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SAND AND GRAVEL RESOURCES IN
TURNER COUNTY, SOUTH DAKOTA

by

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and Turner County

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ILLUSTRATION

Map showing test holes, gravel pits, quartzite exposures and sand and gravel deposits, in Turner County, South Dakota	Facing 70
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INTRODUCTION

This pamphlet is the first in a series of reports describing the geology and water resources of Turner County. It is designed to indicate the most promising areas in which to search for aggregate material. Quality of the deposits encountered was not analyzed, nor was the quantity of available reserves measured, as these would require prior knowledge of the material specifications for each intended use.

Other reports in the series include:

- a. Major aquifers in Hutchinson and Turner Counties, South Dakota: South Dakota Geological Survey, Information Pamphlet, Lindgren, R., U.S. Geological Survey, (in preparation).
- b. Water resources of Hutchinson and Turner Counties, South Dakota: United States Geological Survey, Water Resources Investigations Report, Lindgren, R. (in preparation).
- c. Geology of Hutchinson and Turner Counties, South Dakota: South Dakota Geological Survey, Bulletin, Duchossois, G. E. (in preparation).

The first report contains a generalized evaluation of the yield, quality, and location of major aquifers (water-bearing deposits), in a condensed, easy-to-read pamphlet. The second and third reports are more technical and present a more comprehensive investigation of the geology and water resources within the two-County area. All basic data used to compile these reports are available from the South Dakota Geological Survey's open file.

It is recommended that the following publication, explaining how aggregate-bearing landforms are recognized, be used as a companion reference to this pamphlet:

Evaluation of exploration methods for coarse aggregate in eastern South Dakota: South Dakota Geological Survey, Report of Investigations 95, Bruce, R. L., and Lundberg, B. E., 1964.

GEOLOGIC OVERVIEW

The topography of Turner County exemplifies youthful glacial terrain, namely rolling hills and valleys with many knobs and sloughs. Most sand and gravel deposits were formed by glacial processes associated with the glaciers that covered this region thousands of years ago, late in the Pleistocene Epoch. Others have been deposited by streams since the glaciers retreated. The following brief description of geologic terms should be used as an aid in further understanding the deposition of sand and gravel.

Till

Till is the term used to define the unsorted and unstratified material either laid down by an active glacier at the base of the ice, or deposited by a glacier as the ice melted. This mixture of boulders, sand, gravel, clay, and silt is often called "boulder clay" or "blue clay." Although till covers most of Turner County, it is not considered a source of sand and gravel, as at best, only a few, small isolated lenses occur.

Outwash

Glacial outwash is a general term geologists use to describe any deposits of clay, silt, sand, gravel, or boulders that have been washed, sorted, and subsequently deposited by flowing glacial meltwater. Outwash grain size depends upon sediment type and velocity of the water that transported and deposited the material. A lake or slowly flowing stream will usually deposit silts and clays while rapidly flowing water may leave stream beds composed almost entirely of boulders. Most outwash, however, is a mixture of material between these two extremes, and is composed of an assortment of sand and gravel with minor amounts of finer and coarser materials. The majority of the colored areas on the map included in this publication indicate outwash deposits.

Alluvium

Alluvium is the term used to describe a mixture of clays, silts, sands, and gravels deposited by streams since the retreat of the glaciers. The size of material found in any one deposit is dependent on the same factors that determine grain size in glacial outwash. Alluvium occurs in the valleys of present day streams, and where deposits consist primarily of sand and gravel, mining for construction materials may take place.

Terrace Deposits

Terrace deposits are flat-topped, fluvial deposits that may or may not be of glacial origin. Being remnants of former floodplains, streams that formed them have since cut their channels deeper and developed new floodplains at lower elevations. These alluvial or outwash deposits account for many of the aggregate deposits found in Turner County.

Bedrock

Bedrock is the older, consolidated rock beneath the glacial deposits. In Turner County, the bedrock consists of shale, sandstone, chalk, and quartzite (locally known as "pink granite"). The quartzite is the only bedrock exposed in Turner County. Quartzite exposures occur along portions of both the East and

West Forks of the Vermillion River. Quartzite outcrops were mapped during this study because they are potential sources of high quality aggregate. Generally, when bedrock units are found at or near the ground surface, no sand and gravel exists below that point.

EXPLANATION OF TABLES

Table 1 is a compilation of test holes that encountered sand or gravel in the upper 25 feet. This table lists:

- a. Location of the test hole,
- b. Depth of hole, and
- c. Description of aggregate encountered.

The South Dakota Geological Survey, United States Geological Survey, South Dakota Division of Water Rights, United States Bureau of Reclamation, and private drillers contributed to the formation of this list. The complete set of test-hole logs is on file at the Office of the South Dakota Geological Survey in Vermillion.

Table 2 is a list of gravel pits on file with the South Dakota Division of Highways, Mitchell. The owner, material type, and where possible, thickness of overburden and aggregate being mined, have been listed. The actual thickness of a deposit may be greater than that mined, as depth to the water table, changing material characteristics, or available mining equipment may limit excavation.

EXPLANATION OF MAP

The map shows the location of gravel pits (active and inactive), test holes, and a few landmarks. Test holes are represented by three types of symbols. A closed circle (●) indicates the presence of sand or gravel within 25 feet of the land surface, with 5 feet or less of overburden. A square (■) indicates that sand or gravel was encountered within 25 feet of the land surface, but that more than 5 feet of overburden existed. The test holes represented by these symbols are numbered and listed in table 1. An open circle (○) indicates that no sand and/or gravel was found in the upper 25 feet.

Gravel pits are labelled with a crossed pick and shovel (⌘), those numbered, being listed in table 2. Additional information concerning the numbered gravel pits is on file at the Division of Highways District Office in Mitchell, South Dakota.

To help illustrate the most promising areas, the map has been divided into three area types, each expressing the probability of

discovering new sources of economically extractable sand or gravel. Those areas designated as "good" indicate a comparatively thick deposit with thin overburden and underlying large tracts of land. Those considered "fair" lack one or more of these favorable attributes. Areas designated as "good" or "fair" have been assigned a color as well as a letter, and are discussed later in the text.

Areas designated as poor are composed mainly of till but may contain random deposits of sand and gravel. Many of these deposits have been located by test holes and gravel pits on the map, and some of the pits in these areas are very productive. However, these deposits are generally limited and difficult to locate.

The above three classifications evolved through an extensive drilling program, the study of soil types, the study of gravel pits and their locations, topographic map and aerial photograph interpretations, and field observations.

Sand and Gravel

Area "A" (designated "fair") contains deposits up to 30 feet thick, but on average they are covered by over 10 feet of overburden. In the northern half of this area, deposits are primarily glacially derived sands and silts. In the southern half, fine gravel dominates the outwash deposits.

Area "B" (designated "good") represents one of the largest aggregate bodies found in eastern South Dakota. It covers over 50 square miles with an average depth of about 45 feet and total depth up to 90 feet. The only inhibiting factor in the development of this resource is the relatively high water table necessitating the use of dredging equipment in any mining operation. The main portion of the aggregate body is found to the southeast of the City of Parker. Geologically known as an outwash plain, the aggregate fills an irregularly shaped basin-like depression, which is most likely a portion of a pre-glacial river valley (Tipton, 1957, p. 4). The deposits blanket the entire valley, except for occasional flat topped till hummocks scattered throughout the area. Although this outwash plain has been extensively developed, only a small percentage of the available resource has, as yet, been utilized. The aggregate found to the north of the City of Parker is concentrated along the East and West Forks of the Vermillion River. Gravel pits exist on both the floodplain as well as on older terrace remnants. Deposits up to 45 feet in depth, with generally less than 5 feet of overburden were encountered by Survey tests in this area.

Area "C" (designated "fair") depicts two forms of aggregate deposition. The northern "arm" represents a glacial disintegration ridge, though due to the large proportion of sand and gravel found within this landform, it is evident that large volumes of meltwater were involved in its formation. This ridge, named Rocky

Ridge, runs northwest into Minnehaha County, with several gravel pits appearing along its length. The southern "arm" follows present day drainage and although sand and gravel does exist, a high water table may inhibit pit development.

Area "D" (designated "fair") represents outwash terraces along Long Creek. Little or no overburden is present and depths of aggregate exceed 15 feet. However, heavy mining development in the 1960's depleted much of the resource available.

Area "E" (designated "fair"). With overburden of more than 10 feet, the northern segment of "E" exemplifies a buried outwash channel. The southern part of "E" also has overburden of more than 10 feet. This area probably represents a slumping of till over the edge of the Parker-Centerville outwash plain (Tipton, 1957, p. 8).

Area "F" (designated "fair"). These deposits constitute the stream deposits and terrace remnants of both the present day, and former channels, of Turkey Ridge Creek. The two northwestern deposits "F1," have little overburden, but due to their fine particulate size and patchy occurrence, development prospects seem remote. The sections comprising "F2" probably represent the remnants of a former Turkey Ridge Creek channel, but due to the rarity and small volume of individual deposits, prospects again seem only "fair" at best. "F3" deposits are terrace deposits, patchy in occurrence and grading to a clean, medium, white sand to the northwest. These sands are probably reworked deposits from the "western derived," Grand Island Formation (Christensen, 1967).

Area "G" (designated "fair"). These glacial stream deposits are thin and often have an overburden of over 5 feet. For the most part they follow the present day Turkey Ridge Creek channel. However, this area has been heavily utilized and remaining deposits may be infrequent and inaccessible.

Area H (designated "fair"). Geologically known as a valley train deposit, this area contains large volumes of aggregate to over 60 feet in depth. Over the majority of the area, overburden is over 5 feet thick. Water tables are high, though possibilities probably do exist for economic development of the resource.

Area "I" (designated "good"). This area contains gravel to over 30 feet in depth, and with an average of less than 1 foot of overburden present, development prospects look favorable. Tipton (1957, p. 8) suggests that this gravel has a different source than that in the outwash plain to the north, since median pebble size differs.

Area "J" (designated "fair"). The few outwash terraces present along this portion of Blind Creek have already been partially developed and further development may prove difficult.

The remainder of Turner County has been mapped as poor though some areas will contain sand and gravel. One example exists in sections 14 and 16 of Township 98 and Range 55. These deposits characterize ice marginal accumulations. Due to the widely scattered nature of such random deposits, exploration efforts should first be concentrated in those areas marked "good" and "fair."

Quartzite

Quartzite outcrops occur along both forks of the Vermillion River. The three southernmost exposures are small, the largest covering only a few square yards. The two northernmost exposures crop out intermittently along several hundred yards of the East Fork. At all five sites it is highly likely that larger masses of rock would be available for quarrying within a few feet of ground surface.

Those exposures to the north of Parker generally exhibit thin horizontal beds (less than 6 inches thick) with very poor cementation of the sand grains, while those to the east of Parker reveal a very well cemented sand grain configuration in 2- to 3-foot thick slabs. Since all of the outcrops occur along or near drainage ways, very little of the quartzite is exposed much above stream levels. This would probably present dewatering problems if quarrying were to take place. One exception exists in the southeast quarter of section 11, Township 99 North, Range 53 West. This exposure is well above the stream level, though still within the floodplain.

Some of the geologic and economic factors to consider in selecting a quarry site include size, quality and jointing of the outcrop, overburden thickness, local water level, development costs, transportation costs, future markets, and material specifications.

SELECTED REFERENCES

- Christensen, C. M., and Stephens, J. C., 1967, Geology and hydrology of Clay County, South Dakota: South Dakota Geol. Survey Bulletin 9, Part I.
- Tipton, M. J., 1957, Geology and hydrology of the Parker-Center-ville outwash: South Dakota Geol. Survey Rept. of Invest. no. 82.

TABLE 1. LIST OF TEST HOLES IN TURNER COUNTY, SOUTH DAKOTA,
WHICH CONTAIN SAND OR GRAVEL IN THE UPPER 25 FEET.

LITHOLOGIC DESCRIPTIONS, AS LISTED, HAVE BEEN CONDENSED FROM
DATA CONTAINED IN LOGS ON FILE AT THE SOUTH DAKOTA GEOLOGICAL
SURVEY OFFICE, VERMILLION, SOUTH DAKOTA, AND CONTAIN ONLY
INFORMATION WHICH HAS BEEN DEEMED MOST USEFUL FOR THIS STUDY.
NUMERICAL VALUES INDICATE DEPTH IN FEET BELOW LAND SURFACE.

TEST HOLE NUMBER: 1
LOCATION: 096N-52W-01BAAA
LEGAL LOCATION: NE NE NE NW SEC. 01, T. 096 N., R. 52 W.

3 - 13 GRAVEL, FINE TO COARSE PEBBLES; WIDE
VARIETY OF ROCK TYPES

* * * *

TEST HOLE NUMBER: 2
LOCATION: 096N-52W-02CAAA
LEGAL LOCATION: NE NE NE SW SEC. 02, T. 096 N., R. 52 W.

0 - 1 GRAVEL, LIGHT-BROWN, CLAYEY; DRY
(ROADFILL)
6 - 35 SAND, BROWN, COARSE, SILTY, CLAYEY,
POORLY SORTED; SATURATED, OXIDIZED,
WITH STRINGERS OF COARSE GRAVEL AT 26
FEET

* * * *

TEST HOLE NUMBER: 3
LOCATION: 096N-52W-02DCCC
LEGAL LOCATION: SW SW SW SE SEC. 02, T. 096 N., R. 52 W.

12 - 41 GRAVEL, GREENISH-GRAY, FINE, POORLY
SORTED, SUBANGULAR; SATURATED

* * * *

TEST HOLE NUMBER: 4
LOCATION: 096N-52W-08BBAA
LEGAL LOCATION: NE NE NW NW SEC. 08, T. 096 N., R. 52 W.

1 - 6 GRAVEL, BROWN, MEDIUM TO COARSE, WELL-
ROUNDED; DRY, OXIDIZED, SOME SAND

* * * *

TEST HOLE NUMBER: 5
LOCATION: 096N-52W-08CDDD
LEGAL LOCATION: SE SE SE SW SEC. 08, T. 096 N., R. 52 W.

1 - 4 GRAVEL, COARSE; ROCKS

* * * *

TEST HOLE NUMBER: 6
LOCATION: 096N-52W-10AC
LEGAL LOCATION: SW NE SEC. 10, T. 096 N., R. 52 W.

4 - 9 SAND, RED; SATURATED AT 9 FEET
9 - 14 SAND
14 - 29 GRAVEL, FINE, PEA-SIZE

* * * *

TEST HOLE NUMBER: 7
LOCATION: 096N-52W-14BBAB
LEGAL LOCATION: NW NE NW NW SEC. 14, T. 096 N., R. 52 W.

4 - 11 SAND, BROWN, MEDIUM, SILTY, CLAYEY,
MODERATELY SORTED; SATURATED, OXIDIZED,
BECOMES COARSER WITH DEPTH
11 - 21 GRAVEL, REDDISH-BROWN, MEDIUM, POORLY
SORTED; CLEAN, SATURATED, OXIDIZED,
WITH FINE SAND
21 - 41 SAND, GRAY, MEDIUM, MODERATELY SORTED;
CLEAN, SATURATED, UNOXIDIZED, FEW
PEBBLES

* * * *

TEST HOLE NUMBER: 8
LOCATION: 096N-52W-15BA
LEGAL LOCATION: NE NW SEC. 15, T. 096 N., R. 52 W.

14 - 24 SAND, FINE
24 - 29 GRAVEL, FINE

* * * *

TEST HOLE NUMBER: 9
LOCATION: 096N-52W-15BAAA
LEGAL LOCATION: NE NE NE NW SEC. 15, T. 096 N., R. 52 W.

7 - 34 SAND, BROWN, MEDIUM TO COARSE; 10 PER-
CENT CLAY

* * * *

TEST HOLE NUMBER: 10
LOCATION: 096N-52W-16CDCC
LEGAL LOCATION: SW SW SE SW SEC. 16, T. 096 N., R. 52 W.

6 - 9 SAND, RED-BROWN, MEDIUM, GRAVELLY; DRY,
OXIDIZED
9 - 11 GRAVEL, RED-BROWN, COARSE; SATURATED,
OXIDIZED

* * * *

TEST HOLE NUMBER: 11
LOCATION: 096N-52W-17BAAB
LEGAL LOCATION: NW NE NE NW SEC. 17, T. 096 N., R. 52 W.

14 - 30 SAND, BROWN, FINE TO MEDIUM; 15 PERCENT
CLAY

* * * *

TEST HOLE NUMBER: 12
LOCATION: 096N-52W-17DCCD
LEGAL LOCATION: SE SW SW SE SEC. 17, T. 096 N., R. 52 W.

7 - 19 SAND, BROWN, MEDIUM, VERY CLAYEY, POORLY
SORTED; SATURATED, HIT ROCK, ABANDONED
HOLE

* * * *

TEST HOLE NUMBER: 13
LOCATION: 096N-52W-17DDDA
LEGAL LOCATION: NE SE SE SE SEC. 17, T. 096 N., R. 52 W.

1 - 4 GRAVEL, TAN, COARSE, VERY CLAYEY, SANDY,
SILTY; MOIST, OXIDIZED

* * * *

TEST HOLE NUMBER: 14
LOCATION: 096N-52W-18AAAA
LEGAL LOCATION: NE NE NE NE SEC. 18, T. 096 N., R. 52 W.

24 - 45 SAND, BROWN, FINE TO MEDIUM; 35 PERCENT
CLAY

* * * *

TEST HOLE NUMBER: 15
LOCATION: 096N-52W-22AABB
LEGAL LOCATION: NW NW NE NE SEC. 22, T. 096 N., R. 52 W.

0 - 1 SAND, DARK-BROWN, MEDIUM, VERY CLAYEY;
OXIDIZED, DRY
9 - 31 SAND, GRAYISH-BROWN, COARSE, VERY CLAYEY,
VERY SILTY; SATURATED, OXIDIZED, WITH
STRINGERS OF GRAVEL

* * * *

TEST HOLE NUMBER: 16
LOCATION: 096N-52W-22BAAA
LEGAL LOCATION: NE NE NE NW SEC. 22, T. 096 N., R. 52 W.

2 - 35 GRAVEL, COARSE; SAMPLED AT 20 FEET

* * * *

TEST HOLE NUMBER: 17
LOCATION: 096N-52W-22BD
LEGAL LOCATION: SE NW SEC. 22, T. 096 N., R. 52 W.

14 - 24 SAND, FINE
24 - 44 SAND, COARSE

* * * *

TEST HOLE NUMBER: 18
LOCATION: 096N-52W-26CCDC
LEGAL LOCATION: SW SE SW SW SEC. 26, T. 096 N., R. 52 W.

4 - 5 SAND, BROWN, FINE, CLAYEY, POORLY SORTED;
MOIST, OXIDIZED, WITH PEBBLES

* * * *

TEST HOLE NUMBER: 19
LOCATION: 096N-52W-28ABAA
LEGAL LOCATION: NE NE NW NE SEC. 28, T. 096 N., R. 52 W.

10 - 17 SAND, DARK-BROWN, FINE, SILTY, VERY
CLAYEY, POORLY SORTED; SATURATED
17 - 39 GRAVEL, DARK-BROWN, FINE TO MEDIUM,
SANDY, CLAYEY, SUBROUNDED TO SUBANGULAR
FRAGMENTS; SATURATED

* * * *

TEST HOLE NUMBER: 20
LOCATION: 096N-52W-30ABBA
LEGAL LOCATION: NE NW NW NE SEC. 30, T. 096 N., R. 52 W.

7 - 9 SAND, BROWN, COARSE, CLAYEY; MOIST,
OXIDIZED

* * * *

TEST HOLE NUMBER: 21
LOCATION: 096N-52W-30DDCC
LEGAL LOCATION: SW SW SE SE SEC. 30, T. 096 N., R. 52 W.

5 - 7 GRAVEL, BROWN, MEDIUM, SANDY; OXIDIZED,
SATURATED

* * * *

TEST HOLE NUMBER: 22
LOCATION: 096N-52W-32DDDC
LEGAL LOCATION: SW SE SE SE SEC. 32, T. 096 N., R. 52 W.

1 - 5 SAND, RED-BROWN, FINE, CLAYEY; MOIST
5 - 10 SAND, RED-BROWN, MEDIUM, WELL-SORTED;
SATURATED, OXIDIZED
10 - 24 SAND, RED-BROWN, COARSE, WELL-SORTED;
SATURATED, OXIDIZED
24 - 30 SAND, GRAY-BROWN, COARSE, WELL-SORTED;
SATURATED, UNOXIDIZED

* * * *

TEST HOLE NUMBER: 23
LOCATION: 096N-52W-33DCDD
LEGAL LOCATION: SE SE SW SE SEC. 33, T. 096 N., R. 52 W.

0 - 30 SAND AND GRAVEL, MEDIUM SAND TO MEDIUM
PEBBLE GRAVEL; QUARTZ, CARBONATE AND
MUDROCK FRAGMENTS, AND A WIDE VARIETY
OF ROCK TYPES

* * * *

TEST HOLE NUMBER: 24
LOCATION: 096N-52W-33DD
LEGAL LOCATION: SE SE SEC. 33, T. 096 N., R. 52 W.

0 -	9	SAND, FINE
9 -	19	SAND, MEDIUM
19 -	24	GRAVEL, FINE
24 -	39	GRAVEL, PEA-SIZE

* * * *

TEST HOLE NUMBER: 25
LOCATION: 096N-52W-34CCCC
LEGAL LOCATION: SW SW SW SW SEC. 34, T. 096 N., R. 52 W.

2 -	5	SAND, BROWN, SILTY
5 -	45	SAND AND GRAVEL, MEDIUM TO COARSE

* * * *

TEST HOLE NUMBER: 26
LOCATION: 096N-52W-34CD
LEGAL LOCATION: SE SW SEC. 34, T. 096 N., R. 52 W.

0 -	4	SAND, OCHRE, MEDIUM
4 -	9	SAND, MEDIUM TO COARSE
9 -	14	SAND AND GRAVEL, COARSE SAND, FINE, NUT-SIZED GRAVEL
14 -	19	SAND, MEDIUM
19 -	24	SAND, MEDIUM TO COARSE
24 -	29	SAND AND GRAVEL, COARSE SAND, FINE, PEA-SIZED GRAVEL

* * * *

TEST HOLE NUMBER: 27
LOCATION: 096N-52W-34DD
LEGAL LOCATION: SE SE SEC. 34, T. 096 N., R. 52 W.

0 -	4	SAND, COARSE
4 -	9	GRAVEL, PEA-SIZED
9 -	14	GRAVEL, NUT-SIZED
14 -	46	GRAVEL, FINE, GRAIN-SIZED

* * * *

TEST HOLE NUMBER: 28
LOCATION: 096N-52W-35DDCC
LEGAL LOCATION: SW SW SE SE SEC. 35, T. 096 N., R. 52 W.

2 - 11 GRAVEL, BROWN, MEDIUM TO COARSE, SANDY,
VERY CLAYEY; VERY MOIST, OXIDIZED

* * * *

TEST HOLE NUMBER: 29
LOCATION: 096N-52W-36BBBB
LEGAL LOCATION: NW NW NW NW SEC. 36, T. 096 N., R. 52 W.

0 - 2 SAND, RED-BROWN, SILTY; DRY, OXIDIZED
6 - 21 SAND, RED-BROWN, GRAVELLY, VERY CLAYEY;
MOIST, OXIDIZED, SATURATED AT 10 FEET
21 - 30 SAND, GRAY-BROWN, GRAVELLY, VERY CLAYEY;
SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 30
LOCATION: 096N-53W-02BBBC
LEGAL LOCATION: SW NW NW NW SEC. 02, T. 096 N., R. 53 W.

16 - 32 SAND, YELLOW, FINE; 10 PERCENT CLAY

* * * *

TEST HOLE NUMBER: 31
LOCATION: 096N-53W-03DAAD
LEGAL LOCATION: SE NE NE SE SEC. 03, T. 096 N., R. 53 W.

4 - 24 SAND, BROWN, SILTY

* * * *

TEST HOLE NUMBER: 32
LOCATION: 096N-53W-11AAAD
LEGAL LOCATION: SE NE NE NE SEC. 11, T. 096 N., R. 53 W.

12 - 26 SAND, LIGHT-BROWN, FINE TO MEDIUM; 25
PERCENT CLAY

* * * *

TEST HOLE NUMBER: 33

LOCATION: 096N-53W-12DDDD

LEGAL LOCATION: SE SE SE SE SEC. 12, T. 096 N., R. 53 W.

7 - 21 SAND, BROWN; 45 PERCENT CLAY
21 - 31 SAND, GRAY; 45 PERCENT CLAY

* * * *

TEST HOLE NUMBER: 34

LOCATION: 096N-53W-15BBBB 1

LEGAL LOCATION: NW NW NW NW SEC. 15, T. 096 N., R. 53 W.

2 - 9 SAND, BROWN, FINE TO VERY FINE, VERY
CLAYEY, SILTY; SATURATED

* * * *

TEST HOLE NUMBER: 35

LOCATION: 096N-53W-16DDCC

LEGAL LOCATION: SW SW SE SE SEC. 16, T. 096 N., R. 53 W.

23 - 29 SAND, GRAY, FINE TO MEDIUM, CLAYEY

* * * *

TEST HOLE NUMBER: 36

LOCATION: 096N-53W-19BBAB

LEGAL LOCATION: NW NE NW NW SEC. 19, T. 096 N., R. 53 W.

0 - 5 GRAVEL, VERY SANDY, COBBLY; ABANDONED
HOLE

* * * *

TEST HOLE NUMBER: 37

LOCATION: 096N-53W-34DDDD

LEGAL LOCATION: SE SE SE SE SEC. 34, T. 096 N., R. 53 W.

17 - 38 SAND, FINE TO COARSE, MOSTLY FINE,
SLIGHTLY GRAVELLY; COARSE GRAVEL, TO
1 1/2 INCHES IN DIAMETER, IN THIN
STREAKS

* * * *

TEST HOLE NUMBER: 38

LOCATION: 097N-52W-01CCCC

LEGAL LOCATION: SW SW SW SW SEC. 01, T. 097 N., R. 52 W.

5 - 7 SAND, DIRTY-BROWN; WITH GRAVEL

* * * *

TEST HOLE NUMBER: 39

LOCATION: 097N-52W-03BB

LEGAL LOCATION: NW NW SEC. 03, T. 097 N., R. 52 W.

4 - 9 SAND, BROWN, VERY FINE; MOIST
9 - 49 SAND, FINE; SATURATED AT 10 FEET

* * * *

TEST HOLE NUMBER: 40

LOCATION: 097N-52W-05DAAD 1

LEGAL LOCATION: SE NE NE SE SEC. 05, T. 097 N., R. 52 W.

8 - 61 SAND AND GRAVEL, COARSE

* * * *

TEST HOLE NUMBER: 41

LOCATION: 097N-52W-05DAAD 2

LEGAL LOCATION: SE NE NE SE SEC. 05, T. 097 N., R. 52 W.

2 - 50 SAND AND GRAVEL, FINE TO COARSE

* * * *

TEST HOLE NUMBER: 42

LOCATION: 097N-52W-06AD

LEGAL LOCATION: SE NE SEC. 06, T. 097 N., R. 52 W.

3 - 14 SAND AND GRAVEL, COARSE SAND, MEDIUM
GRAVEL; SATURATED AT 7 FEET
14 - 34 GRAVEL, FINE TO MEDIUM; SOME COARSE
GRAVEL FROM 29 TO 34 FEET

* * * *

TEST HOLE NUMBER: 43

LOCATION: 097N-52W-08BAAA 1

LEGAL LOCATION: NE NE NE NW SEC. 08, T. 097 N., R. 52 W.

2 - 28 SAND, COARSE

* * * *

TEST HOLE NUMBER: 44
LOCATION: 097N-52W-09AA
LEGAL LOCATION: NE NE SEC. 09, T. 097 N., R. 52 W.

9 - 34 GRAVEL, FINE; SATURATED

* * * *

TEST HOLE NUMBER: 45
LOCATION: 097N-52W-10ABAA
LEGAL LOCATION: NE NE NW NE SEC. 10, T. 097 N., R. 52 W.

7 - 50 SAND AND GRAVEL, MEDIUM TO COARSE; BAD
CAVING CLOSE TO CONTACT

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TEST HOLE NUMBER: 46
LOCATION: 097N-52W-13BABB
LEGAL LOCATION: NW NW NE NW SEC. 13, T. 097 N., R. 52 W.

9 - 14 SAND, DARK-BROWN, MEDIUM, CLAYEY, POORLY
SORTED; SATURATED
14 - 18 GRAVEL, BROWN, FINE, CLAYEY, POORLY
SORTED, SUBANGULAR; SATURATED
18 - 36 GRAVEL, BROWN, MEDIUM, SANDY, MODERATELY
TO POORLY SORTED, SUBANGULAR;
SATURATED, SOME CLAY

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TEST HOLE NUMBER: 47
LOCATION: 097N-52W-13CBBB
LEGAL LOCATION: NW NW NW SW SEC. 13, T. 097 N., R. 52 W.

9 - 26 SAND, MEDIUM TO COARSE

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TEST HOLE NUMBER: 48
LOCATION: 097N-52W-13DADD
LEGAL LOCATION: SE SE NE SE SEC. 13, T. 097 N., R. 52 W.

1 - 63 GRAVEL; WITH MUCH COARSE AND VERY COARSE
SAND

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TEST HOLE NUMBER: 49
LOCATION: 097N-52W-13DDAA
LEGAL LOCATION: NE NE SE SE SEC. 13, T. 097 N., R. 52 W.

7 - 56 GRAVEL, MEDIUM; ALSO MEDIUM TO VERY
COARSE SAND

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TEST HOLE NUMBER: 50
LOCATION: 097N-52W-13DDDA
LEGAL LOCATION: NE SE SE SE SEC. 13, T. 097 N., R. 52 W.

7 - 48 GRAVEL, MEDIUM; ALSO MEDIUM TO VERY
COARSE SAND

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TEST HOLE NUMBER: 51
LOCATION: 097N-52W-14ABBA
LEGAL LOCATION: NE NW NW NE SEC. 14, T. 097 N., R. 52 W.

5 - 10 SAND, BROWN, FINE, CLAYEY, VERY SILTY,
MODERATELY SORTED; SATURATED,
OXIDIZED
12 - 22 SAND, BROWN, FINE, VERY CLAYEY, POORLY
SORTED; SATURATED, OXIDIZED, SAND
COARSENS AT 21 FEET
22 - 52 GRAVEL, GRAYISH, MEDIUM, CLAYEY, SILTY;
SATURATED, UNOXIDIZED, WITH COARSE SAND

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TEST HOLE NUMBER: 52
LOCATION: 097N-52W-24BBBB 1
LEGAL LOCATION: NW NW NW NW SEC. 24, T. 097 N., R. 52 W.

6 - 40 GRAVEL; WITH MEDIUM TO COARSE SAND

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TEST HOLE NUMBER: 53
LOCATION: 097N-52W-24BBBB 2

LEGAL LOCATION: NW NW NW NW SEC. 24, T. 097 N., R. 52 W.

16 - 40 SAND, VERY COARSE; ALSO GRAVEL INCREASING
WITH DEPTH

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TEST HOLE NUMBER: 54
LOCATION: 097N-52W-25AAAA
LEGAL LOCATION: NE NE NE NE SEC. 25, T. 097 N., R. 52 W.

12 - 69 SAND, BROWN, MEDIUM TO COARSE; 15 PERCENT
CLAY

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TEST HOLE NUMBER: 55
LOCATION: 097N-52W-25AB
LEGAL LOCATION: NW NE SEC. 25, T. 097 N., R. 52 W.

3 - 4 SAND
4 - 7 SAND, COARSE
7 - 9 GRAVEL, FINE; MOIST
9 - 34 GRAVEL, FINE; SATURATED

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TEST HOLE NUMBER: 56
LOCATION: 097N-52W-25BAAA
LEGAL LOCATION: NE NE NE NW SEC. 25, T. 097 N., R. 52 W.

13 - 39 GRAVEL, BROWN, MEDIUM; MIXED WITH 25 PER-
CENT SAND AND CLAY

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TEST HOLE NUMBER: 57
LOCATION: 097N-52W-31DDCC
LEGAL LOCATION: SW SW SE SE SEC. 31, T. 097 N., R. 52 W.

0 - 5 GRAVEL, RED-BROWN, COARSE, SANDY; MOIST,
OXIDIZED

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TEST HOLE NUMBER: 58
LOCATION: 097N-52W-36CD

LEGAL LOCATION: SE SW SEC. 36, T. 097 N., R. 52 W.

12 - 19 SAND; SATURATED
19 - 36 GRAVEL, PEA-SIZE

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TEST HOLE NUMBER: 59
LOCATION: 097N-52W-36DDCC
LEGAL LOCATION: SW SW SE SE SEC. 36, T. 097 N., R. 52 W.

20 - 26 SAND, GRAY, MEDIUM TO COARSE, VERY
CLAYEY, POORLY SORTED, SUBANGULAR;
SATURATED

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TEST HOLE NUMBER: 60
LOCATION: 097N-53W-01AABB
LEGAL LOCATION: NW NW NE NE SEC. 01, T. 097 N., R. 53 W.

4 - 27 GRAVEL, BROWN, MEDIUM, CLAYEY, POORLY
SORTED; SATURATED, WITH COARSE SAND,
FINE GRAVEL AT 13 FEET, UNOXIDIZED AT
18 FEET

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TEST HOLE NUMBER: 61
LOCATION: 097N-53W-06BBAA
LEGAL LOCATION: NE NE NW NW SEC. 06, T. 097 N., R. 53 W.

13 - 18 SAND, LIGHT-GRAY, POOR TO WELL-GRADED;
SATURATED, CLEAN
18 - 31 SAND, POORLY GRADED; WITH CLAY AND SAND
STREAKS, ABOUT 10 PERCENT CLAY DEPOSITS

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TEST HOLE NUMBER: 62
LOCATION: 097N-53W-06BBCB
LEGAL LOCATION: NW SW NW NW SEC. 06, T. 097 N., R. 53 W.

10 - 15 SAND, GRAY AND REDDISH-BROWN, VERY FINE,
SILTY
15 - 20 SAND, BLUE-GRAY, VERY FINE, SILTY

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TEST HOLE NUMBER: 63
LOCATION: 097N-53W-09DDBC
LEGAL LOCATION: SW NW SE SE SEC. 09, T. 097 N., R. 53 W.

12 - 19 SAND, MEDIUM-BROWN, FINE, POORLY SORTED,
CLAYEY; SATURATED, PARTIALLY OXIDIZED

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TEST HOLE NUMBER: 64
LOCATION: 097N-53W-15ABAB
LEGAL LOCATION: NW NE NW NE SEC. 15, T. 097 N., R. 53 W.

14 - 15 SAND, LIGHT-GRAY-BROWN, FINE, VERY
CLAYEY; SATURATED, OXIDIZED
15 - 22 GRAVEL, LIGHT-GRAY-BROWN, FINE, CLAYEY;
SATURATED, OXIDIZED, SOME FINE SAND
22 - 36 SAND, GRAYISH, FINE, SILTY, POORLY
SORTED; SATURATED, OXIDIZED

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TEST HOLE NUMBER: 65
LOCATION: 097N-53W-17DDDD
LEGAL LOCATION: SE SE SE SE SEC. 17, T. 097 N., R. 53 W.

6 - 12 GRAVEL, BROWN, COARSE
12 - 76 SAND, GRAY, FINE, SILTY; WITH ORGANIC
MATTER

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TEST HOLE NUMBER: 66
LOCATION: 097N-53W-23BBBB
LEGAL LOCATION: NW NW NW NW SEC. 23, T. 097 N., R. 53 W.

4 - 9 SAND, BROWN, CLAYEY; SATURATED
9 - 14 GRAVEL, CLAYEY
19 - 24 GRAVEL, CLAYEY

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TEST HOLE NUMBER: 67
LOCATION: 097N-53W-31ADAA
LEGAL LOCATION: NE NE SE NE SEC. 31, T. 097 N., R. 53 W.

8 - 12 SAND AND SILT, REDDISH-BROWN, MEDIUM TO

COARSE SAND, SLIGHTLY CLAYEY; OXIDIZED

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TEST HOLE NUMBER: 68
LOCATION: 097N-54W-16BDBD
LEGAL LOCATION: SE NW SE NW SEC. 16, T. 097 N., R. 54 W.

3 - 7 SAND, LIGHT-BROWN

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TEST HOLE NUMBER: 69
LOCATION: 097N-54W-24CCBC
LEGAL LOCATION: SW NW SW SW SEC. 24, T. 097 N., R. 54 W.

4 - 6 SAND, BROWN, MEDIUM TO COARSE, PEBBLY,
CLAYEY; SATURATED

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TEST HOLE NUMBER: 70
LOCATION: 097N-54W-27ADDD
LEGAL LOCATION: SE SE SE NE SEC. 27, T. 097 N., R. 54 W.

15 - 28 SAND, LIGHT-BROWN, MEDIUM, SILTY; SOME
CLAY LENSES, SATURATED

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TEST HOLE NUMBER: 71
LOCATION: 097N-55W-01BCBB
LEGAL LOCATION: NW NW SW NW SEC. 01, T. 097 N., R. 55 W.

11 - 13 SAND, LIGHT-GRAY, FINE TO MEDIUM; DRY
14 - 34 SAND, GRAY TO DARK-GRAY LAMINATED; FINE,
DRY, BROWN AND SLIGHTLY MOIST AT 18
FEET, ABANDONED HOLE DUE TO CAVING

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TEST HOLE NUMBER: 72
LOCATION: 097N-55W-02AAAD
LEGAL LOCATION: SE NE NE NE SEC. 02, T. 097 N., R. 55 W.

2 - 6 SAND, BROWN, FINE TO MEDIUM; SATURATED AT
4 FEET

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TEST HOLE NUMBER: 73
LOCATION: 097N-55W-19BBBB
LEGAL LOCATION: NW NW NW NW SEC. 19, T. 097 N., R. 55 W.

0 - 10 SAND AND GRAVEL, MEDIUM SAND TO FINE
PEBBLE GRAVEL; MOSTLY QUARTZ, MUDROCKS,
AND CARBONATES

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TEST HOLE NUMBER: 74
LOCATION: 097N-55W-24AAAA
LEGAL LOCATION: NE NE NE NE SEC. 24, T. 097 N., R. 55 W.

0 - 4 SAND AND GRAVEL, MEDIUM SAND TO FINE
PEBBLE GRAVEL; TOPSOIL FROM 0 TO 1 FOOT

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TEST HOLE NUMBER: 75
LOCATION: 098N-52W-05CCCD
LEGAL LOCATION: SE SW SW SW SEC. 05, T. 098 N., R. 52 W.

1 - 6 SAND, BROWN, FINE; MOIST, OXIDIZED, SOME
CLAY
12 - 19 SAND, BROWN, FINE TO MEDIUM, VERY CLAYEY;
SATURATED

* * * *

TEST HOLE NUMBER: 76
LOCATION: 098N-52W-05CDDD
LEGAL LOCATION: SE SE SE SW SEC. 05, T. 098 N., R. 52 W.

7 - 16 SAND, BROWN, FINE TO MEDIUM, SILTY
16 - 21 SAND, BROWN, FINE TO COARSE, SILTY,
STRATIFIED; CLEAN

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TEST HOLE NUMBER: 77
LOCATION: 098N-52W-05DCAC
LEGAL LOCATION: SW NE SW SE SEC. 05, T. 098 N., R. 52 W.

8 - 15 SAND, DARK-BROWN, FINE, SLIGHTLY CLAYEY,
POORLY GRADED
15 - 20 SAND, POORLY GRADED
23 - 25 SAND, FINE; WITH A LITTLE SILT

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TEST HOLE NUMBER: 78
LOCATION: 098N-52W-07AACD
LEGAL LOCATION: SE SW NE NE SEC. 07, T. 098 N., R. 52 W.

3 - 8 SAND, GRAY ALTERNATING WITH BLACK FROM
3 TO 4 FEET, CLAYEY
8 - 12 SAND, RUSTY, SLIGHTLY CLAYEY, SUBANGULAR,
WELL-GRADED; SATURATED
12 - 15 SAND AND CLAY

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TEST HOLE NUMBER: 79
LOCATION: 098N-52W-07BBCB
LEGAL LOCATION: NW SW NW NW SEC. 07, T. 098 N., R. 52 W.

0 - 4 GRAVEL, BROWN, COARSE; MOIST, SOME COARSE
SAND
4 - 9 SAND AND GRAVEL, BROWN, COARSE SAND, FINE
GRAVEL; SATURATED
9 - 45 GRAVEL, RED-BROWN, MEDIUM TO COARSE;
OXIDIZED, SOME COARSE SAND

* * * *

TEST HOLE NUMBER: 80
LOCATION: 098N-52W-07DDDD
LEGAL LOCATION: SE SE SE SE SEC. 07, T. 098 N., R. 52 W.

0 - 17 SAND AND GRAVEL, MEDIUM TO COARSE

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TEST HOLE NUMBER: 81
LOCATION: 098N-52W-08AB
LEGAL LOCATION: NW NE SEC. 08, T. 098 N., R. 52 W.

3 - 9 SAND, FINE
9 - 14 SAND, FINE TO MEDIUM; SOME CLAY CONTENT
AT 13 FEET (ALLUVIUM?)
14 - 21 SAND, MEDIUM; SOME CLAY

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TEST HOLE NUMBER: 82
LOCATION: 098N-52W-08CB
LEGAL LOCATION: NW SW SEC. 08, T. 098 N., R. 52 W.

13 - 17 GRAVEL, COARSE
17 - 26 GRAVEL; WITH RED CLAY

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TEST HOLE NUMBER: 83
LOCATION: 098N-52W-08CBCB
LEGAL LOCATION: NW SW NW SW SEC. 08, T. 098 N., R. 52 W.

8 - 13 SAND, FINE
13 - 17 GRAVEL, COARSE
17 - 26 GRAVEL AND CLAY, RED CLAY

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TEST HOLE NUMBER: 84
LOCATION: 098N-52W-08CCCC
LEGAL LOCATION: SW SW SW SW SEC. 08, T. 098 N., R. 52 W.

2 - 7 SAND
7 - 12 SAND AND GRAVEL
12 - 17 GRAVEL
17 - 31 GRAVEL AND CLAY, RED CLAY

* * * *

TEST HOLE NUMBER: 85
LOCATION: 098N-52W-08CDDD
LEGAL LOCATION: SE SE SE SW SEC. 08, T. 098 N., R. 52 W.

14 - 43 SAND AND GRAVEL

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TEST HOLE NUMBER: 86
LOCATION: 098N-52W-17CCCC 1
LEGAL LOCATION: SW SW SW SW SEC. 17, T. 098 N., R. 52 W.

0 - 26 GRAVEL, MEDIUM TO COARSE

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TEST HOLE NUMBER: 87
LOCATION: 098N-52W-17CCCC 2
LEGAL LOCATION: SW SW SW SW SEC. 17, T. 098 N., R. 52 W.

0 - 26 GRAVEL, MEDIUM TO COARSE; WITH COAL AT 25
FEET

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TEST HOLE NUMBER: 88
LOCATION: 098N-52W-18AAAA 2
LEGAL LOCATION: NE NE NE NE SEC. 18, T. 098 N., R. 52 W.

2 - 16 GRAVEL, YELLOW-BROWN, FINE TO MEDIUM
PEBBLE; MOSTLY CARBONATE AND BLACK
CRYSTALLINE ROCK FRAGMENTS

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TEST HOLE NUMBER: 89
LOCATION: 098N-52W-18CAAA 1
LEGAL LOCATION: NE NE NE SW SEC. 18, T. 098 N., R. 52 W.

2 - 33 SAND AND GRAVEL, COARSE SAND TO MEDIUM
PEBBLE GRAVEL; CONTAINS ASSORTED
CARBONATE AND BLACK CRYSTALLINE ROCK
FRAGMENTS

* * * *

TEST HOLE NUMBER: 90
LOCATION: 098N-52W-18CCCC
LEGAL LOCATION: SW SW SW SW SEC. 18, T. 098 N., R. 52 W.

1 - 38 SAND AND GRAVEL, MEDIUM SAND TO FINE
PEBBLE GRAVEL; MOSTLY CARBONATE AND
BLACK CRYSTALLINE ROCK FRAGMENTS, SOME
QUARZ, SILTY FROM 1 TO 4 FEET

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TEST HOLE NUMBER: 91
LOCATION: 098N-52W-18CCCC 1
LEGAL LOCATION: SW SW SW SW SEC. 18, T. 098 N., R. 52 W.

0 - 8 SAND, REDDISH-BROWN, MEDIUM, VERY POORLY
SORTED; MOIST, SOME COARSE GRAVEL

- 8 - 23 GRAVEL, REDDISH-BROWN, MEDIUM TO COARSE,
POORLY SORTED; SOME MEDIUM TO COARSE
SAND, SATURATED AT 10 FEET
- 23 - 41 GRAVEL, REDDISH-BROWN, MEDIUM; SATURATED,
SOME COARSE SAND AT 35 FEET

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TEST HOLE NUMBER: 92
 LOCATION: 098N-52W-18DAAA
 LEGAL LOCATION: NE NE NE SE SEC. 18, T. 098 N., R. 52 W.

- 2 - 19 SAND AND GRAVEL, YELLOW-BROWN, COARSE
SAND TO MEDIUM PEBBLE GRAVEL;
MOSTLY CARBONATE ROCK FRAGMENTS AND
SOME QUARTZ

* * * *

TEST HOLE NUMBER: 93
 LOCATION: 098N-52W-18DCCC
 LEGAL LOCATION: SW SW SW SE SEC. 18, T. 098 N., R. 52 W.

- 0 - 2 SAND, YELLOW-BROWN, SILTY, PEBBLY
- 2 - 29 SAND AND GRAVEL, YELLOW-BROWN, MEDIUM
SAND TO MEDIUM PEBBLE GRAVEL; MOSTLY
CARBONATE AND BLACK CRYSTALLINE ROCK
FRAGMENTS

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TEST HOLE NUMBER: 94
 LOCATION: 098N-52W-19BBBB
 LEGAL LOCATION: NW NW NW NW SEC. 19, T. 098 N., R. 52 W.

- 0 - 39 SAND AND GRAVEL, MEDIUM SAND TO COARSE
PEBBLE GRAVEL; WIDE VARIETY OF ROCK
TYPES INCLUDING COAL; SOME CLAY LAYERS

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TEST HOLE NUMBER: 95
 LOCATION: 098N-52W-20ABBB
 LEGAL LOCATION: NW NW NW NE SEC. 20, T. 098 N., R. 52 W.

- 3 - 17 SAND AND GRAVEL, MEDIUM SAND TO FINE
PEBBLE GRAVEL, SILTY; MOSTLY CARBONATE
AND BLACK CRYSTALLINE ROCK FRAGMENTS

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TEST HOLE NUMBER: 96
LOCATION: 098N-52W-20ADDD
LEGAL LOCATION: SE SE SE NE SEC. 20, T. 098 N., R. 52 W.

18 - 35 GRAVEL, VERY FINE TO MEDIUM PEBBLE,
SILTY; MOSTLY CARBONATE AND BLACK
CRYSTALLINE ROCK FRAGMENTS WITH SOME
QUARTZ

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TEST HOLE NUMBER: 97
LOCATION: 098N-52W-20DDDD
LEGAL LOCATION: SE SE SE SE SEC. 20, T. 098 N., R. 52 W.

1 - 5 SAND, GRAY, MEDIUM, VERY CLAYEY;
SATURATED
5 - 14 SAND, BROWN, VERY COARSE, SILTY, POORLY
SORTED, SUBANGULAR; SATURATED
14 - 22 SAND, BROWN, MEDIUM, SILTY, POORLY
SORTED, SUBANGULAR; SATURATED
22 - 28 GRAVEL, GRAY, FINE, VERY CLAYEY, SANDY,
POORLY SORTED; SATURATED

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TEST HOLE NUMBER: 98
LOCATION: 098N-52W-21BBBB
LEGAL LOCATION: NW NW NW NW SEC. 21, T. 098 N., R. 52 W.

3 - 8 SAND, MEDIUM, WELL-SORTED; MOIST
8 - 13 SAND, COARSE, CLAYEY, POORLY SORTED;
OXIDIZED, A FEW LENSES OF PARTIALLY
OXIDIZED, GRAY-BROWN CLAY, SATURATED AT
10 FEET
13 - 30 SAND, GRAYISH, COARSE, VERY CLAYEY;
UNOXIDIZED

* * * *

TEST HOLE NUMBER: 99
LOCATION: 098N-52W-27BBBB
LEGAL LOCATION: NW NW NW NW SEC. 27, T. 098 N., R. 52 W.

0 - 1 GRAVEL, BROWN, CLAYEY; MOIST (ROADFILL)

14 - 19 SAND, LIGHT-BROWN, MEDIUM, VERY CLAYEY,
POORLY SORTED; SATURATED, OXIDIZED

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TEST HOLE NUMBER: 100
LOCATION: 098N-52W-28AC
LEGAL LOCATION: SW NE SEC. 28, T. 098 N., R. 52 W.

0 - 4 SAND, BROWN
16 - 24 GRAVEL; SATURATED AT 20 FEET
24 - 39 SAND, COARSE; SATURATED

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TEST HOLE NUMBER: 101
LOCATION: 098N-52W-28CABB
LEGAL LOCATION: NW NW NE SW SEC. 28, T. 098 N., R. 52 W.

12 - 19 SAND AND GRAVEL, VERY COARSE SAND TO FINE
PEBBLE GRAVEL; MOSTLY CARBONATE AND
BLACK CRYSTALLINE ROCK FRAGMENTS AND
QUARTZ

* * * *

TEST HOLE NUMBER: 102
LOCATION: 098N-52W-28CB
LEGAL LOCATION: NW SW SEC. 28, T. 098 N., R. 52 W.

7 - 9 GRAVEL, MEDIUM
9 - 14 GRAVEL, FINE TO MEDIUM; SATURATED AT 12
FEET
14 - 19 SAND, COARSE
19 - 24 SAND, MEDIUM
24 - 29 SAND, MEDIUM TO COARSE

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TEST HOLE NUMBER: 103
LOCATION: 098N-52W-29AAAA
LEGAL LOCATION: NE NE NE NE SEC. 29, T. 098 N., R. 52 W.

2 - 26 GRAVEL, FINE TO MEDIUM PEBBLE, SILTY,
SANDY; MOSTLY CARBONATE AND BLACK
CRYSTALLINE ROCK FRAGMENTS, OXIDIZED

* * * *

TEST HOLE NUMBER: 104
LOCATION: 098N-52W-29DA
LEGAL LOCATION: NE SE SEC. 29, T. 098 N., R. 52 W.

8 - 9 GRAVEL, FINE; SATURATED AT 9 FEET
9 - 19 GRAVEL

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TEST HOLE NUMBER: 105
LOCATION: 098N-52W-29DD
LEGAL LOCATION: SE SE SEC. 29, T. 098 N., R. 52 W.

3 - 24 GRAVEL, MEDIUM; SATURATED AT 4 FEET

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TEST HOLE NUMBER: 106
LOCATION: 098N-52W-30AAAA
LEGAL LOCATION: NE NE NE NE SEC. 30, T. 098 N., R. 52 W.

1 - 22 GRAVEL, BROWN, FINE, CLAYEY; SATURATED,
OXIDIZED, SOME COARSE SAND, COARSE
GRAVEL AT 5 FEET

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TEST HOLE NUMBER: 107
LOCATION: 098N-52W-32BBBB 1
LEGAL LOCATION: NW NW NW NW SEC. 32, T. 098 N., R. 52 W.

1 - 30 GRAVEL, MEDIUM TO COARSE; SOME TRACES OF
COAL

* * * *

TEST HOLE NUMBER: 108
LOCATION: 098N-52W-32BBBB 2
LEGAL LOCATION: NW NW NW NW SEC. 32, T. 098 N., R. 52 W.

0 - 29 GRAVEL, MEDIUM TO COARSE

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TEST HOLE NUMBER: 109
LOCATION: 098N-52W-32BBBB 3
LEGAL LOCATION: NW NW NW NW SEC. 32, T. 098 N., R. 52 W.

0 - 28 GRAVEL, MEDIUM TO COARSE

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TEST HOLE NUMBER: 110

LOCATION: 098N-52W-33CCCC

LEGAL LOCATION: SW SW SW SW SEC. 33, T. 098 N., R. 52 W.

9 - 14 SAND AND GRAVEL, RED-BROWN, COARSE SAND,
MEDIUM GRAVEL; SATURATED
14 - 35 SAND AND GRAVEL, RED-BROWN, COARSE SAND,
FINE GRAVEL; SATURATED

* * * *

TEST HOLE NUMBER: 111

LOCATION: 098N-52W-34CCCC

LEGAL LOCATION: SW SW SW SW SEC. 34, T. 098 N., R. 52 W.

5 - 14 SAND AND GRAVEL, YELLOWISH-BROWN, FINE
SAND TO MEDIUM PEBBLE GRAVEL; WIDE
VARIETY OF ROCK TYPES

* * * *

TEST HOLE NUMBER: 112

LOCATION: 098N-53W-01BBBB

LEGAL LOCATION: NW NW NW NW SEC. 01, T. 098 N., R. 53 W.

1 - 6 SAND, OLIVE-BROWN, COARSE, SILTY, POORLY
SORTED; SATURATED, OXIDIZED
6 - 34 GRAVEL, BROWN, FINE TO MEDIUM, CLAYEY;
SATURATED, OXIDIZED TO 31 FEET, WITH
FINE SAND

* * * *

TEST HOLE NUMBER: 113

LOCATION: 098N-53W-01CCCC

LEGAL LOCATION: SW SW SW SW SEC. 01, T. 098 N., R. 53 W.

1 - 6 SAND, BROWN, FINE, SILTY; MOIST, OXIDIZED
6 - 35 GRAVEL, BROWN, MEDIUM, CLAYEY, SANDY,
SUBANGULAR, POORLY SORTED; SATURATED

* * * *

TEST HOLE NUMBER: 114
LOCATION: 098N-53W-02BAAA 1
LEGAL LOCATION: NE NE NE NW SEC. 02, T. 098 N., R. 53 W.

2 - 30 GRAVEL, VERY FINE TO MEDIUM PEBBLE,
SANDY; MOSTLY SUBROUNDED CARBONATE AND
BLACK MUDROCK FRAGMENTS, OXIDIZED FROM
2 TO 20 FEET

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TEST HOLE NUMBER: 115
LOCATION: 098N-53W-02BAAA 2
LEGAL LOCATION: NE NE NE NW SEC. 02, T. 098 N., R. 53 W.

2 - 22 GRAVEL, VERY FINE TO MEDIUM PEBBLE,
SANDY; MOSTLY SUBROUNDED CARBONATE AND
BLACK MUDROCK FRAGMENTS, OXIDIZED FROM
2 TO 20 FEET

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TEST HOLE NUMBER: 116
LOCATION: 098N-53W-02BBBA
LEGAL LOCATION: NE NW NW NW SEC. 02, T. 098 N., R. 53 W.

0 - 4 GRAVEL, BROWN, COARSE, CLAYEY, POORLY
SORTED; MOIST, OXIDIZED, WITH COARSE
SAND
4 - 14 SAND, BROWN, VERY COARSE, CLAYEY;
SATURATED, OXIDIZED
14 - 51 GRAVEL, BROWN, COARSE, CLAYEY; SATURATED,
OXIDIZED, WITH COARSE SAND

* * * *

TEST HOLE NUMBER: 117
LOCATION: 098N-53W-02BCCC
LEGAL LOCATION: SW SW SW NW SEC. 02, T. 098 N., R. 53 W.

5 - 40 GRAVEL, FINE PEBBLE, SANDY; MOSTLY
CARBONATE AND BLACK CRYSTALLINE ROCK
FRAGMENTS, SOME QUARTZ

* * * *

TEST HOLE NUMBER: 118
LOCATION: 098N-53W-02CC

LEGAL LOCATION: SW SW SEC. 02, T. 098 N., R. 53 W.

1 -	4	GRAVEL
4 -	9	GRAVEL, MEDIUM TO COARSE
9 -	14	GRAVEL, MEDIUM
14 -	19	GRAVEL
19 -	24	GRAVEL, FINE TO MEDIUM

* * * *

TEST HOLE NUMBER: 119
LOCATION: 098N-53W-05CCDD 1
LEGAL LOCATION: SE SE SW SW SEC. 05, T. 098 N., R. 53 W.

9 -	18	SAND, VERY COARSE; WITH SOME HALF-INCH GRAVEL
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TEST HOLE NUMBER: 120
LOCATION: 098N-53W-05CCDD 2
LEGAL LOCATION: SE SE SW SW SEC. 05, T. 098 N., R. 53 W.

8 -	16	SAND, BROWN, COARSE TO VERY COARSE; SOME HALF-INCH GRAVEL
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TEST HOLE NUMBER: 121
LOCATION: 098N-53W-08AA 1
LEGAL LOCATION: NE NE SEC. 08, T. 098 N., R. 53 W.

6 -	48	SAND; SATURATED AT 6 FEET
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TEST HOLE NUMBER: 122
LOCATION: 098N-53W-08AA 2
LEGAL LOCATION: NE NE SEC. 08, T. 098 N., R. 53 W.

5 -	7	SAND; SATURATED AT 5 FEET
7 -	9	GRAVEL, COARSE
9 -	18	SAND AND CLAY, FINE SAND, YELLOW CLAY

* * * *

TEST HOLE NUMBER: 123

LOCATION: 098N-53W-08AC 1
LEGAL LOCATION: SW NE SEC. 08, T. 098 N., R. 53 W.

6 - 12 GRAVEL
12 - 25 SAND

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TEST HOLE NUMBER: 124
LOCATION: 098N-53W-08AC 2
LEGAL LOCATION: SW NE SEC. 08, T. 098 N., R. 53 W.

8 - 12 GRAVEL
12 - 30 SAND; SATURATED AT 18 FEET

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TEST HOLE NUMBER: 125
LOCATION: 098N-53W-10BBBB
LEGAL LOCATION: NW NW NW NW SEC. 10, T. 098 N., R. 53 W.

0 - 28 SAND AND GRAVEL, MEDIUM TO COARSE

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TEST HOLE NUMBER: 126
LOCATION: 098N-53W-10CD
LEGAL LOCATION: SE SW SEC. 10, T. 098 N., R. 53 W.

4 - 9 SAND, FINE; SATURATED AT 6 FEET
9 - 30 SAND, MEDIUM; SATURATED

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TEST HOLE NUMBER: 127
LOCATION: 098N-53W-11CB
LEGAL LOCATION: NW SW SEC. 11, T. 098 N., R. 53 W.

3 - 16 SAND; AND SOME GRAVEL, SATURATED AT 16
FEET
16 - 33 SAND

* * * *

TEST HOLE NUMBER: 128
LOCATION: 098N-53W-11DC
LEGAL LOCATION: SW SE SEC. 11, T. 098 N., R. 53 W.

1 - 4 SAND, BROWN, MEDIUM
4 - 9 SAND, LIGHT-BROWN, FINE
9 - 14 SAND, GRAY; COMPACT, SATURATED
14 - 19 SAND, COARSE; SATURATED
19 - 24 GRAVEL, FINE; SATURATED

* * * *

TEST HOLE NUMBER: 129
LOCATION: 098N-53W-12CCCC
LEGAL LOCATION: SW SW SW SW SEC. 12, T. 098 N., R. 53 W.

0 - 43 GRAVEL, MEDIUM TO COARSE

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TEST HOLE NUMBER: 130
LOCATION: 098N-53W-12CDDA
LEGAL LOCATION: NE SE SE SW SEC. 12, T. 098 N., R. 53 W.

0 - 7 SAND, WELL-GRADED, SUBANGULAR; DRY
7 - 16 SAND AND CLAY; HIGH CALCIUM CARBONATE
CONTENT
16 - 21 SAND, WELL-GRADED; UNOXIDIZED BELOW 20
FEET, CLEAN

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TEST HOLE NUMBER: 131
LOCATION: 098N-53W-12DADA
LEGAL LOCATION: NE SE NE SE SEC. 12, T. 098 N., R. 53 W.

2 - 21 GRAVEL, FINE TO MEDIUM; DRY

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TEST HOLE NUMBER: 132
LOCATION: 098N-53W-13AABA
LEGAL LOCATION: NE NW NE NE SEC. 13, T. 098 N., R. 53 W.

0 - 8 SAND AND GRAVEL, RED-BROWN, COARSE SAND,
MEDIUM GRAVEL
8 - 13 SAND, RED-BROWN, COARSE; OXIDIZED, WITH
SOME GRAVEL
13 - 48 SAND AND GRAVEL, COARSE SAND, MEDIUM
GRAVEL; SATURATED, CLEAN

* * * *

TEST HOLE NUMBER: 133
LOCATION: 098N-53W-13DAAA
LEGAL LOCATION: NE NE NE SE SEC. 13, T. 098 N., R. 53 W.

2 - 38 SAND AND GRAVEL, FINE SAND TO COARSE
PEBBLE GRAVEL; MOSTLY SUBROUNDED
CARBONATE AND CRYSTALLINE ROCK
FRAGMENTS

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TEST HOLE NUMBER: 134
LOCATION: 098N-53W-13DBAA
LEGAL LOCATION: NE NE NW SE SEC. 13, T. 098 N., R. 53 W.

3 - 25 SAND AND GRAVEL, YELLOW-BROWN, COARSE
SAND TO FINE PEBBLE GRAVEL; MOSTLY
SUBROUNDED CARBONATE AND CRYSTALLINE
ROCK FRAGMENTS AND QUARTZ
25 - 48 SAND AND GRAVEL, GRAY, COARSE SAND TO
MEDIUM PEBBLE GRAVEL; MOSTLY CARBONATE,
MUDROCK AND ASSORTED CRYSTALLINE ROCK
FRAGMENTS AND QUARTZ

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TEST HOLE NUMBER: 135
LOCATION: 098N-53W-14ABDC
LEGAL LOCATION: SW SE NW NE SEC. 14, T. 098 N., R. 53 W.

1 - 21 SAND, BROWN, FINE TO COARSE, SLIGHTLY
SILTY, STRATIFIED; DRY

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TEST HOLE NUMBER: 136
LOCATION: 098N-53W-14BA
LEGAL LOCATION: NE NW SEC. 14, T. 098 N., R. 53 W.

1 - 5 SAND, FINE
5 - 53 SAND AND GRAVEL; SATURATED AT 18 FEET

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TEST HOLE NUMBER: 137

LOCATION: 098N-53W-14BBBB
LEGAL LOCATION: NW NW NW NW SEC. 14, T. 098 N., R. 53 W.

0 - 15 GRAVEL, FINE TO MEDIUM

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TEST HOLE NUMBER: 138
LOCATION: 098N-53W-14BD
LEGAL LOCATION: SE NW SEC. 14, T. 098 N., R. 53 W.

2 - 9 SAND AND GRAVEL, FINE SAND
9 - 33 SAND AND GRAVEL; SATURATED AT 18 FEET

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TEST HOLE NUMBER: 139
LOCATION: 098N-53W-14CB
LEGAL LOCATION: NW SW SEC. 14, T. 098 N., R. 53 W.

0 - 5 SAND, BROWN, COARSE
5 - 20 GRAVEL, FINE; SATURATED

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TEST HOLE NUMBER: 140
LOCATION: 098N-53W-14CC
LEGAL LOCATION: SW SW SEC. 14, T. 098 N., R. 53 W.

0 - 4 SAND AND GRAVEL, COARSE SAND, FINE GRAVEL
(ROADFILL)
4 - 9 SAND, BROWN, COARSE; SATURATED AT 8 FEET
9 - 19 SAND; SATURATED
19 - 24 GRAVEL, FINE; SATURATED

* * * *

TEST HOLE NUMBER: 141
LOCATION: 098N-53W-14DC
LEGAL LOCATION: SW SE SEC. 14, T. 098 N., R. 53 W.

0 - 4 SAND, LIGHT-BROWN, FINE
4 - 9 GRAVEL, FINE; WITH SOME LARGER PEBBLES
9 - 14 GRAVEL, MEDIUM; SATURATED, SOME LARGER
PEBBLES
14 - 29 GRAVEL, FINE TO MEDIUM; SATURATED

* * * *

TEST HOLE NUMBER: 142
LOCATION: 098N-53W-14DDDA
LEGAL LOCATION: NE SE SE SE SEC. 14, T. 098 N., R. 53 W.

3 - 14 SAND, BROWN, COARSE, CLAYEY; SATURATED
14 - 58 GRAVEL, GRAY-BROWN, FINE TO MEDIUM; SOME
COARSE SAND, SATURATED

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TEST HOLE NUMBER: 143
LOCATION: 098N-53W-15CC
LEGAL LOCATION: SW SW SEC. 15, T. 098 N., R. 53 W.

3 - 7 SAND AND GRAVEL
7 - 27 SAND, FINE; SATURATED AT 12 FEET

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TEST HOLE NUMBER: 144
LOCATION: 098N-53W-15CCCC
LEGAL LOCATION: SW SW SW SW SEC. 15, T. 098 N., R. 53 W.

9 - 37 SAND, MEDIUM TO VERY COARSE; SOME
GRANULES, GRAVEL

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TEST HOLE NUMBER: 145
LOCATION: 098N-53W-16AA
LEGAL LOCATION: NE NE SEC. 16, T. 098 N., R. 53 W.

4 - 20 SAND, COARSE; SATURATED AT 8 FEET,
GRAVELLY IN BOTTOM 3 FEET

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TEST HOLE NUMBER: 146
LOCATION: 098N-53W-16DA
LEGAL LOCATION: NE SE SEC. 16, T. 098 N., R. 53 W.

5 - 42 GRAVEL; SATURATED AT 5 FEET

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TEST HOLE NUMBER: 147
LOCATION: 098N-53W-16DB

LEGAL LOCATION: NW SE SEC. 16, T. 098 N., R. 53 W.

8 - 25 GRAVEL

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TEST HOLE NUMBER: 148
LOCATION: 098N-53W-22AAAC
LEGAL LOCATION: SW NE NE NE SEC. 22, T. 098 N., R. 53 W.

4 - 14 SAND, REDDISH, POORLY GRADED; WET
14 - 15 SAND, BROWNISH, CLAYEY, WELL-GRADED
(TILL)
15 - 18 SAND, REDDISH, FAIR TO GOOD GRADING
18 - 21 GRAVEL, CLAYEY, POORLY GRADED

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TEST HOLE NUMBER: 149
LOCATION: 098N-53W-22ABDD
LEGAL LOCATION: SE SE NW NE SEC. 22, T. 098 N., R. 53 W.

2 - 11 SAND, SUBROUNDED, WELL-GRADED
11 - 15 SAND AND CLAY, DARK-BROWN WITH BLACK
STRINGERS
15 - 21 SAND, POORLY GRADED
21 - 25 SAND, GRAY, WELL-GRADED
25 - 31 SAND, SUBANGULAR TO ANGULAR, WELL-
GRADED

* * * *

TEST HOLE NUMBER: 150
LOCATION: 098N-53W-22BA
LEGAL LOCATION: NE NW SEC. 22, T. 098 N., R. 53 W.

0 - 29 GRAVEL, FINE; SATURATED AT 8 FEET

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TEST HOLE NUMBER: 151
LOCATION: 098N-53W-22CABD
LEGAL LOCATION: SE NW NE SW SEC. 22, T. 098 N., R. 53 W.

4 - 15 SAND, REDDISH, POORLY GRADED
15 - 19 SAND AND CLAY, POORLY GRADED

* * * *

TEST HOLE NUMBER: 152
LOCATION: 098N-53W-23DDAA
LEGAL LOCATION: NE NE SE SE SEC. 23, T. 098 N., R. 53 W.

3 - 9 SAND, BROWN, MEDIUM TO COARSE, VERY
CLAYEY, POORLY SORTED; OXIDIZED,
SATURATED AT 7 FEET
9 - 34 SAND AND GRAVEL, BROWN, COARSE SAND,
MEDIUM GRAVEL; OXIDIZED

* * * *

TEST HOLE NUMBER: 153
LOCATION: 098N-53W-25AAAA
LEGAL LOCATION: NE NE NE NE SEC. 25, T. 098 N., R. 53 W.

0 - 5 GRAVEL, BROWN, COARSE, SILTY, SANDY,
POORLY SORTED, SUBANGULAR; MOIST,
OXIDIZED
5 - 6 SAND, BROWN, COARSE, SILTY; SATURATED,
OXIDIZED
6 - 28 GRAVEL, BROWN, FINE, SANDY, MODERATELY
SORTED, SUBANGULAR; SATURATED,
OXIDIZED AT 22 FEET

* * * *

TEST HOLE NUMBER: 154
LOCATION: 098N-53W-26BAAA
LEGAL LOCATION: NE NE NE NW SEC. 26, T. 098 N., R. 53 W.

0 - 63 GRAVEL, FINE TO MEDIUM

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TEST HOLE NUMBER: 155
LOCATION: 098N-53W-31BABA
LEGAL LOCATION: NE NW NE NW SEC. 31, T. 098 N., R. 53 W.

4 - 7 SAND, LIGHT-BROWN, SILTY, CLAYEY;
SATURATED

* * * *

TEST HOLE NUMBER: 156
LOCATION: 098N-53W-32BADC
LEGAL LOCATION: SW SE NE NW SEC. 32, T. 098 N., R. 53 W.

1 - 9 SAND, DARK-BROWN, FINE, POORLY GRADED

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TEST HOLE NUMBER: 157
LOCATION: 098N-53W-32BCAD
LEGAL LOCATION: SE NE SW NW SEC. 32, T. 098 N., R. 53 W.

1 - 5 SAND, BROWN, FINE TO MEDIUM, SILTY

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TEST HOLE NUMBER: 158
LOCATION: 098N-53W-36AAAA
LEGAL LOCATION: NE NE NE NE SEC. 36, T. 098 N., R. 53 W.

1 - 3 SAND, BROWN, COARSE, CLAYEY, POORLY
SORTED; SATURATED, OXIDIZED, GETS
COARSER WITH DEPTH
3 - 40 GRAVEL, MEDIUM TO COARSE, SILTY, POORLY
SORTED; SATURATED, OXIDIZED, UNOXIDIZED
AT 23 FEET

* * * *

TEST HOLE NUMBER: 159
LOCATION: 098N-54W-07DDDC
LEGAL LOCATION: SW SE SE SE SEC. 07, T. 098 N., R. 54 W.

4 - 22 SAND, BROWN, MEDIUM TO COARSE, VERY
CLAYEY, SILTY; SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 160
LOCATION: 098N-54W-15DCCC
LEGAL LOCATION: SW SW SW SE SEC. 15, T. 098 N., R. 54 W.

2 - 10 SAND, BROWN, MEDIUM TO COARSE, GRAVELLY,
SILTY; SATURATED, OXIDIZED, SOME CLAY
23 - 28 GRAVEL, COARSE, WELL-ROUNDED

* * * *

TEST HOLE NUMBER: 161
LOCATION: 098N-54W-25BBBB
LEGAL LOCATION: NW NW NW NW SEC. 25, T. 098 N., R. 54 W.

10 - 12 SAND, BROWN, MEDIUM TO COARSE, VERY
CLAYEY, SILTY, PEBBLY; SATURATED,
OXIDIZED
12 - 30 SAND, BROWN, MEDIUM TO COARSE, GRAVELLY;
SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 162
LOCATION: 098N-54W-26DDDD
LEGAL LOCATION: SE SE SE SE SEC. 26, T. 098 N., R. 54 W.

1 - 16 SAND, COARSE, WITH GRAVEL

* * * *

TEST HOLE NUMBER: 163
LOCATION: 098N-54W-31BCCC
LEGAL LOCATION: SW SW SW NW SEC. 31, T. 098 N., R. 54 W.

12 - 20 SAND, FINE, VERY CLAYEY

* * * *

TEST HOLE NUMBER: 164
LOCATION: 098N-54W-31CCCB
LEGAL LOCATION: NW SW SW SW SEC. 31, T. 098 N., R. 54 W.

0 - 9 SAND AND GRAVEL, MEDIUM SAND TO MEDIUM
PEBBLE GRAVEL; WIDE VARIETY OF ROCK
TYPES; TOPSOIL FROM 0 TO 2 FEET

* * * *

TEST HOLE NUMBER: 165
LOCATION: 098N-54W-35DADD
LEGAL LOCATION: SE SE NE SE SEC. 35, T. 098 N., R. 54 W.

9 - 14 SAND, GRAY, COARSE, VERY CLAYEY;
SATURATED
14 - 21 SAND AND GRAVEL, GRAY, COARSE SAND, FINE
PEBBLE GRAVEL; SOME CLAY, SATURATED

* * * *

TEST HOLE NUMBER: 166
LOCATION: 098N-54W-36AAAA
LEGAL LOCATION: NE NE NE NE SEC. 36, T. 098 N., R. 54 W.

2 - 10 GRAVEL, BROWN, MEDIUM
12 - 14 GRAVEL, FINE TO MEDIUM

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TEST HOLE NUMBER: 167
LOCATION: 098N-55W-14BCCC
LEGAL LOCATION: SW SW SW NW SEC. 14, T. 098 N., R. 55 W.

4 - 34 SAND AND GRAVEL, BROWN, MEDIUM SAND, FINE
GRAVEL; SATURATED, OXIDIZED, SOME CLAY

* * * *

TEST HOLE NUMBER: 168
LOCATION: 098N-55W-16ADAD
LEGAL LOCATION: SE NE SE NE SEC. 16, T. 098 N., R. 55 W.

19 - 42 SAND AND GRAVEL, MEDIUM SAND TO MEDIUM
PEBBLE GRAVEL; WIDE VARIETY OF ROCK
TYPES; DRILLER REPORTED TILL

* * * *

TEST HOLE NUMBER: 169
LOCATION: 098N-55W-18DDAD
LEGAL LOCATION: SE NE SE SE SEC. 18, T. 098 N., R. 55 W.

3 - 24 SAND, GRAY, VERY FINE, VERY SILTY, VERY
CLAYEY; SATURATED, SOME THIN GRAVEL
STRINGERS

* * * *

TEST HOLE NUMBER: 170
LOCATION: 098N-55W-20DDDC
LEGAL LOCATION: SW SE SE SE SEC. 20, T. 098 N., R. 55 W.

6 - 16 SAND, WHITE, FINE, WELL-SORTED; OXIDIZED,
SATURATED, CLEAN

* * * *

TEST HOLE NUMBER: 171
LOCATION: 098N-55W-23CBBB
LEGAL LOCATION: NW NW NW SW SEC. 23, T. 098 N., R. 55 W.

4 - 26 SAND, BROWN, MEDIUM, SILTY; SATURATED,
VERY COBBLY FROM 14 TO 22 FEET

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TEST HOLE NUMBER: 172
LOCATION: 098N-55W-36AAAA
LEGAL LOCATION: NE NE NE NE SEC. 36, T. 098 N., R. 55 W.

6 - 10 SAND AND GRAVEL, YELLOWISH-BROWN, FINE
SAND TO FINE PEBBLE GRAVEL; WIDE
VARIETY OF ROCK TYPES

* * * *

TEST HOLE NUMBER: 173
LOCATION: 099N-52W-10DDDD
LEGAL LOCATION: SE SE SE SE SEC. 10, T. 099 N., R. 52 W.

7 - 17 SAND, BROWN, MEDIUM

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TEST HOLE NUMBER: 174
LOCATION: 099N-52W-14DCDC
LEGAL LOCATION: SW SE SW SE SEC. 14, T. 099 N., R. 52 W.

7 - 11 SAND, BROWN, FINE TO MEDIUM, CLAYEY,
SILTY; SATURATED

* * * *

TEST HOLE NUMBER: 175
LOCATION: 099N-52W-19AAAA
LEGAL LOCATION: NE NE NE NE SEC. 19, T. 099 N., R. 52 W.

4 - 9 GRAVEL, MEDIUM TO COARSE

* * * *

TEST HOLE NUMBER: 176
LOCATION: 099N-52W-23DAAA
LEGAL LOCATION: NE NE NE SE SEC. 23, T. 099 N., R. 52 W.

12 - 17 SAND, CLAYEY

* * * *

TEST HOLE NUMBER: 177
LOCATION: 099N-52W-25ABB
LEGAL LOCATION: NW NW NE SEC. 25, T. 099 N., R. 52 W.

10 - 12 SAND, RUST-COLORED, SUBANGULAR, POORLY
GRADED
12 - 14 SAND AND CLAY; OCCASIONAL THIN SAND
LENSES
14 - 21 SAND, RUST-COLORED, SUBANGULAR, WELL-
GRADED
21 - 22 SAND, RUST-COLORED, POORLY GRADED

* * * *

TEST HOLE NUMBER: 178
LOCATION: 099N-52W-25BAAA
LEGAL LOCATION: NE NE NE NW SEC. 25, T. 099 N., R. 52 W.

5 - 22 GRAVEL, BROWN

* * * *

TEST HOLE NUMBER: 179
LOCATION: 099N-52W-31CACC
LEGAL LOCATION: SW SW NE SW SEC. 31, T. 099 N., R. 52 W.

1 - 4 SAND, FINE
4 - 5 SAND
5 - 32 SAND, ANGULAR

* * * *

TEST HOLE NUMBER: 180
LOCATION: 099N-52W-31CDDD
LEGAL LOCATION: SE SE SE SW SEC. 31, T. 099 N., R. 52 W.

1 - 17 SAND AND GRAVEL, BROWN, INTERBEDDED
17 - 32 SAND, GRAY, MEDIUM

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TEST HOLE NUMBER: 181
LOCATION: 099N-53W-02BCCB
LEGAL LOCATION: NW SW SW NW SEC. 02, T. 099 N., R. 53 W.

5 - 36 GRAVEL, MEDIUM, SANDY; SOME COBBLES, TOO
COARSE TO CONTINUE BEYOND 36 FEET

* * * *

TEST HOLE NUMBER: 182
LOCATION: 099N-53W-03BABA
LEGAL LOCATION: NE NW NE NW SEC. 03, T. 099 N., R. 53 W.

3 - 16 SAND AND GRAVEL, MEDIUM TO COARSE

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TEST HOLE NUMBER: 183
LOCATION: 099N-53W-04DCCC
LEGAL LOCATION: SW SW SW SE SEC. 04, T. 099 N., R. 53 W.

0 - 18 SAND AND GRAVEL, REDDISH-BROWN, FINE SAND
TO COARSE GRAVEL, SILTY; DRY, OXIDIZED,
SATURATED AT 9 FEET
18 - 37 SAND AND GRAVEL, REDDISH-BROWN, FINE SAND
TO MEDIUM GRAVEL, VERY SILTY, CLAYEY;
SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 184
LOCATION: 099N-53W-07CBCC
LEGAL LOCATION: SW SW NW SW SEC. 07, T. 099 N., R. 53 W.

5 - 15 SAND AND GRAVEL, BROWN, FINE SAND TO
MEDIUM GRAVEL, SILTY; MOIST, OXIDIZED,
SATURATED AT 10 FEET
15 - 20 SAND, REDDISH-BROWN, MEDIUM TO COARSE,
SILTY; SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 185
LOCATION: 099N-53W-07DADD
LEGAL LOCATION: SE SE NE SE SEC. 07, T. 099 N., R. 53 W.

0 - 20 SAND AND GRAVEL, REDDISH-BROWN, COARSE
SAND TO FINE AND MEDIUM PEBBLE GRAVEL,
CLAYEY; DRY, OXIDIZED, SATURATED AT 5
FEET

* * * *

TEST HOLE NUMBER: 186
LOCATION: 099N-53W-09CDDD
LEGAL LOCATION: SE SE SE SW SEC. 09, T. 099 N., R. 53 W.

1 - 7 SAND, BROWN, FINE; DRY, OXIDIZED, SOME
FINE GRAVEL, SATURATED AT 6 FEET
7 - 22 GRAVEL, BROWN, MEDIUM, SANDY; SATURATED,
OXIDIZED
22 - 40 GRAVEL, BROWN, FINE, SILTY, SANDY;
SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 187
LOCATION: 099N-53W-10AAAB
LEGAL LOCATION: NW NE NE NE SEC. 10, T. 099 N., R. 53 W.

4 - 43 SAND AND GRAVEL, REDDISH-BROWN, COARSE
SAND TO MEDIUM PEBBLE GRAVEL, CLAYEY;
OXIDIZED, SATURATED, BECOMES COARSER AT
34 FEET, HOLE ABANDONED AT 43 FEET DUE
TO LARGE ROCK

* * * *

TEST HOLE NUMBER: 188
LOCATION: 099N-53W-10CBBC
LEGAL LOCATION: SW NW NW SW SEC. 10, T. 099 N., R. 53 W.

1 - 7 SAND AND GRAVEL, REDDISH-BROWN, COARSE
SAND, FINE TO MEDIUM PEBBLE GRAVEL;
OXIDIZED, DRY
7 - 14 GRAVEL, REDDISH-BROWN, MEDIUM TO COARSE;
OXIDIZED, DRY
14 - 20 SAND AND GRAVEL, COARSE SAND, FINE TO
MEDIUM PEBBLE GRAVEL; OXIDIZED,
SATURATED

* * * *

TEST HOLE NUMBER: 189
LOCATION: 099N-53W-14BAAA
LEGAL LOCATION: NE NE NE NW SEC. 14, T. 099 N., R. 53 W.

0 - 3 SAND AND GRAVEL, FINE SAND, MEDIUM GRAVEL
3 - 10 GRAVEL, FINE; WITH MANY COBBLES
10 - 12 GRAVEL, COARSE; TOO COARSE TO CONTINUE

* * * *

TEST HOLE NUMBER: 190
LOCATION: 099N-53W-15BCBC
LEGAL LOCATION: SW NW SW NW SEC. 15, T. 099 N., R. 53 W.

3 -	6	SAND, MEDIUM TO COARSE
6 -	10	GRAVEL, MEDIUM TO COARSE
10 -	13	SAND, FINE TO COARSE
13 -	28	GRAVEL, FINE TO COARSE

* * * *

TEST HOLE NUMBER: 191
LOCATION: 099N-53W-16AADD
LEGAL LOCATION: SE SE NE NE SEC. 16, T. 099 N., R. 53 W.

5 -	17	SAND AND GRAVEL; DIRTY
17 -	25	GRAVEL, COARSE
25 -	32	SAND AND GRAVEL; DIRTY

* * * *

TEST HOLE NUMBER: 192
LOCATION: 099N-53W-18BBCC
LEGAL LOCATION: SW SW NW NW SEC. 18, T. 099 N., R. 53 W.

0 -	27	SAND AND GRAVEL, BROWN, FINE SAND TO COARSE GRAVEL, SILTY; DRY, OXIDIZED, MOIST AT 9 FEET
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TEST HOLE NUMBER: 193
LOCATION: 099N-53W-18CCBC
LEGAL LOCATION: SW NW SW SW SEC. 18, T. 099 N., R. 53 W.

4 -	8	SAND, MEDIUM TO COARSE, POORLY SORTED; MOIST
8 -	19	SAND AND GRAVEL, GRAYISH-BROWN, COARSE SAND TO FINE PEBBLE GRAVEL, SLIGHTLY CLAYEY; SATURATED, SOME COARSE GRAVEL

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TEST HOLE NUMBER: 194
LOCATION: 099N-53W-23AD 1
LEGAL LOCATION: SE NE SEC. 23, T. 099 N., R. 53 W.

1 - 6 SAND
11 - 23 SAND AND GRAVEL; SATURATED AT 12 FEET

* * * *

TEST HOLE NUMBER: 195
LOCATION: 099N-53W-23AD 2
LEGAL LOCATION: SE NE SEC. 23, T. 099 N., R. 53 W.

1 - 6 GRAVEL, COARSE
6 - 19 GRAVEL, COARSE; SATURATED AT 7 FEET

* * * *

TEST HOLE NUMBER: 196
LOCATION: 099N-53W-23AD 3
LEGAL LOCATION: SE NE SEC. 23, T. 099 N., R. 53 W.

10 - 30 SAND AND CLAY; SATURATED AT 15 FEET

* * * *

TEST HOLE NUMBER: 197
LOCATION: 099N-53W-23AD 4
LEGAL LOCATION: SE NE SEC. 23, T. 099 N., R. 53 W.

2 - 5 SAND AND CLAY
5 - 26 SAND AND GRAVEL; SATURATED AT 12 FEET

* * * *

TEST HOLE NUMBER: 198
LOCATION: 099N-53W-23BAAA
LEGAL LOCATION: NE NE NE NW SEC. 23, T. 099 N., R. 53 W.

0 - 38 GRAVEL, MEDIUM TO COARSE

* * * *

TEST HOLE NUMBER: 199
LOCATION: 099N-53W-23DCCC 1
LEGAL LOCATION: SW SW SW SE SEC. 23, T. 099 N., R. 53 W.

0 - 20 GRAVEL, YELLOW-BROWN, VERY FINE TO MEDIUM
PEBBLE, SANDY; MOSTLY SUBROUNDED
CARBONATE AND BLACK MUDROCK FRAGMENTS
AND QUARTZ, HIGHLY OXIDIZED

20 - 44 GRAVEL, GRAY, VERY FINE TO MEDIUM PEBBLE,
SANDY; MOSTLY SUBROUNDED CARBONATE AND
BLACK MUDROCK FRAGMENTS AND QUARTZ

* * * *

TEST HOLE NUMBER: 200
LOCATION: 099N-53W-23DCCC 2
LEGAL LOCATION: SW SW SW SE SEC. 23, T. 099 N., R. 53 W.

0 - 25 GRAVEL, YELLOW-BROWN, VERY FINE TO MEDIUM
PEBBLE, SANDY; MOSTLY SUBROUNDED
CARBONATE AND BLACK MUDROCK FRAGMENTS
AND QUARTZ, UNOXIDIZED FROM 20 TO 25
FEET

* * * *

TEST HOLE NUMBER: 201
LOCATION: 099N-53W-26ADDA
LEGAL LOCATION: NE SE SE NE SEC. 26, T. 099 N., R. 53 W.

0 - 25 GRAVEL, YELLOW-BROWN, VERY FINE TO MEDIUM
PEBBLE, SANDY; MOSTLY SUBROUNDED
CARBONATE AND BLACK MUDROCK FRAGMENTS,
HIGHLY OXIDIZED

* * * *

TEST HOLE NUMBER: 202
LOCATION: 099N-53W-27AAAA
LEGAL LOCATION: NE NE NE NE SEC. 27, T. 099 N., R. 53 W.

0 - 4 GRAVEL, BROWN, COARSE, SANDY, POORLY
SORTED, SUBANGULAR; MOIST, OXIDIZED
4 - 48 GRAVEL, BROWN, MEDIUM, CLAYEY, SANDY,
POORLY SORTED, SUBANGULAR; SATURATED,
OXIDIZED

* * * *

TEST HOLE NUMBER: 203
LOCATION: 099N-53W-27BBBB
LEGAL LOCATION: NW NW NW NW SEC. 27, T. 099 N., R. 53 W.

23 - 38 GRAVEL, COARSE, VERY CLAYEY, VERY POORLY
SORTED, ANGULAR; VERY MOIST, OXIDIZED

* * * *

TEST HOLE NUMBER: 204
LOCATION: 099N-53W-27DDDD
LEGAL LOCATION: SE SE SE SE SEC. 27, T. 099 N., R. 53 W.

0 - 57 SAND AND GRAVEL, FINE TO COARSE; WITH
ROCKS

* * * *

TEST HOLE NUMBER: 205
LOCATION: 099N-53W-28BB
LEGAL LOCATION: NW NW SEC. 28, T. 099 N., R. 53 W.

11 - 14 SAND, FINE
14 - 22 SAND, FINE; WITH CLAY
22 - 32 GRAVEL

* * * *

TEST HOLE NUMBER: 206
LOCATION: 099N-53W-28DDDD
LEGAL LOCATION: SE SE SE SE SEC. 28, T. 099 N., R. 53 W.

18 - 42 SAND, BROWN, MEDIUM TO COARSE; SOME
GRAVEL

* * * *

TEST HOLE NUMBER: 207
LOCATION: 099N-53W-34AAAA
LEGAL LOCATION: NE NE NE NE SEC. 34, T. 099 N., R. 53 W.

1 - 8 GRAVEL, BROWN, COARSE, SANDY, POORLY
SORTED, SUBANGULAR; MOIST, OXIDIZED
8 - 52 GRAVEL, BROWN, MEDIUM, SANDY; SATURATED,
SOME CLAY

* * * *

TEST HOLE NUMBER: 208
LOCATION: 099N-53W-35AAAA
LEGAL LOCATION: NE NE NE NE SEC. 35, T. 099 N., R. 53 W.

3 - 43 SAND, BROWN, VERY COARSE; SOME FINE
GRAVEL

* * * *

TEST HOLE NUMBER: 209
LOCATION: 099N-53W-36AAAA
LEGAL LOCATION: NE NE NE NE SEC. 36, T. 099 N., R. 53 W.

8 - 21 SAND; WITH MEDIUM TO COARSE GRAVEL

* * * *

TEST HOLE NUMBER: 210
LOCATION: 099N-54W-03DDDD
LEGAL LOCATION: SE SE SE SE SEC. 03, T. 099 N., R. 54 W.

0 - 35 SAND, FINE TO COARSE; WITH PEA GRAVEL

* * * *

TEST HOLE NUMBER: 211
LOCATION: 099N-54W-04DDDD
LEGAL LOCATION: SE SE SE SE SEC. 04, T. 099 N., R. 54 W.

0 - 30 GRAVEL (TERRACE DEPOSITS)

* * * *

TEST HOLE NUMBER: 212
LOCATION: 099N-54W-11BBAB
LEGAL LOCATION: NW NE NW NW SEC. 11, T. 099 N., R. 54 W.

0 - 16 SAND AND GRAVEL, FINE SAND TO MEDIUM
PEBBLE GRAVEL; WIDE VARIETY OF ROCKS

* * * *

TEST HOLE NUMBER: 213
LOCATION: 099N-54W-13BBAA
LEGAL LOCATION: NE NE NW NW SEC. 13, T. 099 N., R. 54 W.

10 - 15 SAND, COARSE, SLIGHTLY CLAYEY, POORLY
SORTED; OXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 214
LOCATION: 099N-54W-14BBAA
LEGAL LOCATION: NE NE NW NW SEC. 14, T. 099 N., R. 54 W.

15 - 25 GRAVEL, PEA-SIZE; IRON-STAINED

* * * *

TEST HOLE NUMBER: 215
LOCATION: 099N-54W-21AADD
LEGAL LOCATION: SE SE NE NE SEC. 21, T. 099 N., R. 54 W.

1 - 5 SAND AND GRAVEL; TREE ROOT AT 5 FEET

* * * *

TEST HOLE NUMBER: 216
LOCATION: 100N-52W-08ADAB
LEGAL LOCATION: NW NE SE NE SEC. 08, T. 100 N., R. 52 W.

4 - 6 GRAVEL, COARSE, WELL-ROUNDED; MOIST
13 - 24 SAND, BROWN, MEDIUM TO COARSE, SILTY,
PEBBLY; SATURATED, OXIDIZED
24 - 27 GRAVEL, COARSE; SATURATED, ABANDONED DUE
TO ROCK

* * * *

TEST HOLE NUMBER: 217
LOCATION: 100N-52W-12CBCC
LEGAL LOCATION: SW SW NW SW SEC. 12, T. 100 N., R. 52 W.

1 - 2 GRAVEL, BROWN, MEDIUM, SANDY; DRY
2 - 7 SAND, BROWN, MEDIUM; MOIST, OXIDIZED,
SATURATED AT 5 FEET

* * * *

TEST HOLE NUMBER: 218
LOCATION: 100N-52W-14DCDC
LEGAL LOCATION: SW SE SW SE SEC. 14, T. 100 N., R. 52 W.

0 - 57 SAND AND GRAVEL, FINE SAND TO FINE PEBBLE
GRAVEL; SOME MEDIUM PEBBLES NEAR BOTTOM
OF INTERVAL; WIDE VARIETY OF ROCK TYPES

* * * *

TEST HOLE NUMBER: 219
LOCATION: 100N-52W-33DDDC
LEGAL LOCATION: SW SE SE SE SEC. 33, T. 100 N., R. 52 W.

0 - 4 GRAVEL, BROWN, MEDIUM, SANDY; DRY

* * * *

TEST HOLE NUMBER: 220
LOCATION: 100N-53W-08CCCD
LEGAL LOCATION: SE SW SW SW SEC. 08, T. 100 N., R. 53 W.

4 - 16 SAND, MEDIUM, CLAYEY, SILTY
19 - 28 GRAVEL, COARSE; TOO COARSE TO CONTINUE
BEYOND 28 FEET

* * * *

TEST HOLE NUMBER: 221
LOCATION: 100N-53W-20DCDD
LEGAL LOCATION: SE SE SW SE SEC. 20, T. 100 N., R. 53 W.

1 - 3 GRAVEL, COARSE, SANDY
3 - 27 GRAVEL, FINE TO MEDIUM, SANDY; SATURATED
AT 15 FEET

* * * *

TEST HOLE NUMBER: 222
LOCATION: 100N-53W-28BBBB
LEGAL LOCATION: NW NW NW NW SEC. 28, T. 100 N., R. 53 W.

1 - 37 GRAVEL, BROWN; LOTS OF VERY COARSE SAND
AND ROCKS

* * * *

TEST HOLE NUMBER: 223
LOCATION: 100N-53W-33BAAA
LEGAL LOCATION: NE NE NE NW SEC. 33, T. 100 N., R. 53 W.

0 - 2 SAND, BROWN, SILTY; DRY, TOO ROCKY TO
CONTINUE

* * * *

TEST HOLE NUMBER: 224
LOCATION: 100N-53W-33BBAA
LEGAL LOCATION: NE NE NW NW SEC. 33, T. 100 N., R. 53 W.

20 - 22 SAND, VERY CLAYEY; VERY MOIST

* * * *

TEST HOLE NUMBER: 225
LOCATION: 100N-53W-33DADA
LEGAL LOCATION: NE SE NE SE SEC. 33, T. 100 N., R. 53 W.

9 - 24 SAND, BROWN, MEDIUM, SILTY, SLIGHTLY
CLAYEY; SATURATED, OXIDIZED
24 - 30 SAND, GRAY-BROWN, FINE, SILTY; SATURATED

* * * *

TEST HOLE NUMBER: 226
LOCATION: 100N-54W-12DADD
LEGAL LOCATION: SE SE NE SE SEC. 12, T. 100 N., R. 54 W.

4 - 20 SAND, BROWN, FINE, VERY CLAYEY, VERY
SILTY; SATURATED

* * * *

TEST HOLE NUMBER: 227
LOCATION: 100N-54W-14CBBB
LEGAL LOCATION: NW NW NW SW SEC. 14, T. 100 N., R. 54 W.

4 - 6 SAND, FINE, SILTY, CLAYEY

* * * *

TEST HOLE NUMBER: 228
LOCATION: 100N-54W-28DDDD
LEGAL LOCATION: SE SE SE SE SEC. 28, T. 100 N., R. 54 W.

0 - 45 SAND, BUFF

* * * *

TEST HOLE NUMBER: 229
LOCATION: 100N-54W-29DDDD
LEGAL LOCATION: SE SE SE SE SEC. 29, T. 100 N., R. 54 W.

0 - 9 GRAVEL; OXIDIZED
11 - 17 SAND, COARSE

* * * *

TEST HOLE NUMBER: 230
LOCATION: 100N-54W-31ADDD
LEGAL LOCATION: SE SE SE NE SEC. 31, T. 100 N., R. 54 W.

5 - 17 GRAVEL, PEA-SIZED; OXIDIZED

* * * *

TEST HOLE NUMBER: 231
LOCATION: 100N-54W-33DAAA
LEGAL LOCATION: NE NE NE SE SEC. 33, T. 100 N., R. 54 W.

0 - 5 SAND AND GRAVEL, REDDISH-BROWN, COARSE
SAND, FINE TO MEDIUM PEBBLE GRAVEL;
OXIDIZED, DRY
10 - 14 SAND, FINE TO MEDIUM, POORLY SORTED;
OXIDIZED, SATURATED, SOME CLAY

* * * *

TEST HOLE NUMBER: 232
LOCATION: 100N-55W-10CDDD
LEGAL LOCATION: SE SE SE SW SEC. 10, T. 100 N., R. 55 W.

1 - 11 GRAVEL, BROWN, FINE, SANDY; SATURATED,
OXIDIZED

* * * *

TEST HOLE NUMBER: 233
LOCATION: 100N-55W-15DDDC
LEGAL LOCATION: SW SE SE SE SEC. 15, T. 100 N., R. 55 W.

2 - 21 SAND AND GRAVEL, YELLOW-BROWN, MEDIUM
SAND TO MEDIUM PEBBLE GRAVEL; MOSTLY
SUBROUNDED TO SUBANGULAR AND ASSORTED
IGNEOUS AND METAMORPHIC ROCK FRAGMENTS
AND QUARTZ, OXIDIZED

* * * *

TEST HOLE NUMBER: 234
LOCATION: 100N-55W-16DDDD
LEGAL LOCATION: SE SE SE SE SEC. 16, T. 100 N., R. 55 W.

4 - 9 SAND, BROWN, VERY FINE, SILTY; OXIDIZED,
SATURATED

* * * *

TEST HOLE NUMBER: 235
LOCATION: 100N-55W-17AAAA 1
LEGAL LOCATION: NE NE NE NE SEC. 17, T. 100 N., R. 55 W.

1 - 5 SAND, CLAYEY, POORLY SORTED; OXIDIZED,
MOIST
5 - 21 SAND AND GRAVEL, ORANGE-BROWN, COARSE
SAND, FINE PEBBLE GRAVEL; OXIDIZED,
SATURATED

* * * *

TEST HOLE NUMBER: 236
LOCATION: 100N-55W-17AAAA 2
LEGAL LOCATION: NE NE NE NE SEC. 17, T. 100 N., R. 55 W.

7 - 13 SAND, BROWN, FINE TO MEDIUM, SILTY,
CLAYEY; SATURATED, OXIDIZED
13 - 20 SAND AND GRAVEL, BROWN, MEDIUM SAND TO
FINE GRAVEL, SILTY; SATURATED, OXI-
DIZED

* * * *

TEST HOLE NUMBER: 237
LOCATION: 100N-55W-17AAAA 3
LEGAL LOCATION: NE NE NE NE SEC. 17, T. 100 N., R. 55 W.

5 - 7 SAND AND GRAVEL, REDDISH-BROWN, COARSE
SAND TO VERY FINE PEBBLE GRAVEL;
OXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 238
LOCATION: 100N-55W-17AAAA 9
LEGAL LOCATION: NE NE NE NE SEC. 17, T. 100 N., R. 55 W.

11 - 37 SAND, FINE; WITH COMPLETELY SATURATED
BROWN CLAY, TURNED GRAYISH AT 30 FEET

* * * *

TEST HOLE NUMBER: 239
LOCATION: 100N-55W-17DDDD

LEGAL LOCATION: SE SE SE SE SEC. 17, T. 100 N., R. 55 W.

25 - 42 SAND, MEDIUM TO VERY COARSE, GRAVELLY;
MOSTLY SUBROUND CARBONATE, BLACK MUD-
ROCK FRAGMENTS AND QUARTZ, SILTY TO
CLAYEY

* * * *

TEST HOLE NUMBER: 240
LOCATION: 100N-55W-23DDAB
LEGAL LOCATION: NW NE SE SE SEC. 23, T. 100 N., R. 55 W.

0 - 30 SAND AND GRAVEL

* * * *

TEST HOLE NUMBER: 241
LOCATION: 100N-55W-23DDCB
LEGAL LOCATION: SW SW SE SE SEC. 23, T. 100 N., R. 55 W.

1 - 4 GRAVEL, BROWN, MEDIUM, SANDY; SATURATED
4 - 6 SAND, BROWN, MEDIUM TO COARSE; SATURATED
6 - 14 GRAVEL, COARSE; FINE TO MEDIUM AT 8 FEET,
SATURATED

* * * *

TEST HOLE NUMBER: 242
LOCATION: 100N-55W-24CCCB
LEGAL LOCATION: NW SW SW SW SEC. 24, T. 100 N., R. 55 W.

0 - 12 GRAVEL, MEDIUM TO COARSE, POORLY SORTED,
ANGULAR; MOIST, OXIDIZED, SOME CLAY,
SATURATED AT 9 FEET
12 - 20 GRAVEL, BROWN, FINE TO MEDIUM, CLAYEY,
MODERATELY SORTED, SUBANGULAR;
SATURATED, OXIDIZED

* * * *

TEST HOLE NUMBER: 243
LOCATION: 100N-55W-26DDDD
LEGAL LOCATION: SE SE SE SE SEC. 26, T. 100 N., R. 55 W.

6 - 38 SAND AND GRAVEL, REDDISH-BROWN, COARSE
SAND, FINE PEBBLE GRAVEL, CLAYEY;

OXIDIZED, SATURATED

* * * *

TEST HOLE NUMBER: 244

LOCATION: 100N-55W-36AAAA

LEGAL LOCATION: NE NE NE NE SEC. 36, T. 100 N., R. 55 W.

17 - 21 SAND, RUSTY-BROWN, COARSE TO VERY COARSE,
PEBBLY

* * * *

TABLE 2. List of sand and gravel pits in Turner County, South Dakota, which are on file at the District Office, South Dakota Department of Transportation, Division of Highways, Mitchell, South Dakota.

EXPLANATION:

Column Description:

- a. Landowner and address
- b. Location - given in half and quarter sections, section number, township, and range
- c. Aggregate type
- d. Average thickness of deposits in feet
- e. Average thickness of overburden in feet.

Pit 1

- a. Landowner: Arnie Voog - Viborg
- b. Location: SE 1/4 sec. 6, T. 96 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 8.3
- e. Overburden thickness (ft): 3.3

Pit 2

- a. Landowner: Warren Welsh - Centerville
- b. Location: SE 1/4 sec. 8, T. 96 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 6.3
- e. Overburden thickness (ft): 3

Pit 3

- a. Landowner: Florence P. Welsh - Centerville
- b. Location: SE 1/4 sec. 8, T. 96 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 4

- a. Landowner: Ralph Wiese - Centerville
- b. Location: SE 1/4 SW 1/4 sec. 16, T. 96 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 12
- e. Overburden thickness (ft): 2

Pit 5

- a. Landowner: E. G. Rist - Centerville
- b. Location: NE 1/4 SW 1/4 sec. 17, T. 96 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 6.9
- e. Overburden thickness (ft): 3.6

Pit 6

- a. Landowner: E. G. Rist - Centerville
- b. Location: SE 1/4 sec. 17, T. 96 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 8
- e. Overburden thickness (ft): 2

Pit 7

- a. Landowner: Everett C. Olson - Centerville
- b. Location: SW 1/4 sec. 28, T. 96 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 8

- a. Landowner: K. B. Hayne - Centerville
- b. Location: W 1/2 SE 1/4 sec. 31, T. 97 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 10
- e. Overburden thickness (ft): 3.5

Pit 9

- a. Landowner: Alden L. Tiezen - Hurley
- b. Location: W 1/2 SW 1/4 sec. 6, T. 97 N., R. 54 W.
- c. Aggregate type: Sand
- d. Deposit thickness (ft): 12.9
- e. Overburden thickness (ft): 5.7

Pit 10

- a. Landowner: ----
- b. Location: SW 1/4 sec. 5, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 11

- a. Landowner: Raymond Ihnen - Hurley
- b. Location: NE 1/4 sec. 7, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 12

- a. Landowner: Mrs. Dave Schroedermeier - Hurley
- b. Location: W 1/2 SW 1/4 sec. 7, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 11
- e. Overburden thickness (ft): 2.3

Pit 13

- a. Landowner: Mrs. Dave Schroedermeier - Hurley
- b. Location: E 1/2 NE 1/4 sec. 7, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 14

- a. Landowner: Dick and Robert Reiners - Worthing
- b. Location: SW 1/4 sec. 18, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 6.2
- e. Overburden thickness (ft): 2

Pit 15

- a. Landowner: Turner County
- b. Location: SE 1/4 SW 1/4 sec. 19, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 16

- a. Landowner: Cooper
- b. Location: NW 1/4 sec. 20, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 17

- a. Landowner: Luverne Kuper - Lennox
- b. Location: NW 1/4 sec. 20, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 18

- a. Landowner: Ben Knock - Sioux Falls
- b. Location: SW 1/4 sec. 29, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 5
- e. Overburden thickness (ft): 2.5

Pit 19

- a. Landowner: Milo Hanson - Hurley
- b. Location: NW 1/4 NW 1/4 sec. 30, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 10
- e. Overburden thickness (ft): 2.5

Pit 20

- a. Landowner: Allen W. Benson - Hurley
- b. Location: NW 1/4 sec. 30, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 8
- e. Overburden thickness (ft): 2

Pit 21

- a. Landowner: William Haines - Hurley
- b. Location: SE 1/4 sec. 30, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 22

- a. Landowner: Keith Curtis - Hurley
- b. Location: SW 1/4 sec. 30, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 23

- a. Landowner: William Haines - Hurley
- b. Location: SE 1/4 NW 1/4 sec. 30, T. 98 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 8.2+
- e. Overburden thickness (ft): 1.2

Pit 24

- a. Landowner: Jess R. Steward - Hurley
- b. Location: E 1/2 SW 1/4 sec. 1, T. 98 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 10
- e. Overburden thickness (ft): 2

Pit 25

- a. Landowner: Gillas Stern - Freeman
- b. Location: E 1/2 SW 1/4 sec. 1, T. 98 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 26

- a. Landowner: Ruth Christensen - Parker
- b. Location: E 1/2 SW 1/4 sec. 1, T. 98 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 27

- a. Landowner: Bruce Peterson - Sioux Falls
- b. Location: NW 1/4 NW 1/4 sec. 2, T. 98 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 11.9
- e. Overburden thickness (ft): 1.5

Pit 28

- a. Landowner: Merle Flyger - Hurley
- b. Location: NE 1/4 sec. 12, T. 98 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 12
- e. Overburden thickness (ft): 1

Pit 29

- a. Landowner: Lyndin Flegger - Hurley
- b. Location: SE 1/4 sec. 12, T. 98 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 30

- a. Landowner: Gene Kaufman - Freeman
- b. Location: NE 1/4 NW 1/4 sec. 19, T. 98 N., R. 55 W.
- c. Aggregate type: Sand
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 31

- a. Landowner: Gene Kaufman - Freeman
- b. Location: SE 1/4 NE 1/4 sec. 19, T. 98 N., R. 55 W.
- c. Aggregate type: Sand
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 32

- a. Landowner: Gene Kaufman - Freeman
- b. Location: SW 1/4 NE 1/4 sec. 19, T. 98 N., R. 55 W.
- c. Aggregate type: Sand
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 33

- a. Landowner: Ed Hoogstraat - Sioux Falls
- b. Location: SW 1/4 sec. 3, T. 99 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 34

- a. Landowner: ----
- b. Location: SE 1/4 SW 1/4 sec. 3, T. 99 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 35

- a. Landowner: Alvin Plucker - Lennox
- b. Location: E 1/2 SE 1/4 sec. 10, T. 99 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 36

- a. Landowner: Alvin Plucker - Lennox
- b. Location: S 1/2 NE 1/4 sec. 10, T. 99 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 20
- e. Overburden thickness (ft): 2

Pit 37

- a. Landowner: Lawrence Weeldreyer - Lennox
- b. Location: W 1/2 SW 1/4 sec. 11, T. 99 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 38

- a. Landowner: John Plucker - Sioux Falls
- b. Location: SE 1/4 SW 1/4 sec. 14, T. 99 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 39

- a. Landowner: John Rust and A. Erickson
- b. Location: NE 1/4 sec. 23, T. 99 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 40

- a. Landowner: Alvin Plucker - Chancellor
- b. Location: SW 1/4 sec. 24, T. 99 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 7.3
- e. Overburden thickness (ft): 3.3

Pit 41

- a. Landowner: State of South Dakota
- b. Location: SE 1/4 SW 1/4 sec. 7, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 42

- a. Landowner: Martin Tellinghuisen
- b. Location: SW 1/4 sec. 7. T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 43

- a. Landowner: John A. Marquardt - Parker
- b. Location: E 1/2 SE 1/4 sec. 8, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 44

- a. Landowner: Don Van De Rostyne - Parker
- b. Location: N 1/2 sec. 9, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 45

- a. Landowner: Frank Ruppert - Parker
- b. Location: NW 1/4 sec. 9, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 46

- a. Landowner: Alvin Smith - Parker
- b. Location: SW 1/4 sec. 9, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 47

- a. Landowner: Alvin Smith - Parker
- b. Location: SE 1/4 SW 1/4 sec. 9, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 48

- a. Landowner: Kent Plucker
- b. Location: SE 1/4 SW 1/4 sec. 11, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 49

- a. Landowner: Norm Willard - Pierce, Nebraska
- b. Location: NE 1/4 sec. 16, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 50

- a. Landowner: Russel Willadsen - Parker
- b. Location: NW 1/4 NW 1/4 sec. 18, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 51

- a. Landowner: Leonard Schoeberl - Parker
- b. Location: NE 1/4 NW 1/4 sec. 18, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 18
- e. Overburden thickness (ft): 1

Pit 52

- a. Landowner: John C. Walker - Parker
- b. Location: NE 1/4 sec. 22, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 53

- a. Landowner: F. Neeman - Parker
- b. Location: N 1/2 NW 1/4 sec. 25, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 11
- e. Overburden thickness (ft): 2.4

Pit 54

- a. Landowner: Sam Buse - Lennox
- b. Location: NE 1/4 NW 1/4 sec. 25, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 55

- a. Landowner: Herman Plucker - Parker
- b. Location: NE 1/4 sec. 26, T. 99 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 56

- a. Landowner: Ernest Handwerk - Marion
- b. Location: SE 1/4 sec. 3, T. 99 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 57

- a. Landowner: ----
- b. Location: E 1/2 NE 1/4 sec. 10, T. 99 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 58

- a. Landowner: John Clink - Parker
- b. Location: NE 1/4 sec. 13., T. 99 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 10.8
- e. Overburden thickness (ft): 2.9

Pit 59

- a. Landowner: G. G. Poppinga - Chancellor
- b. Location: NW 1/4 sec. 24, T. 100 N., R. 52 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 6.5
- e. Overburden thickness (ft): 2.2

Pit 60

- a. Landowner: Erv Schimkot - Parker
- b. Location: SE 1/4 sec. 20, T. 100 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 61

- a. Landowner: Wilkie J. Johns - Parker
- b. Location: SW 1/4 sec. 21, T. 100 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 62

- a. Landowner: D. Fritz - Parker
- b. Location: N 1/2 SW 1/4 sec. 34, T. 100 N., R. 53 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 8
- e. Overburden thickness (ft): 2

Pit 63

- a. Landowner: Pankratz
- b. Location: SW 1/4 sec. 29, T. 100 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 64

- a. Landowner: Wenzell
- b. Location: SE 1/4 sec. 30, T. 100 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 65

- a. Landowner: DE. Houghton - Marion
- b. Location: S 1/2 NE 1/4 sec. 32, T. 100 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 66

- a. Landowner: Ben T. Kehn - Marion
- b. Location: NW 1/4 sec. 32, T. 100 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 8
- e. Overburden thickness (ft): 2

Pit 67

- a. Landowner: ----
- b. Location: E 1/2 NW 1/4 sec. 33, T. 100 N., R. 54 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 68

- a. Landowner: F. C. Ortman Estate
- b. Location: E 1/2 SE 1/4 sec. 15, T. 100 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 6
- e. Overburden thickness (ft): 0

Pit 69

- a. Landowner: Lena Ortman - Dolton
- b. Location: NE 1/4 sec. 15, T. 100 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 70

- a. Landowner: Mrs. Margret Epps - Marion
- b. Location: S 1/2 SE 1/4 sec. 23, T. 100 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): 10
- e. Overburden thickness (ft): 1.5

Pit 71

- a. Landowner: Lawrence Arbeiter - Marion
- b. Location: SW 1/4 sec. 24, T. 100 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 72

- a. Landowner: Ernest Tieszen - Marion
- b. Location: N 1/2 SE 1/4 sec. 25, T. 100 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 73

- a. Landowner: Clarence Engbrecht - Marion
- b. Location: NE 1/4 sec. 25, T. 100 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 74

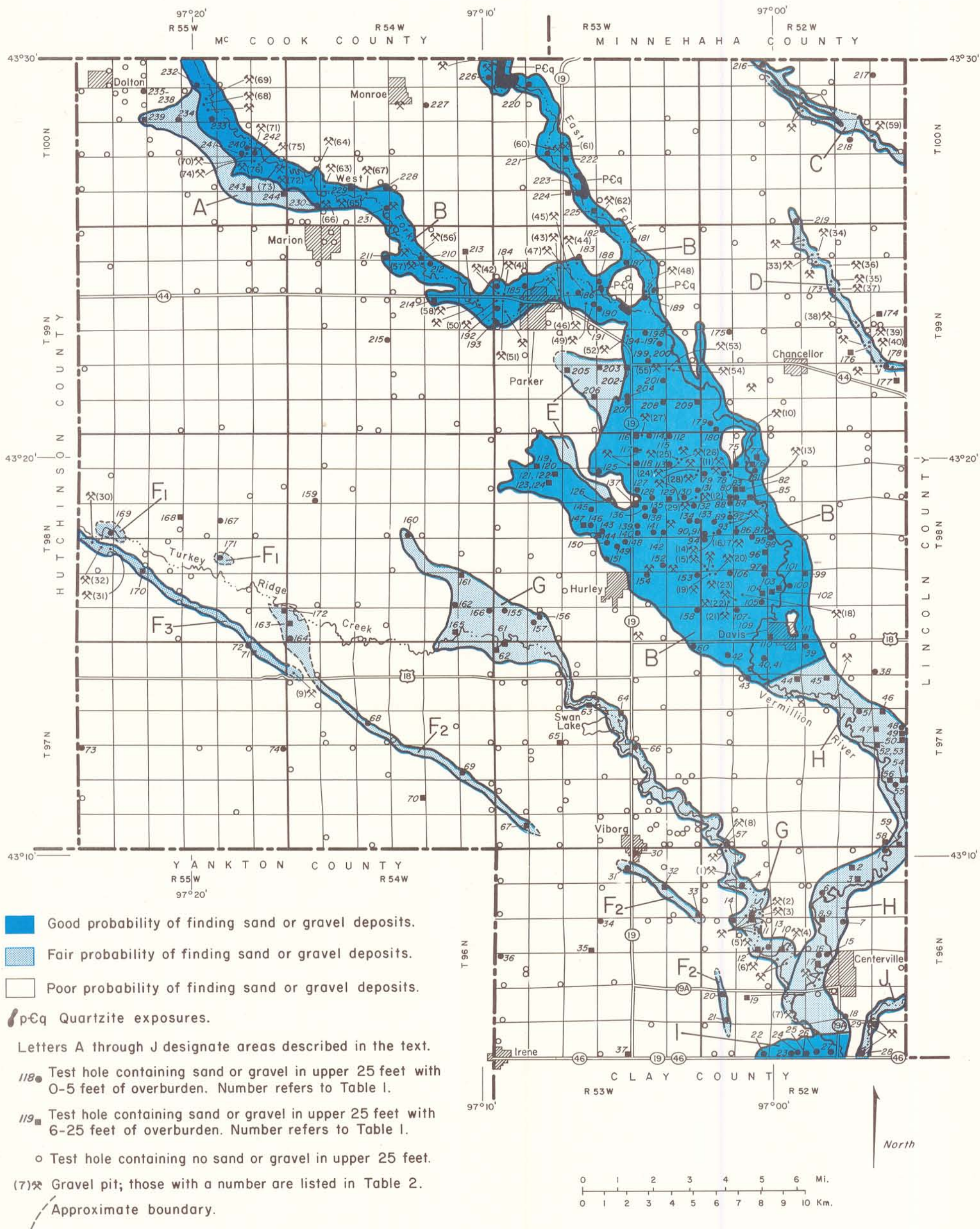
- a. Landowner: Otto Arbeiter - Marion
- b. Location: NW 1/4 NW 1/4 sec. 25, T. 100 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 75

- a. Landowner: Jacob J. Goosen - Marion
- b. Location: SW 1/4 NW 1/4 sec. 25, T. 100 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----

Pit 76

- a. Landowner: Mrs. Margret Epps - Marion
- b. Location: NE 1/4 NE 1/4 sec. 26, T. 100 N., R. 55 W.
- c. Aggregate type: Gravel
- d. Deposit thickness (ft): ----
- e. Overburden thickness (ft): ----



Map showing test holes, gravel pits, and sand and gravel deposits in Turner County.