Ogallala Group.

Ground Water in Subsurface Bedrock

The sandstones of the Dakota Formation and the Inyan Kara Group are the only Cretaceous sediments in the study area that could supply an adequate quantity of water for a municipal water supply. The top of the Dakota Formation is at a depth of about 1400 feet at Colome. The basal 130 feet of the Dakota Formation would probably supply the greatest amount of water. The top of the Inyan Kara Group is at a depth of approximately 1900 feet at Colome.

The top of the Paleozoic rocks is at a depth of about 2100 feet. All the Paleozoic Formations except the upper Roundtop Formation are potential aquifers in the Colome area.

Quality of Ground Water

Ground water always contains dissolved chemical substances in various amounts. Contained chemicals are derived (1) from the atmosphere as water vapor condenses and falls, (2) from soil and underlying deposits as the water moves downward to the water table, and (3) from deposits below the water table where the water is circulating. In general, the more chemical substances that a water contains, the poorer its quality.

Table 1 is a comparison of the quality of water from the Ogallala Group with the Public Health Standards for drinking water. Except for low fluoride all the samples are within the Public Health standards. Table 2 shows the results of water analyses from various sources. Generally these samples are higher in chemical content than water from the Valentine Formation.

Several wells in the Colome area are completed in the Pierre Shale although most of the water probably is derived from the overlying sediments. Supportive evidence for this conclusion is furnished by looking at the water analyses in table 2. Water samples W2, W12, and W16 are from wells completed only in the Pierre Shale. The water from these wells contains considerably more total solids than the other wells listed. The other wells in table 2

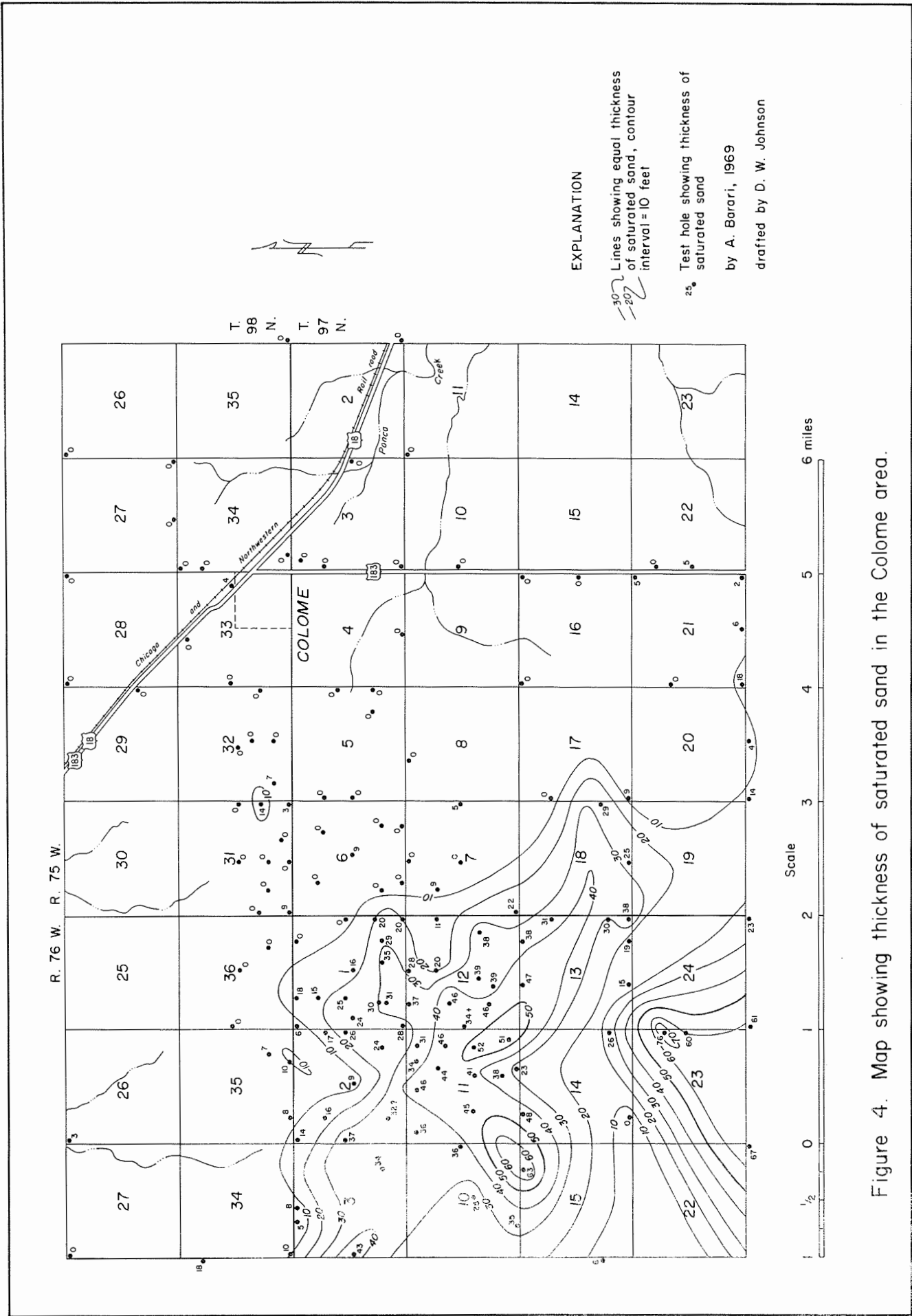


Figure 4. Map showing thickness of saturated sand in the Colome area.

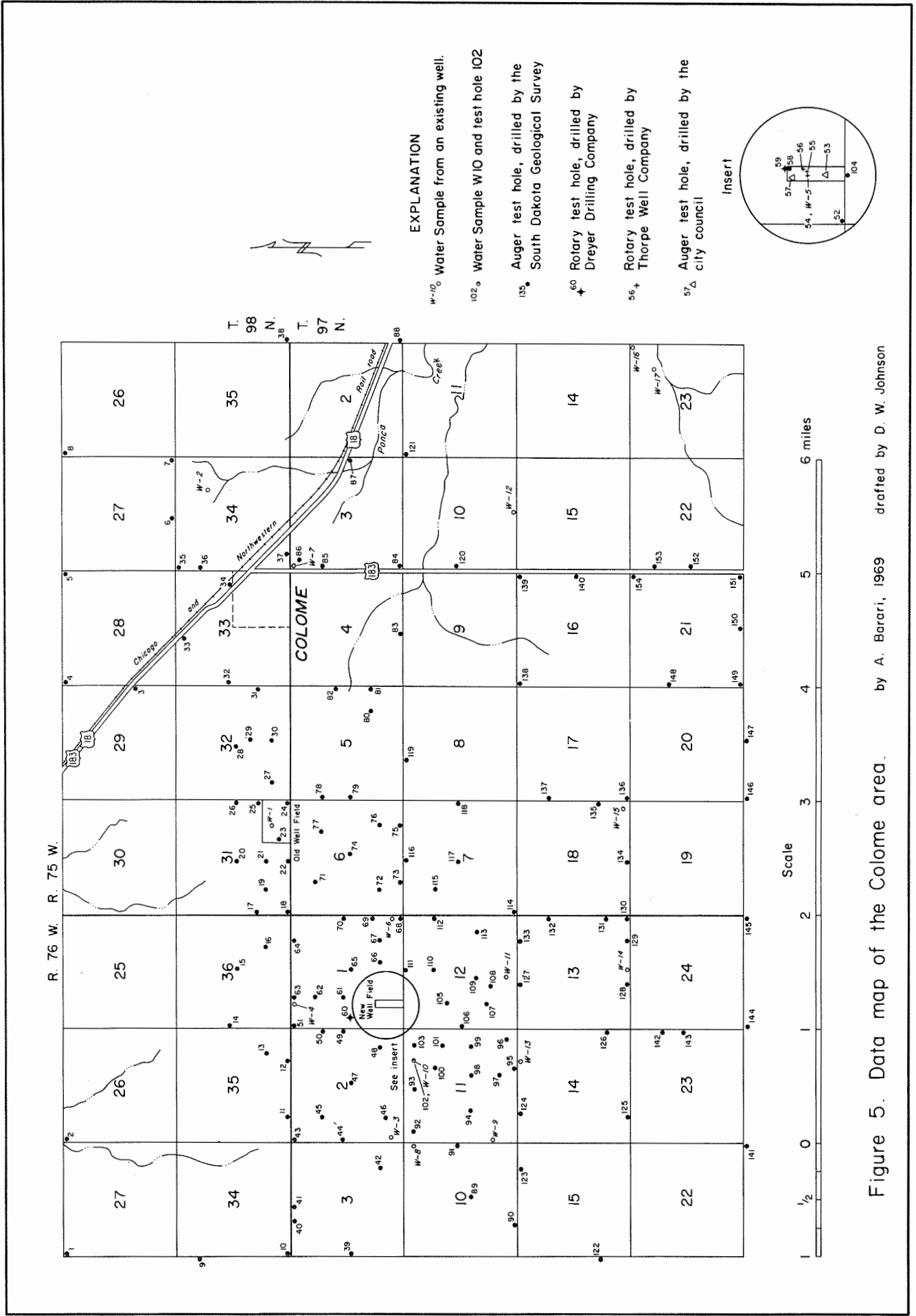


Figure 5. Data map of the Colome area. by A. Barari, 1969 drafted by D. W. Johnson

Table 1.—Chemical analyses of water samples from the Ogallala Group

Sample	Parts Per Million											
	Calcium	Sodium	Magnesium	Chloride	Sulfate	Iron	Manganese	Nitrate (Nitrogen)	Fluoride	pH	Hardness CaCO ₃	Total Solids
A	---	---	50	250	500 ^{1/}	0.3	0.005	10.0	0.9- ^{2/} 1.7 ^{2/}	---	---	1000 ^{1/}
W3	66		0	2	9	0.02	0		0.31	7.9	164	271
W4	167		2.4	40	39	0.05		39		7.5	415	731
W5	52	4	10	0	12	0	0	5.8	0.2		173	288
W6	71		4	22	16	0.03	0		0.10	7.3	192	363
W8	43		1	0	7	0.03	0	2.0	0.16	7.8	112	186
W9	64		5	0	3	0	0		0.23	7.8	180	281
W10	43		1	0	13	0.15	0	4.7	0.48	8.2	112	202
W11	40		0	0	11.75	0.03				7.6	160	295
W13	74		2	4	6	0.07	0		0.39	7.7	192	305
W14	76		2.4	2.5	12	0		7.6		7.6	200	310
W15	82		4.8	2.5	18	0.02		15.4		7.6	225	382

^{1/} Modified for South Dakota by the Department of Health (written communication, Water Sanitation Section, March 20, 1968).

^{2/} 1.2 is optimum for South Dakota.

Location of water samples from the Ogallala Group
(for map location, see figure 5)

A. Drinking water standards, U. S. Public Health Service (1962).

W3. NW¹/₄SW¹/₄SW¹/₄ sec. 2, T. 97 N., R. 76 W., F. Sand, 30 feet deep, water table 10 feet.

W4. NE¹/₄NE¹/₄NW¹/₄NW¹/₄ sec. 1, T. 97 N., R. 76 W., J. Jorgensen, 30 feet deep, water table 12 feet.

W5. SE¹/₄NE¹/₄SW¹/₄SW¹/₄ sec. 1, T. 97 N., R. 76 W., 43 feet deep, New City Well.

W6. NE¹/₄SE¹/₄SE¹/₄SE¹/₄ sec. 1, T. 97 N., R. 76 W., D. Hermsen, 35 feet deep?

W8. SE¹/₄NE¹/₄NE¹/₄NE¹/₄ sec. 10, T. 97 N., R. 76 W., F. Sand, 30 feet deep, water table 15 feet.

W9. NW¹/₄NW¹/₄SW¹/₄SW¹/₄ sec. 11, T. 97 N., R. 76 W., R. Snethen, 30 feet deep?

W10. SE¹/₄NE¹/₄NW¹/₄NE¹/₄ sec. 11, T. 97 N., R. 76 W., H. Fetzer, test hole 102.

W11. NE¹/₄SE¹/₄SE¹/₄SW¹/₄ sec. 12, T. 97 N., R. 76 W., M. Fetzer, 20 feet deep.

W13. NE¹/₄NE¹/₄NW¹/₄NE¹/₄ sec. 14, T. 97 N., R. 76 W., School House.

W14. SW¹/₄SW¹/₄SW¹/₄SE¹/₄ sec. 13, T. 97 N., R. 76 W., M. Manthey, 44 feet deep, water table 26 feet.

W15. SE¹/₄SE¹/₄SE¹/₄ sec. 18, T. 97 N., R. 75 W., Mrs. C. Schultz, 40 feet deep.

Table 2.—Chemical analyses of water samples from various formations

Sample	Source ^{1/}	Parts Per Million											
		Calcium	Sodium	Magnesium	Chloride	Sulfate	Iron	Manganese	Nitrate (Nitrogen)	Fluoride	pH	Hardness CaCO ₃	Total Solids
A		---	---	50	250	500 ^{2/}	0.3	0.005 ^{2/}	10.0	0.9- ^{3/} 1.7	---	---	1000 ^{2/}
W1	O & C	93	25	23	7	52	0.9	0.04	1	0.6	7.6	327	462
W2	P	352		54	50	575	0.02	0	14.2	0.38	7.4	1100	1505
W7	C & P	192		32	64	72	0	0	44.5	0.34	7.3	610	956
W12	P	398		102	125	988	0		79		7.2	1410	2020
W16	P	400		70.5	260	788	0		70		7.2	1290	2250
W17	A & P	96		11	8		0		0.78	0.8	7.2	285	470

^{1/} A, Alluvium; O, Ogallala Group; C, Varicolored clay between Ogallala Group and Pierre Shale; P, Pierre Shale.

^{2/} Modified for South Dakota by the Department of Health (written communication, Water Sanitation Section, March 20, 1968).

^{3/} 1.2 is optimum for South Dakota.

Location of water samples from different formations
(for map location, see figure 5)

A. Drinking water standards, U. S. Public Health Service (1962).

W1. SW¹/₄NW¹/₄SE¹/₄SE¹/₄ sec. 31, T. 98 N., R. 75 W., present city well field.

W2. NE¹/₄NE¹/₄SW¹/₄NE¹/₄ sec. 34, T. 98 N., R. 75 W., D. Evans, 50 feet deep.

W7. NW¹/₄NW¹/₄NW¹/₄NW¹/₄ sec. 3, T. 97 N., R. 75 W., K. Johnson, 28 feet deep.

W12. SW¹/₄SW¹/₄SW¹/₄SE¹/₄ sec. 10, T. 97 N., R. 75 W., H. Sorber, 65 feet deep.

W16. NE¹/₄NE¹/₄NE¹/₄NE¹/₄ sec. 23, T. 97 N., R. 75 W., M. Fetzer, 20 feet deep, water table 8 feet (next to the house).

W17. SW¹/₄SW¹/₄NE¹/₄NE¹/₄ sec. 23, T. 97 N., R. 75 W., M. Fetzer, 27 feet deep (in the farm).

Sample W1, except for pH, was analyzed by the South Dakota Chemical Laboratory. The rest of the samples were analyzed by the Water Quality Laboratory of the South Dakota Geological Survey.

are completed in the Pierre Shale which is overlain with sediments of the Ogallala Group, the varicolored clay or alluvium. In all instances the water from these wells is of better quality than the water which is derived wholly from the Pierre Shale.

No quality of water is listed for subsurface bedrock formations at Colome; however, data from surrounding areas indicate the water is highly mineralized and would probably require treatment for use as a municipal supply.

CONCLUSIONS AND RECOMMENDATIONS

After the field study it was concluded that the city of Colome could test for future water supplies in the Valentine Formation in the recommended area outlined in figure 2. After considering the aquifer characteristics (saturated thickness, clay content, and grain size), distance from the city, the total water requirement, land availability, and easement rights, a pump test was conducted in SW $\frac{1}{4}$ SW $\frac{1}{4}$ section 1, T. 97 N., R. 76 W. The pump test was run at a rate of 50 gallons per minute with one well. This pumping rate is almost three times the rate of the whole present well field production. The results of the pump test indicate that the new well field will provide enough water for the city at the present time. The results of the pump test also indicated that the spacing of the wells should be a minimum of 350 feet with wells yielding 50 gallons per minute. If additional wells are installed in the area and exceed 50 gpm production, new spacing criteria should be computed.

The city officials should consult with the South Dakota Water Resources Commission with regard to obtaining a water right and a permit to drill new city well(s), and the South Dakota Department of Health with regard to the biological and chemical suitability of the water.

REFERENCES CITED

- Collins, S. G., 1957a, Geology of the Winner quadrangle, South Dakota: S. Dak. Geol. Survey, map and text.
- _____, 1957b, Geology of Wewela quadrangle, South Dakota: S. Dak. Geol. Survey, map and text.
- Flint, R. F., 1955, Pleistocene geology of eastern South Dakota: U. S. Geol. Survey Prof. Paper 262, fig. 1.
- Rothrock, E. P., 1943, A geology of South Dakota, Part I: The surface: S. Dak. Geol. Survey Bull. 13, 88 p., 30 pl., 3 maps.
- Stevenson, R. E., 1959, Geology of the Dallas quadrangle, South Dakota: S. Dak. Geol. Survey, map and text.
- U. S. Public Health Service, 1962, Drinking Water Standards: U. S. Public Health Service, 6 p.

APPENDIX A

Logs of test holes and wells in the Colome area

(for location see figure 5)

Test Hole No. 1 (drilled in 1965)

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 27, T. 98 N., R. 76 W.

Depth to water: dry

0- 3	Topsoil, brown, sandy
3- 4	Sand, medium, clayey
4- 14	Clay, tan

* * * *

Test Hole No. 2 (drilled in 1965)

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 26, T. 98 N., R. 76 W.

Depth to water: 6 feet

0- 2	Topsoil, sandy
2- 9	Sand, brown, clayey
9- 19	Clay, some sand

* * * *

Test Hole No. 3

Location: NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 98 N., R. 75 W.

Depth to water: dry

0- 12	Clay, light-brown, sandy
12- 27	Clay, dark-brown
27- 34	Clay, yellowish-brown, some pebbles

* * * *

Test Hole No. 4

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 28, T. 98 N., R. 75 W.

Depth to water: dry

0- 2	Topsoil
2- 5	Clay, dark-brown, sandy
5- 24	Shale, yellowish-gray

* * * *

Test Hole No. 5

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 28, T. 98 N., R. 75 W.

Depth to water: dry

0- 4	Topsoil, sandy clay
4- 19	Shale, yellowish-brown

* * * *

Test Hole No. 6

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 27, T. 98 N., R. 75 W.

Depth to water: not measured

0- 6	Roadbed
6- 28	Clay, brown, medium
28- 68	Clay, brown, very tight
68- 74	Clay, dark gray (shale)

* * * *

Test Hole No. 7

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 27, T. 98 N., R. 75 W.

Depth to water: dry

0- 6	Roadbed
6- 9	Clay, gray
9- 26	Clay, sandy
26- 36	Clay, brownish-gray, sandy
36- 49	Clay, yellowish-brown (weathered shale?)

* * * *

Test Hole No. 8

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 26, T. 98 N., R. 75 W.

Depth to water: dry

0- 4	Topsoil
4- 10	Clay, dark-brown
10- 24	Shale, yellowish-brown, grading to dark gray

* * * *

Test Hole No. 9 (drilled in 1965)

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 33, T. 98 N., R. 76 W.

Depth to water: 16 feet

0- 2	Topsoil, black
2- 5	Sand, brown, medium
5- 10	Sand, dark-brown, clayey
10- 20	Sand, tan, clayey
20- 34	Sand, medium
34- 39	Clay

* * * *

Test Hole No. 10

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 34, T. 98 N., R. 76 W.

Depth to water: 18 feet

0- 18	Sand, light-brown, fine to medium
18- 28	Sand, dark-brown, fine to medium
28- 38	Sand and clay, brown
38- 59	Clay, greenish-tan, grading to reddish-brown

* * * *

Test Hole No. 11

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 35, T. 98 N., R. 76 W.

Surface elevation: 2253 feet

Depth to water: 7 feet

0- 8	Roadbed
8- 16	Sand, gray, medium
16- 24	Clay, greenish-tan, sandy
24- 59	Clay, brown

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Test Hole No. 12

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 35, T. 98 N., R. 76 W.

Depth to water: 6 feet

0- 5	Roadbed
5- 16	Sand, light-brown, fine to medium
16- 27	Clay, tan
27- 34	Shale, gray

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Test Hole No. 13

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 35, T. 98 N., R. 76 W.

Depth to water: 4 feet

0- 4	Topsoil
4- 11	Sand, light-gray, medium
11- 34	Clay, yellowish-brown

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Test Hole No. 14

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 36, T. 98 N., R. 76 W.

Depth to water: dry

0- 36	Clay, yellowish-brown
36- 44	Shale, black

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Test Hole No. 15

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 36, T. 98 N., R. 76 W.

Depth to water: dry

0- 7	Clay, brown, contains some pebbles
7- 19	Clay, brown, no pebbles
19- 22	Clay, brownish-yellow
22- 29	Shale, black

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Test Hole No. 16

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 36, T. 98 N., R. 76 W.

Depth to water: dry

Test Hole No. 16 -- continued.

0- 1	Topsoil
1- 6	Clay, brown, sandy
6- 9	Clay, brown
9- 36	Clay, yellowish-brown
36- 44	Shale, black

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Test Hole No. 17

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Depth to water: 20 feet

0- 4	Sand, brown, fine to medium
4- 9	Clay, brown
9- 19	Clay, sandy
19- 24	Clay, brown
24- 39	Clay, brown to grayish-brown

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Test Hole No. 18

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Surface elevation: 2316 feet

Depth to water: 8 feet

0- 8	Sand, brown, medium
8- 11	Sand, light-gray, medium
11- 17	Sand, some clay
17- 29	Clay, light-tan

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Test Hole No. 19

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Depth to water: 19 feet

0- 7	Sand, dark-brown, medium
7- 13	Clay, brown, sandy
13- 19	Clay, yellowish-brown, contains pebbles

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Test Hole No. 20

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Depth to water: dry

0- 7	Silt and sand, light-brown
7- 30	Clay, dark-brown, weathered
30- 34	Clay and weathered shale

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Test Hole No. 21

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Depth to water: dry

Test Hole No. 21 – continued.

0- 2	Topsoil
2- 5	Clay, brown- to light-gray, sandy
5- 12	Sand, light-brown, medium
12- 19	Clay, dark-gray
19- 29	Clay, brownish-yellow

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Test Hole No. 22

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Depth to water: dry

0- 7	Sand, brownish-tan, medium
7- 23	Clay, yellowish-brown
23- 29	Clay, grayish-brown, darker at bottom

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Test Hole No. 23

Location: NW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Depth to water: dry

0- 5	Sand, dark-brown, medium, some clay
5- 31	Clay, brown
31- 36	Clay, yellowish-brown
36- 49	Shale, black

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Test Hole No. 24

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Depth to water: 18 feet

0- 15	Sand, tan, medium
15- 18	Sand, tan, medium, some clay
18- 21	Sand, medium, some clay
21- 29	Clay, dark gray

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Test Hole No. 25

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Depth to water: 17 feet

0- 2	Topsoil
2- 6	Sand, brown, medium to coarse
6- 17	Clay, brown, sandy
17- 31	Sand, fine to medium
31- 39	Clay, silver-gray, sandy
39- 41	Clay, greenish-tan, sandy
41- 45	Shale, brown
45- 49	Shale, dark-gray

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Test Hole No. 26

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 31, T. 98 N., R. 75 W.

Depth to water: 22 feet

0- 2	Topsoil, sandy
2- 22	Clay, brown
22- 50	Silt, brown, some sand
50- 59	Shale, brownish-gray, weathered

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Test Hole No. 27

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 32, T. 98 N., R. 75 W.

Depth to water: 7 feet

0- 7	Clay, light-brown, sandy
7- 14	Sand, tan, fine to medium
14- 34	Clay, brown, sandy
34- 39	Shale

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Test Hole No. 28

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 32, T. 98 N., R. 75 W.

Depth to water: dry

0- 3	Topsoil
3- 30	Silt, dark-brown, some pebbles
30- 44	Clay, brown (weathered shale)
44- 55	Shale, brown- to black

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Test Hole No. 29

Location: NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 32, T. 98 N., R. 75 W.

Depth to water: dry

0- 4	Clay, dark-brown
4- 39	Clay, light-brown, sandy
39- 44	Shale, brown

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Test Hole No. 30

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 32, T. 98 N., R. 75 W.

Depth to water: dry

0- 2	Topsoil
2- 9	Clay, grayish-brown, sandy
9- 29	Clay, brown, some pebbles
29- 39	Sand, brown, medium
39- 44	Sand, light-brown
44- 49	Clay, dark-brown

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Test Hole No. 31

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 32, T. 98 N., R. 75 W.

Depth to water: dry

0- 3	Topsoil, sandy
3- 9	Sand, brown, clayey
9- 39	Clay, brown
39- 49	Shale, brown

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Test Hole No. 32

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 33, T. 98 N., R. 75 W.

Depth to water: dry

0- 9	Clay, brown, few sand grains
9- 19	Clay, brown, more sand
19- 34	Clay, no sand
34- 39	Shale, brown, weathered
39- 44	Shale, gray

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Test Hole No. 33

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 33, T. 98 N., R. 75 W.

Depth to water: dry

0- 3	Topsoil
3- 12	Clay, brown, medium
12- 14	Sand, brown, fine to medium
14- 17	Sand, clayey, brown
17- 26	Shale, brownish-gray
26- 29	Shale, black

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Test Hole No. 34

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 33, T. 98 N., R. 75 W.

Depth to water: 7 feet

0- 4	Topsoil
4- 7	Clay, brown
7- 11	Sand, light-brown, fine to medium
11- 16	Clay, tan
16- 22	Shale, black
22-	Rock

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Test Hole No. 35

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 34, T. 98 N., R. 75 W.

Depth to water: not measured

0- 6	Roadbed
6- 12	Clay, light-green
12- 34	Clay, light-brown

Test Hole No. 35 – continued.

34- 39 Clay, reddish-brown, sandy
 39- 49 Clay, dark-brownish-gray

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Test Hole No. 36

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 34, T. 98 N., R. 75 W.
 Depth to water: not measured

0- 2 Topsoil
 2- 16 Clay, greenish-tan
 16- 22 Clay, reddish-tan
 22- 29 Clay, contains pebbles

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Test Hole No. 37

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 34, T. 98 N., R. 75 W.
 Depth to water: 13 feet

0- 6 Roadbed
 6- 16 Clay, dark-gray
 16- 24 Clay, yellowish-brown, contains pebbles
 24- 34 Clay, light-gray, contains pebbles
 34- 44 Shale, black

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Test Hole No. 38

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 36, T. 98 N., R. 75 W.
 Depth to water: dry

0- 3 Sand, dark-brown, fine
 3- 7 Clay, brown, sandy
 7- 30 Clay, brown
 30- 39 Clay, black

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Test Hole No. 39

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 3, T. 97 N., R. 76 W.
 Depth to water: 90 feet?

0- 1 Topsoil
 1- 16 Sand, dark-brown, fine to medium
 16- 40 Sand, light-brown, fine to medium, little clay
 40-133 Sand, tan, fine to medium
 133-134 Clay, greenish-tan

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Test Hole No. 40 (drilled in 1965)

Location: NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 97 N., R. 76 W.
 Depth to water: 10 feet

Test Hole No. 40 – continued.

0- 2	Topsoil
2- 4	Sand, brown, medium
4- 15	Sand, tan, fine
15- 29	Clay, tan

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Test Hole No. 41 (drilled in 1965)*

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 97 N., R. 76 W.

Depth to water: 6 feet

0- 4	Roadbed
4- 9	Sand, fine to medium, some clay
9- 14	Sand, fine, some clay
14- 19	Clay, gray, not compacted
19- 24	Clay, compacted
24- 29	Shale, light-brown

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Test Hole No. 42

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 3, T. 97 N., R. 76 W.

Depth to water: 69 feet

0- 5	Sand, dark-brown, fine to medium
5- 27	Sand, brown, medium, some clay
27- 34	Sand, light-brown, clayey
34- 48	Sand, light-brown, fine to medium, some clay
48- 69	Sand, tan, clean
69-103	Sand, light-brown, medium, little or no clay
103-108	Clay, greenish-brown

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Test Hole No. 43

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 2, T. 97 N., R. 76 W.

Surface elevation: 2249 feet

Depth to water: 5 feet

0- 5	Sand, dark-gray, medium
5- 9	Sand, light-gray, fine to medium
9- 19	Sand, light-gray, fine, some clay
19- 25	Clay, brown, very sandy
25- 45	Clay, light-grayish-brown
45- 69	Shale, light-brown to gray

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Test Hole No. 44

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 2, T. 97 N., R. 76 W.

Surface elevation: 2291 feet

Depth to water: 3 feet

0- 1	Topsoil
1- 9	Sand, brown, fine to medium

Test Hole No. 44 – continued.

9- 29	Sand, light-gray, little clay
29- 34	Sand, dark-gray
34- 40	Sand, black, with much clay
40- 59	Clay, white, grading into reddish-brown
59- 64	Clay, brown, many pebbles

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Test Hole No. 45

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 2, T. 97 N., R. 76 W.

Surface elevation: 2258 feet

Depth to water: 1 foot

0- 1	Topsoil
1- 17	Sand, brown, fine to medium
17- 27	Clay, greenish-tan
27- 34	Clay, reddish-brown, with pebbles

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Test Hole No. 46

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 2, T. 97 N., R. 76 W.

Surface elevation: 2330 feet

Depth to water: 34 feet?

0- 2	Topsoil
2- 34	Sand, light-brown, medium
34- 66	Sand, brown, medium, clean
66- 74	Clay, tan, very hard drilling

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Test Hole No. 47

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 2, T. 97 N., R. 76 W.

Surface elevation: 2281 feet

Depth to water: 3 feet

0- 3	Topsoil
3- 12	Sand, light-gray, medium
12- 24	Clay, greenish-tan, sandy
24- 34	Clay, brownish-red, sandy
34- 44	Clay, brown

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Test Hole No. 48

Location: NE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 2, T. 97 N., R. 76 W.

Surface elevation: 2298 feet

Depth to water: 3 feet

0- 1	Topsoil
1- 14	Sand, brown, medium
14- 27	Sand, dark-gray, fine, some clay
27- 34	Shale, yellowish-brown, some black patches

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Test Hole No. 49

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 2, T. 97 N., R. 76 W.

Surface elevation: 2303 feet

Depth to water: 7 feet

0- 9	Sand, medium
9- 33	Sand, light-brown, medium
33- 49	Clay, brown, some sand grains

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Test Hole No. 50

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 2, T. 97 N., R. 76 W.

Surface elevation: 2298 feet

Depth to water: 6 feet

0- 4	Sand, brown
4- 23	Sand, light-brown
23- 34	Clay, sandy

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Test Hole No. 51

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.

Surface elevation: 2285 feet

Depth to water: 6 feet

0- 6	Sand, brown, fine to medium
6- 12	Sand, light-brown, medium
12- 34	Clay, yellowish-brown

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Test Hole No. 52

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.

Surface elevation: 2310 feet

Depth to water: 5 feet

0- 14	Sand, dark-gray, medium
14- 33	Sand, gray
33- 44	Clay, light-brown

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Test Hole No. 53 (drilled by the City Council)

Location: NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 75 W.

Depth to water: 7 feet

0- 2	Topsoil
2- 39	Sand, fine to medium
39- 40	Clay, light-brown, some white thin layers

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Test Hole No. 54 (New city well, drilled by Thorpe Well Co.)
 Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Depth to water: 7 feet

0- 2	Topsoil
2- 42	Sand, fine to medium
42- 44	Clay, light-brown

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Test Hole No. 55 (Drilled by Thorpe Well Co.)
 Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Depth to water: 9 feet

0- 2	Topsoil
2- 42	Sand, fine to medium
42- 47	Clay, light-brown

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Test Hole No. 56 (Drilled by Thorpe Well Co.)
 Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Depth to water: 11 feet

0- 1	Topsoil
1- 42	Sand, fine, some medium
42- 47	Clay, light-brown

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Test Hole No. 57 (Drilled by the City Council)
 Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Depth to water: 8 feet

0- 2	Topsoil
2- 42	Sand, fine to medium
42- 43	Clay, light-brown

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Test Hole No. 58
 Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Surface elevation: 2310 feet
 Depth to water: 7 feet

0- 7	Sand, dark-brown, fine to medium
7- 37	Sand, tan, fine to medium, some clay
37- 49	Shale, yellowish-brown, with black chunks of shale

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Test Hole No. 59 (Drilled by Dreyer Well Driller)
 Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Depth to water: 7 feet

0- 2	Topsoil
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Test Hole No. 59 -- continued.

2- 7	Sand, dark-brown, fine to medium
7- 37	Sand, tan, fine to medium, some clay
37- 42	Clay, yellowish-brown

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Test Hole No. 60 (Drilled by Dreyer Well Driller)
 Location: NE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Depth to water: 9 feet

0- 2	Topsoil
2- 9	Sand, medium
9- 33	Sand, light-brown, fine to medium, some clay
33- 40	Clay, brown

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Test Hole No. 61
 Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Surface elevation: 2301 feet
 Depth to water: 4 feet

0- 4	Sand, light-brown, fine to medium
4- 29	Sand, tan, fine to medium, little or no clay
29- 39	Clay, yellowish-brown

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Test Hole No. 62
 Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Surface elevation: 2293 feet
 Depth to water: 6 feet

0- 6	Sand, light-brown, medium
6- 11	Sand, light-gray, medium
11- 21	Sand, light-brown, medium
21- 29	Clay, yellowish-brown

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Test Hole No. 63
 Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Surface elevation: 2289 feet
 Depth to water: 5 feet

0- 9	Sand, brown, medium
9- 23	Sand, fine to medium
23- 34	Clay, brown

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Test Hole No. 64
 Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.
 Surface elevation: 2311 feet

Test Hole No. 64 -- continued.

Depth to water: dry

0- 3	Sand, light-brown, medium
3- 19	Clay, brown
19- 24	Clay, brownish-gray

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Test Hole No. 65

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.

Surface elevation: 2307 feet

Depth to water: 5 feet

0- 5	Sand, light-brown, medium
5- 14	Sand, tan, fine
14- 21	Sand, tan, medium
21- 44	Clay, brownish-yellow, some pebbles

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Test Hole No. 66

Location: NE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.

Surface elevation: 2342 feet

Depth to water: 22 feet

0- 2	Topsoil
2- 14	Sand, fine to medium, some clay
14- 34	Sand, tan, medium, some clay
34- 57	Sand, tan, medium to coarse
57- 64	Clay, yellowish-brown

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Test Hole No. 67

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.

Surface elevation: 2376 feet

Depth to water: 61 feet

0- 2	Sand, brown, fine to medium
2- 18	Sand, tan, clayey, some pebbles
18- 74	Sand, tan, medium
74- 90	Sand, brown, medium to coarse, little or no clay
90- 93	Clay, dark reddish-brown

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Test Hole No. 68

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.

Surface elevation: 2345 feet

Depth to water: 19 feet

0- 2	Topsoil
2- 39	Sand, medium

Test Hole No. 68 -- continued.

39- 49 Shale, brown
 49- 54 Shale, brown, some pebbles

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Test Hole No. 69

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.

Surface elevation: 2331 feet

Depth to water: 9 feet

0- 5 Sand, light-brown, medium
 5- 7 Sand, gray
 7- 21 Sand, light-gray, becoming fine
 21- 29 Sand, light-brown, fine, with clay
 29- 35 Sand and clay, light-brown, becoming very fine
 35- 44 Shale, light-brown

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Test Hole No. 70

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.

Surface elevation: 2315 feet

Depth to water: dry

0- 4 Clay, light-brown
 4- 36 Clay, olive green
 36- 44 Clay, brownish-gray (weathered shale?)

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Test Hole No. 71

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 6, T. 97 N., R. 75 W.

Depth to water: dry

0- 7 Sand, light-brown
 7- 11 Sand, light-gray
 11- 14 Clay, dark-brown, sandy
 14- 24 Clay, yellowish-brown

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Test Hole No. 72

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 6, T. 97 N., R. 75 W.

Depth to water: dry

0- 4 Sand, brown, fine to medium
 4- 15 Sand, light-brown, clayey
 15- 19 Shale, black

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Test Hole No. 73

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 6, T. 97 N., R. 75 W.

Depth to water: 24 feet

Test Hole No. 73 – continued.

0- 4	Sand, medium
4- 9	Clay, some fine sand grains
9- 14	Clay, no sand
14- 19	Clay, olive
19- 24	Clay, brown (weathered shale?)

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Test Hole No. 74

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 97 N., R. 75 W.

Depth to water: 10 feet

0- 9	Sand, light-brown, medium
9- 14	Sand, fine
14- 19	Sand, fine, some clay
19- 24	Clay
24- 29	Shale

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Test Hole No. 75

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 97 N., R. 75 W.

Depth to water: 15 feet

0- 14	Sand, light-brown, medium
14- 29	Clay, dark-gray
29- 39	Shale, brown, very hard drilling
39- 44	Shale, dark-gray
44- 49	Shale, black

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Test Hole No. 76

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 97 N., R. 75 W.

Surface elevation: 2321 feet

Depth to water: dry

0- 2	Topsoil
2- 11	Clay, dark-brown, some pebbles
11- 14	Shale, yellowish-brown

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Test Hole No. 77

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 6, T. 97 N., R. 75 W.

Depth to water: dry

0- 2	Topsoil
2- 23	Clay, tan
23- 28	Clay, gray
28- 34	Shale, black

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Test Hole No. 78

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 5, T. 97 N., R. 75 W.

Depth to water: dry

0- 4	Clay, very sandy
4- 9	Clay, with pebbles
9- 19	Clay, brown, few pebbles
19- 34	Clay, no pebbles
34- 39	Shale, gray

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Test Hole No. 79

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 5, T. 97 N., R. 75 W.

Depth to water: dry

0- 5	Clay, light-brownish-gray, few pebbles
5- 24	Clay, brown
24- 29	Shale, black

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Test Hole No. 80

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 5, T. 97 N., R. 75 W.

Depth to water: dry

0- 3	Sand, medium
3- 12	Clay, light-brown, sandy
12- 29	Clay, brown
29- 39	Clay, black

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Test Hole No. 81

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 5, T. 97 N., R. 75 W.

Depth to water: dry

0- 2	Topsoil
2- 18	Clay, brown
18- 24	Clay, gray, some pebbles

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Test Hole No. 82

Location: NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 5, T. 97 N., R. 75 W.

Depth to water: dry

0- 4	Clay, brownish-black, sandy
4- 13	Clay, dark-brown
13- 23	Clay, brownish-yellow
23- 34	Shale, black

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Test Hole No. 83

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 4, T. 97 N., R. 75 W.

Test Hole No. 83 – continued.

Depth to water: dry

0- 7	Clay, brown, sandy
7- 14	Clay, brown
14- 19	Shale, black

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Test Hole No. 84

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 3, T. 97 N., R. 75 W.

Depth to water: dry

0- 5	Clay, dark-brown, sandy
5- 16	Clay, light-brown, sandy
16- 24	Shale, black

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Test Hole No. 85

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 97 N., R. 75 W.

Depth to water: dry

0- 9	Clay, dark-brown
9- 17	Clay, light-brown
17- 23	Clay, yellowish-brown
23- 24	Shale, black

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Test Hole No. 86

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 97 N., R. 75 W.

Depth to water: dry

0- 3	Clay, dark-brown
3- 18	Clay, light-brown
18- 26	Shale, weathered
26- 29	Shale, black

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Test Hole No. 87

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 3, T. 97 N., R. 75 W.

Depth to water: dry

0- 2	Topsoil
2- 16	Clay, dark-brown, some pebbles
16- 18	Clay, yellowish-brown
18- 24	Shale, black

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Test Hole No. 88

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 1, T. 97 N., R. 75 W.

Depth to water: dry

Test Hole No. 88 – continued.

0- 4	Topsoil, sandy
4- 29	Clay, tan, sandy
29- 39	Clay, dark-brown, grading to black shale

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Test Hole No. 89

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 10, T. 97 N., R. 76 W.

Depth to water: 38 feet

0- 19	Sand, tan, medium
19- 38	Sand, tan, medium, little clay
38- 49	Sand, brown, medium, some clay
49- 63	Sand, brown, fine to medium, some clay
63- 69	Clay, greenish-brown, some pebbles

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Test Hole No. 90

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 10, T. 97 N., R. 76 W.

Depth to water: 12 feet

0- 12	Sand, dark-brown, medium, some clay
12- 17	Sand, tan, medium, some clay
17- 47	Sand, tan, little clay
47- 59	Clay, reddish-brown, very compact

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Test Hole No. 91

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 10, T. 97 N., R. 76 W.

Surface elevation: 2337 feet

Depth to water: 22 feet

0- 4	Roadbed
4- 16	Sand, light-brown, fine to medium
16- 34	Sand, tan, medium, some clay
34- 58	Sand, tan, medium
58- 79	Clay, reddish-brown, very compacted

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Test Hole No. 92

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2325 feet

Depth to water: 17 feet

0- 2	Topsoil
2- 14	Sand, light-brown, fine to medium
14- 53	Sand, tan, fine to medium, little clay
53- 64	Clay, dark-brown, some pebbles

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Test Hole No. 93

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2319 feet

Depth to water: 5 feet

0- 3	Topsoil, sandy
3- 9	Sand, dark-brown, medium, clean
9- 51	Sand, tan, medium, some coarser grains, little or no clay
51- 60	Clay, tannish-brown
60- 64	Clay, black, some brown chunks of shale

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Test Hole No. 94

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2328 feet

Depth to water: 7 feet

0- 2	Topsoil
2- 7	Sand, dark-brown, fine to medium
7- 39	Sand, light-gray, fine to medium
39- 52	Sand, dark-brown, medium, clean
52- 64	Clay, brown, some pebbles

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Test Hole No. 95

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2333 feet

Depth to water: 5 feet

0- 5	Sand, black, some clay
5- 11	Sand, tan, fine to medium, some clay
11- 28	Sand, tan, less clay
28- 39	Clay, brown, some pebbles, some dark chunks of shale

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Test Hole No. 96

Location: NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2330 feet

Depth to water: 7 feet

0- 2	Topsoil
2- 58	Sand, tan, fine to medium, some clay
58- 66	Clay, white, few pebbles
66- 74	Clay, yellowish-brown, some dark patches

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Test Hole No. 97

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2327 feet

Depth to water: 1 foot

Test Hole No. 97 -- continued.

0- 1	Topsoil
1- 3	Sand and clay
3- 41	Sand, fine to medium
41- 54	Clay, yellowish-brown, some dark chunks of shale

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Test Hole No. 98

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2330 feet

Depth to water: 11 feet

0- 6	Sand, dark-brown, fine to medium
6- 35	Sand, light-brown, fine to medium
35- 52	Sand, gray, medium, little or no clay
52- 64	Clay, brown, some pebbles

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Test Hole No. 99

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2328 feet

Depth to water: 3 feet

0- 1	Topsoil
1- 14	Sand, light-brown, medium
14- 34	Sand, tan, fine to medium, some clay
34- 55	Sand, tan, fine to medium, little clay
55- 69	Clay, greenish-tan, some pebbles

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Test Hole No. 100

Location: NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2314 feet

Depth to water: 1 foot

0- 1	Topsoil
1- 39	Sand, gray, with clay
39- 45	Sand, brown, fine to medium
45- 59	Clay, brownish-red

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Test Hole No. 101

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2332 feet

Depth to water: 16 feet

0- 16	Sand, tan, fine to medium
16- 26	Sand, medium, clean
26- 62	Sand, medium to fine
62- 86	Clay, white, sandy
86- 94	Clay, reddish-brown, very compact

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Test Hole No. 102

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2308 feet

Depth to water: 3 feet

0- 3	Topsoil, sandy
3- 24	Sand, light-gray, fine
24- 37	Sand, brown
37- 54	Clay, reddish-brown, compact

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Test Hole No. 103

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.

Surface elevation: 2308 feet

Depth to water: 2 feet

0- 2	Topsoil
2- 33	Sand, light-gray, fine to medium, some clay
33- 49	Clay, tan, reddish-tan

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Test Hole No. 104

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: not measured

Depth to water: 10 feet

0- 2	Topsoil
2- 10	Sand, tan, fine to medium
10- 47	Sand, tan, some clay
47- 54	Clay, yellowish-brown

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Test Hole No. 105

Location: NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: 2327 feet

Depth to water: 6 feet

0- 2	Topsoil
2- 4	Sand, brown, some clay
4- 6	Sand, brown, clayey
6- 39	Sand, greenish-gray, fine to medium, some clay
39- 52	Sand, light-brown, medium
52- 54	Shale, reddish-brown, with black chunks of shale

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Test Hole No. 106

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: 2382 feet

Depth to water: 79 feet?

0- 3	Sand, brown, medium
3- 12	Sand, clayey, compact

Test Hole No. 106 – continued.

12- 79 Sand, light-brown, medium
 79-113 Sand, medium
 113-124 Clay, light-brown, some pebbles

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Test Hole No. 107

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: 2358 feet

Depth to water: 36 feet

0- 3 Topsoil
 3- 36 Sand, light-brown, fine to medium
 36- 82 Sand, tan, fine to medium, little or no clay
 82- 94 Clay, white, grading to reddish-brown, very compact

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Test Hole No. 108

Location: NW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: 2333 feet

Depth to water: 4 feet

0- 1 Topsoil
 1- 43 Sand, light-brown, medium
 43- 57 Clay, tan, sandy
 57- 59 Clay, reddish-green, very tough drilling

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Test Hole No. 109

Location: NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: 2330 feet

Depth to water: 3 feet

0- 3 Topsoil
 3- 21 Sand, tan, fine to medium
 21- 30 Sand, black, large amount of clay
 30- 42 Sand, brown, fine to medium
 42- 50 Clay, reddish-brown, some pebbles
 50- 61 Clay, yellowish-brown (shale)

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Test Hole No. 110

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: 2373 feet

Depth to water: 58 feet

0- 4 Clay, sandy
 4- 58 Sand, tan, fine to medium
 58- 78 Sand, tan, fine to medium, some clay
 78- 89 Clay, yellowish-brown, some pebbles

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Test Hole No. 111

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: 2383 feet

Depth to water: 64 feet

0- 6	Sand, light-brown, medium
6- 22	Clay, sandy
22- 64	Sand, tan, medium
64- 84	Sand, light-brown, medium
84- 92	Sand, tan, fine to medium
92-114	Clay, brown, some pebbles

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Test Hole No. 112

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: 2353 feet

Depth to water: 32 feet

0- 2	Topsoil
2- 32	Sand, light-brown, fine to medium
32- 43	Sand, tan, fine to medium, some clay
43- 54	Clay, yellowish-brown, some pebbles

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Test Hole No. 113

Location: NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.

Surface elevation: 2330 feet

Depth to water: 4 feet

0- 1	Topsoil
1- 4	Sand, brown, medium
4- 14	Sand, tannish-gray, some clay
14- 42	Sand, dark-gray, some clay
42- 49	Clay, yellowish-brown

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Test Hole No. 114

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 7, T. 97 N., R. 75 W.

Surface elevation: 2313 feet

Depth to water: 4 feet

0- 4	Roadbed
4- 19	Sand, dark-gray, medium, contains some clay
19- 26	Sand, light-gray, more clay
26- 34	Clay, reddish-brown, sandy
34- 39	Clay, brown, some pebbles

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Test Hole No. 115

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 7, T. 97 N., R. 75 W.

Depth to water: 2 feet

Test Hole No. 115 – continued.

0- 2	Topsoil, sandy
2- 11	Sand, brownish-gray, fine to medium
11- 19	Shale, black

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Test Hole No. 116

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 7, T. 97 N., R. 75 W.

Depth to water: 29 feet

0- 2	Topsoil
2- 7	Sand, medium, well sorted
7- 14	Clay, sandy
14- 22	Clay, light-gray
22- 29	Shale, black

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Test Hole No. 117

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 7, T. 97 N., R. 75 W.

Depth to water: dry

0- 5	Sand, dark-brown, fine to medium
5- 25	Clay, yellowish-brown
25- 29	Clay, yellowish-brown, some dark chunks of shale

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Test Hole No. 118

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 7, T. 97 N., R. 75 W.

Depth to water: 15 feet

0- 2	Topsoil
2- 20	Sand, light-brown, fine to medium
20- 29	Clay, dark-gray, some pebbles, grades to black shale

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Test Hole No. 119

Location: NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 97 N., R. 75 W.

Depth to water: dry

0- 5	Sand, dark-brown, medium
5- 9	Sand, dark-gray, medium
9- 17	Clay, light-brown, sandy
17- 24	Clay, silver-gray, sandy
24- 29	Shale, black

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Test Hole No. 120

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 10, T. 97 N., R. 75 W.

Depth to water: dry

Test Hole No. 120 – continued.

0- 2	Topsoil
2- 19	Clay, brown
19- 24	Shale, black

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Test Hole No. 121

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T. 97 N., R. 75 W.

Depth to water: dry

0- 4	Roadbed
4- 12	Clay, brown, sandy, hard to drill
12- 22	Clay, dark-brown
22- 29	Shale, dark-gray

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Test Hole No. 122

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 16, T. 97 N., R. 76 W.

Depth to water: 57 feet

0- 4	Roadbed
4- 6	Clay, dark-gray, sandy
6- 57	Sand, fine to medium
57- 63	Sand, light-brown, fine to medium
63- 69	Clay, brown, many pebbles

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Test Hole No. 123

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 15, T. 97 N., R. 76 W.

Depth to water: 8 feet

0- 4	Roadbed
4- 29	Sand, light-brown, medium
29- 41	Sand, dark-gray, fine
41- 71	Sand, tan, fine to medium
71- 76	Clay, greenish-gray
76- 86	Clay, reddish-brown
86- 89	Clay, light-brown, compact

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Test Hole No. 124

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 14, T. 97 N., R. 76 W.

Surface elevation: 2330 feet

Depth to water: 4 feet

0- 4	Roadbed
4- 52	Sand, dark-brown, fine to medium, some clay
52- 59	Clay, red changing to green, very tough drilling

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Test Hole No. 125

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 14, T. 97 N., R. 76 W.

Depth to water: dry

0- 4	Roadbed
4- 12	Sand, tan, fine to medium
12- 26	Sand, tan, medium, little or no clay
26- 39	Clay, tan, very tough drilling

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Test Hole No. 126

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 14, T. 97 N., R. 76 W.

Depth to water: 36 feet

0- 4	Roadbed
4- 6	Clay, tan, sandy
6- 26	Sand, tan, cemented layers
26- 36	Clay, sandy
36- 62	Sand, fine to medium, some clay
62- 74	Clay, yellowish-brown

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Test Hole No. 127

Location: NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13, T. 97 N., R. 76 W.

Surface elevation: 2343 feet

Depth of water: 17 feet

0- 2	Roadbed
2- 17	Sand, brown, medium
17- 64	Sand, tan, fine to medium
64- 74	Clay, brownish-yellow

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Test Hole No. 128

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 13, T. 97 N., R. 76 W.

Depth to water: 21 feet

0- 2	Sand, dark-brown, fine to medium
2- 6	Sand, tan
6- 9	Clay, some sand
9- 36	Sand, light-tan, some clay
36- 48	Clay, yellowish-brown
48- 64	Clay, brown, some pebbles

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Test Hole No. 129

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, T. 97 N., R. 76 W.

Depth to water: 12 feet

0- 12	Sand, light-brown, medium
12- 19	Sand, tan, some clay
19- 24	Sand?

Test Hole 129 – continued.

24- 31 Sand, fine, contains some clay
 31- 54 Clay, yellowish-brown

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Test Hole No. 130

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, T. 97 N., R. 76 W.

Depth to water: 6 feet

0- 3 Topsoil
 3- 19 Sand, dark-brown, medium
 19- 44 Sand, tan, fine, some clay
 44- 59 Clay, brown, compact

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Test Hole No. 131

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, T. 97 N., R. 76 W.

Depth to water: 4 feet

0- 4 Topsoil
 4- 34 Sand, gray, fine to medium
 34- 44 Clay, greenish-gray, some pebbles

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Test Hole No. 132

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 97 N., R. 76 W.

Depth to water: 6 feet

0- 6 Sand, brown, medium
 6- 37 Sand, tan, fine to medium
 37- 43 Clay, reddish-tan
 43- 49 Clay, brown

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Test Hole No. 133

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 97 N., R. 76 W.

Surface elevation: 2326 feet

Depth to water: 4 feet

0- 4 Roadbed
 4- 14 Sand, dark-brown, medium, some clay
 14- 42 Sand, dark-brown, fine, some clay
 42- 49 Clay, tan

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Test Hole No. 134

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 18, T. 97 N., R. 75 W.

Depth to water: 4 feet

0- 4 Roadbed
 4- 17 Sand, dark-gray, fine to medium, very clayey

Test Hole No. 134 -- continued.

17- 29	Sand, tan, medium
29- 40	Clay, reddish-brown, compacted
40- 44	Clay, yellowish-brown, some pebbles

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Test Hole No. 135

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 18, T. 97 N., R. 75 W.

Depth to water: 7 feet

0- 2	Roadbed
2- 7	Sand, dark-brown, medium
7- 17	Sand, light-gray, medium
17- 30	Sand, dark-gray
30- 36	Sand, tan, some clay
36- 49	Clay, reddish-brown, some pebbles

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Test Hole No. 136

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 17, T. 97 N., R. 75 W.

Depth to water: 29 feet

0- 4	Topsoil
4- 38	Sand, light-brown, fine to medium
38- 49	Clay, yellowish-brown, some pebbles

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Test Hole No. 137

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 17, T. 97 N., R. 75 W.

Depth to water: not measured

0- 4	Roadbed
4- 9	Sand, brown, fine
9- 18	Clay, yellowish-brown
18- 24	Clay, yellowish-brown, some gray chunks of shale

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Test Hole No. 138

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 16, T. 97 N., R. 75 W.

Depth to water: 12 feet

0- 1	Topsoil
1- 6	Clay, brown
6- 17	Clay, light-green
17- 29	Shale, yellowish-brown

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Test Hole No. 139

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 16, T. 97 N., R. 75 W.

Depth to water: dry

Test Hole No. 139 – continued.

0- 4	Sand, light-brown, medium
4- 10	Clay, dark-gray
10- 12	Shale, yellowish-brown (weathered)
12- 14	Shale, black

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Test Hole No. 140

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 16, T. 97 N., R. 75 W.

Depth to water: 5 feet

0- 4	Clay, dark-brown, sandy
4- 10	Clay, brown
10- 15	Shale, yellowish-brown (weathered)
15- 19	Shale, black, some yellow chunks of clay

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Test Hole No. 141

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 27, T. 97 N., R. 76 W.

Depth to water: 34 feet

0- 4	Roadbed
4- 17	Sand, light-brown, fine to medium
17- 34	Clay, tan, sandy, tough drilling
34- 42	Sand, tan, fine
42-101	Sand, tan, medium, little clay
101-104	Clay, grayish-tan, few pebbles

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Test Hole No. 142

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 23, T. 97 N., R. 76 W.

Depth to water: 18 feet

0- 7	Sand, dark-brown, medium
7- 18	Sand, light-brown, medium
18- 94	Sand, tan, medium
94-114	Clay, brown

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Test Hole No. 143

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 23, T. 97 N., R. 76 W.

Depth to water: 17 feet

0- 4	Sand, dark-brown, medium
4- 60	Sand, tan, medium
60- 77	Sand, tan, fine
77- 94	Clay, tan

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Test Hole No. 144

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 25, T. 97 N., R. 76 W.

Depth to water: 5 feet

0- 5	Sand, light-brown, medium
5- 30	Sand, tan
30- 41	Sand, cemented
41- 66	Sand, tan, fine to medium
66- 79	Clay, sandy
79- 89	Clay, yellowish-brown, contains pebbles

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Test Hole No. 145

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 25, T. 97 N., R. 76 W.

Depth to water: 22 feet

0- 2	Topsoil
2- 22	Sand, tan, fine to medium
22- 45	Sand, tannish-gray, fine
45- 49	Clay, very compact

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Test Hole No. 146

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 29, T. 97 N., R. 75 W.

Depth to water: 7 feet

0- 6	Roadbed
6- 21	Sand, light-brown, medium
21- 25	Clay, greenish-tan, sandy
25- 34	Shale, yellowish-brown

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Test Hole No. 147

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 29, T. 97 N., R. 75 W.

Depth to water: 5 feet

0- 5	Sand, brown, fine to medium
5- 9	Sand, dark-brown, fine grains
9- 19	Shale, light-brown

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Test Hole No. 148

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 21, T. 97 N., R. 75 W.

Depth to water: 16 feet

0- 2	Topsoil
2- 12	Clay, tan
12- 19	Shale, black

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Test Hole No. 149

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 21, T. 97 N., R. 75 W.

Depth to water: 3 feet

0- 3	Sand, dark-gray
3- 21	Sand, tan, fine to medium
21- 34	Shale, brownish-yellow

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Test Hole No. 150

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 21, T. 97 N., R. 75 W.

Depth to water: 2 feet

0- 2	Clay, black, sandy
2- 8	Sand, tannish-gray, medium
8- 24	Clay, tan

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Test Hole No. 151

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 21, T. 97 N., R. 75 W.

Depth to water: 2 feet

0- 2	Topsoil
2- 4	Sand, light-gray, medium
4- 12	Clay, brownish-gray
12- 24	Clay, light-brown, some pebbles

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Test Hole No. 152

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 22, T. 97 N., R. 75 W.

Depth to water: 2 feet

0- 2	Sand, light-brown, fine to medium
2- 7	Sand, gray
7- 14	Clay, yellowish-brown

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Test Hole No. 153

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 22, T. 97 N., R. 75 W.

Depth to water: 12 feet

0- 3	Sand, light-brown, medium
3- 22	Clay, brown, sandy
22- 34	Clay, gray, with yellow chunks of clay

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Test Hole No. 154

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 21, T. 97 N., R. 75 W.

Depth to water: 9 feet

0- 9	Clay and sand, light-brown
9- 14	Sand, light-brown, with clay
14- 19	Shale, yellowish-green

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APPENDIX B

Well records in the Colome area

Source: A, Alluvium; O, Ogallala Group; C, Varicolored Clay; P, Pierre Shale

Use: D, domestic; S, stock.

Name	Location	Depth of Well (feet)	Depth to Water (feet)	Source	Use
Vobr, L.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 2, T. 97 N., R. 75 W.	20	10	P	S
Vobr, L.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 2, T. 97 N., R. 75 W.	60	30	P	D,S
Johnson, K.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 97 N., R. 75 W.	28	10?	C,P	S
Johnson, K.	SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 97 N., R. 74 W.	35		C,P	S
Johnson, K.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 97 N., R. 74 W.	50		C,P	S
Vavra, F.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 5, T. 97 N., R. 74 W.	32	15	O,C	D,S
Atteberry, R.	NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 5, T. 97 N., R. 74 W.	30	6	O,C,P	D,S
Borland, E.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 7, T. 97 N., R. 75 W.	38	5	O	D
Martz, G.	SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 7, T. 97 N., R. 75 W.	35	8	O	S
Schultz, L.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 7, T. 97 N., R. 75 W.	72	30	O,C,P	S
Martz, G.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 8, T. 97 N., R. 75 W.	60	14	O,C,P	D,S
Atteberry, R.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 8, T. 97 N., R. 74 W.	60	30	C,P	S
Kalenda, R.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 9, T. 97 N., R. 74 W.	42	6	C,P	D,S
Atteberry R.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 9, T. 97 N., R. 75 W.	35	8	C,P	S

Name	Location	Depth of Well (feet)	Depth to Water (feet)	Source	Use
Sorber, H.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 10, T. 97 N., R. 75 W.	65	15	P	D,S
Bertran, H.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 10, T. 97 N., R. 74 W.	50	12	O	D,S
Dedlow, E.	NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 14, T. 97 N., R. 74 W.	22	6	O,C	D,S
Baldwin, O.	NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 17, T. 97 N., R. 74 W.	25	10	O,C	D
Fries, L.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 17, T. 97 N., R. 74 W.	40	15	P	D,S
Bigelow, R.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 17, T. 97 N., R. 75 W.	60	10	O,C,P	D,S
Zimmerman, R.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 18, T. 97 N., R. 74 W.	22	10	O	D,S
Zimmerman, R.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 18, T. 97 N., R. 74 W.	28	5	O	S
Schultz, C.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 18, T. 97 N., R. 75 W.	40		O,C	D,S
McFarland, T.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 19, T. 97 N., R. 75 W.	38	7	O,C	D,S
Steinke, D.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 20, T. 97 N., R. 74 W.	40	10	O,C	D,S
Bigelow, J.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 97 N., R. 74 W.	30	10	O,C	D,S
Bigelow, J.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 97 N., R. 74 W.	60	15	O,C,P	D,S
Cahoy, M.	SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 22, T. 97 N., R. 74 W.	50		C,P	D,S
Fetzer, M.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 23, T. 97 N., R. 74 W.	20	14	P	D,S
Fetzer, M.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 23, T. 97 N., R. 74 W.	27	10	A,P	S
Fetzer, H.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 23, T. 97 N., R. 75 W.	18	11	O,C	D,S

Name	Location	Depth of Well (feet)	Depth to Water (feet)	Source	Use
Jorgensen, J.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.	35	12	O	D,S
Hermesen, D.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 1, T. 97 N., R. 76 W.	35		O	S
Sand, F.	NW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 2, T. 97 N., R. 76 W.	20	10	O	S
Sand, F.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 10, T. 97 N., R. 76 W.	65	40	O	S
Sand, F.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 10, T. 97 N., R. 76 W.	30	15	O	S
Snethen, R.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.	30	8	O	D,S
Snethen, R.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.	70	15	O	S
Fetzer, H.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, T. 97 N., R. 76 W.	44	5	O	S
Fetzer, M.	NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.	20	8	O	
Hermesen, D.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 97 N., R. 76 W.	50		O	D
Menthey, M.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, T. 97 N., R. 76 W.	42	26	O	D,S
School House	NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 14, T. 97 N., R. 76 W.			O	D
Nielsen, C.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 23, T. 97 N., R. 76 W.	90		O	S
Harrod, A. and V.	NW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 23, T. 97 N., R. 76 W.	49	11	O	S
Manthey, J.	NW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 25, T. 97 N., R. 76 W.	30	15	O	D,S
Nance, J.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 28, T. 98 N., R. 75 W.	60		P	D,S
Nieman, J.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30, T. 98 N., R. 75 W.	22	5	P	D,S

Name	Location	Depth of Well (feet)	Depth to Water (feet)	Source	Use
Brown, W.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 32, T. 98 N., R. 75 W.	42	20	P	D,S
Atteberry, R.	SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 33, T. 98 N., R. 75 W.	60		P	
Dohmen, J.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 33, T. 98 N., R. 75 W.	14		O	D,S
Evans, D	NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 34, T. 98 N., R. 75 W.	50		P	D,S