GROUND-WATER DATA

for

McHENRY COUNTY, NORTH DAKOTA

by

P. G. Randich

U.S. Geological Survey

COUNTY GROUND-WATER STUDIES 33 — PART II
North Dakota State Water Commission
Vernon Fahy, *State Engineer*

BULLETIN 74 — PART II
North Dakota Geological Survey
Lee Gerhard, *State Geologist*

Prepared by the U.S. Geological Survey
in cooperation with the North Dakota Geological Survey,
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Bismarck, North Dakota

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SELECTED FACTORS FOR CONVERTING INCH-POUND UNITS TO THE INTERNATIONAL SYSTEM (SI) OF METRIC UNITS

A dual system of measurements--inch-pound units and the International System (SI) of metric units--is given in this report. SI is an organized system of units adopted by the 11th General Conference of Weights and Measures in 1960. Selected factors for converting inch-pound units to SI units are given below.

Multiply inch-pound unit	By	To obtain SI unit
Acre	0.4047	hectare (ha)
Foot (ft)	.3048	meter (m)
Inch (in)	25.4	millimeter (mm)

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INTRODUCTION

The investigation of the geology and occurrence of ground water in McHenry County (fig. 1) was made cooperatively by the U.S. Geological Survey, North Dakota State Water Commission, North Dakota Geological Survey, and McHenry County Water Management District. The results of the investigation will be published in three separate parts. Part I is an interpretive report describing the geology of the study area, part II is a compilation of the ground-water data, and part III is an interpretive report describing the ground-water resources. Part II (this report) makes available geologic and hydrologic data collected during the county investigation and functions as a reference for the other reports.

Purpose

The purpose of the investigation was to provide detailed geologic and hydrologic information needed for the orderly development of water supplies for municipal, domestic, livestock, irrigation, industrial, and similar uses. Specifically, the objectives were to: (1) determine the location, extent, and nature of the major aquifers; (2) evaluate the occurrence and movement of ground water, including the sources of recharge and discharge; (3) estimate the quantities of water stored in the glacial aquifers; (4) estimate the potential yields of wells tapping the major aquifers; (5) evaluate the chemical quality of the ground water; and (6) estimate the water use.

Location-Numbering System

The location-numbering system used in this report is based on the

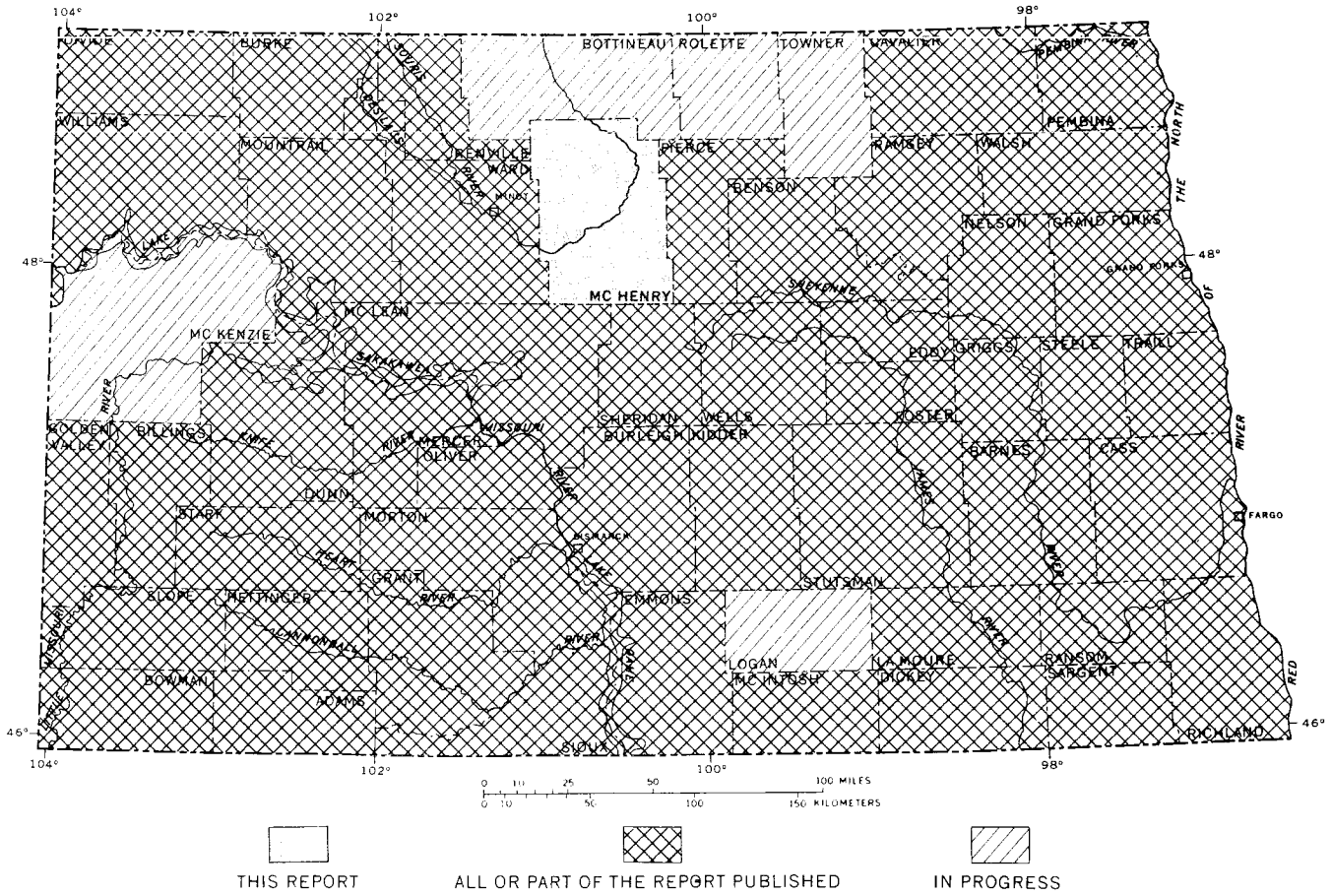

FIGURE 1.—County ground-water studies in North Dakota.

public land classification system used by the U.S. Bureau of Land Management. The system is illustrated in figure 2. The first numeral denotes the township north of a base line, the second numeral denotes the range west of the fifth principal meridian, and the third numeral denotes the section in which the well is located. The letters A, B, C, and D designate, respectively, the northeast, northwest, southwest, and southeast quarter section, quarter-quarter section, and quarter-quarter-quarter section (10-acre or 4-ha tract). For example, well 151-076-15ADC is in the SW¼SE¼NE¼ sec. 15, T. 151 N., R. 76 W. Consecutive terminal numerals are added if more than one well or test hole is recorded within a 10-acre (4-ha) tract. The location of each well and test hole in the tables is shown on plate 1 (in pocket).

Acknowledgments

The collection of data for this report was made possible by the cooperation of residents and officials of McHenry County, who furnished essential information on wells and permitted water-level measurements and the collection of water samples. Particular recognition is due to the following personnel of the North Dakota State Water Commission: G. L. Sunderland, M. V. Glaze, P. A. Burke, and G. J. Calheim for drilling and logging test holes and contributions to the understanding of the stratigraphy, G. O. Muri for chemical analyses of water samples, R. B. Shaver and T. L. Johnson for hydrologic testing, and M. O. Lindvig for scheduling of drilling activities. Special recognition is given to Arden Mathison and Mike Engelhardt of the U.S. Bureau of Reclamation for their contributions of data and assistance. Thanks are due to the various well drillers and drilling companies that furnished drillers' logs and other information in this report.

EXPLANATION OF TABLES AND METHODS OF DATA COLLECTION

The data in this report, which were collected chiefly between 1974 and 1978, are listed in tables 1-8. The points of collection are shown on plate 1. The data consist of the following: (1) geologic and

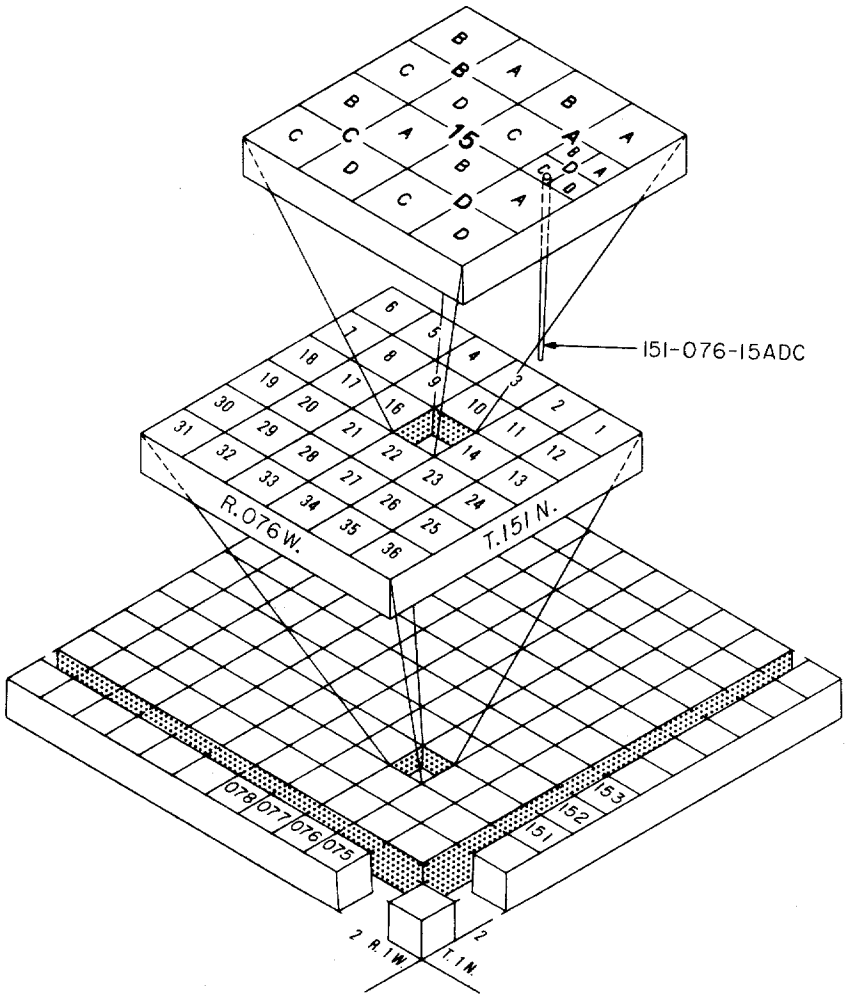

FIGURE 2.—Location-numbering system.

hydrologic records of wells and test holes; (2) water-level measurements in observation wells; (3) lithologic and geophysical logs of test holes and wells; (4) chemical analyses of ground water; (5) chemical analyses of water from streams during low flow; (6) particle-size distribution graphs; (7) analyses of core samples for heavy-mineral content; and (8) hydraulic parameters and statistical characteristics of grain-size analyses. The data are useful for evaluating geologic and ground-water conditions in McHenry County. For example, a person considering the construction of a new well can locate the proposed site on plate 1. Depths, water quality, lithologies, and water levels of nearby wells and test holes tapping the different aquifers can be determined from the tables. However, use of the data as a guide to conditions at different sites should be made with caution because of the lenticular character of the water-bearing rocks and varying water quality in some aquifers.

Records of Wells, Test Holes, and Miscellaneous Data-Collection Sites

Records of selected wells, test holes, and miscellaneous data-collection sites are given in table 1. Well depth is the depth of casing for open-bottom wells or the base of the well screen. Many test holes were converted to observation wells for periodic water-level measurements and water-quality sampling. At some sites two or three observation wells were drilled in order to obtain water levels and water samples from several aquifers. The observation wells were constructed of 1¼-inch (32-mm) plastic casing with 3- or 6-foot (1- or 2-m) screens or 2-inch (51-mm) steel casing with 6-, 10-, or 12-foot (2-, 3-, or 4-m) screens. The observation wells were developed by backwashing and, in some cases, jetting the screened interval; then they were pumped a minimum of 10 hours for development before collection of water samples for analysis.

Water Levels in Selected Wells

Table 2 lists the monthly and intermittent water levels in selected wells, in feet below or (+) above land surface, that tap major aquifers

in McHenry County. Water-level measurements began in 1971 and extended through November 1978. Measurements will continue to be made in several wells as part of the statewide observation-well network to monitor changes in water levels as the ground-water resources of the area are developed.

Logs of Wells and Test Holes

Logs collected from water-well drillers and other sources and logs of test holes drilled as part of this project are included in table 3. Minor changes in word order have been made on some of the drillers' logs and logs from test holes drilled during previous investigations. However, geologic interpretations shown on commercial and private well logs are those of the drillers. Most test holes drilled during this project and some municipal, industrial, and private wells have geophysical logs in addition to a description of the materials penetrated. The geophysical logs are extremely useful for geologic correlation purposes. Grain-size determinations refer to the Wentworth (1922) size scale. The color descriptions were determined by comparing fresh samples with the Geological Society of America's rock color chart (1963).

Water Quality

The mineral constituents and physical properties of water are reported in the tables of analyses (tables 4 and 5). Water for samples was secured from privately owned wells by using the existing pumps and from the North Dakota State Water Commission observation wells by airlift. Generally enough water was pumped to clear the well column and plumbing, then the sample was collected in a polyethylene bottle. For those metals considered unstable, a separate sample was filtered and acidified before transport to the laboratory. Most of the samples were analyzed by the North Dakota State Water Commission, Bismarck, N. Dak. Methods of analyses were generally those described by Brown and others (1970). The results are expressed in milligrams per liter (mg/L) or micrograms per liter (ug/L). A microgram per liter is one-thousandth of a milligram per liter.

Drinking-water standards were established by the National Academy of Sciences-National Academy of Engineering (1972) at the request of the Environmental Protection Agency and are generally accepted as applicable to public water supplies. These standards include the following recommended limits: iron (Fe), 300 ug/L; manganese (Mn), 50 ug/L; sulfate (SO_4), 250 mg/L; and chloride (Cl), 250 mg/L.

The following summation for farmstead use is modified from the Federal Water Pollution Control Administration (1968, p. 116).

KEY WATER QUALITY CRITERIA FOR FARMSTEAD USES

	Recommendations (at point of use)	
Characteristic	*General farmstead uses*	*Additional special-use requirements*
Taste and odor	*Substantially free*	
Odor	*Substantially free*	
pH	*6.0 to 8.5*	*6.8 to 8.5 dairy sanitation*
Total dissolved inorganic solids	*500 mg/L (under certain circumstances, higher levels are acceptable)*	
Turbidity	*Substantially free*	
Hazardous trace elements	*Levels in excess of those shown are grounds for rejection of a supply:*	
	Substances	
	Arsenic (ug/L) — [1]*50*	
	Barium (ug/L) — [1]*1000*	
	Cadmium (ug/L) — [1]*10*	
	Chromium (ug/L) — [1]*50*	
	Cyanides (mg/L) — *0.2*	
	Lead (ug/L) — [1]*50*	
	Selenium (ug/L) — [1]*10*	
	Silver (ug/L) — [1]*50*	
Other trace elements	*Levels shown below should not be exceeded if alternate sources are available:*	
	Substances	
	Manganese (ug/L) — *50*	*In dairy sanitation, water should contain <20 mg/L potassium and <0.1 mg/L iron and copper.*
	Iron (ug/L) — *300*	
	Copper (ug/L) — *1000*	
	Zinc (ug/L) — *5000*	
	Fluoride (mg/L) — *0.7-1.2 ([1]2.4)*	
	Nitrate (as N) (mg/L) — [1]*10*	

[1]*Maximum permitted levels of inorganic chemicals in public water systems of North Dakota; set by the North Dakota State Department of Health (1977).*

Silica (SiO_2)

Weathering processes dissolve silica from practically all rocks. Silica affects the usefulness of water because it can contribute to the formation of scale in pipes, water heaters, and boilers in the presence of calcium and magnesium.

Iron (Fe)

Iron is a widespread constituent in rocks and is easily leached by ground water under reducing conditions or in acidic water. Water containing more than 300 ug/L of iron, after exposure to air, may become discolored. Reddish-brown stains on porcelain or enamelware and fixtures and on fabrics washed in the water result from the iron-imparted turbidity.

Manganese (Mn)

Manganese in concentrations as low as 200 ug/L may cause a dark-brown or black stain on fabrics and porcelain fixtures. Ground water that contains high concentrations of iron may also have considerable amounts of manganese.

Calcium and Magnesium (Ca and Mg)

Limestone and similar rocks are the principal source of calcium and magnesium in natural water. Calcium and magnesium cause water hardness and, with anions, can form scale on utensils and in water heaters, boilers, and pipes.

Sodium and Potassium (Na and K)

Sodium and potassium are present in many igneous and sedimentary rocks. Sodium dissolves readily and when brought into solution it tends to remain in solution. Potassium is dissolved with greater difficulty and exhibits a stronger tendency to be reincorporated into solid weathering products, especially clay minerals. In most natural water the concentration of potassium is much lower than the concentration of sodium. Water that contains a large proportion of sodium salts may

be unsatisfactory for irrigation on certain types of poorly drained soils. The presence of several hundred milligrams per liter of sodium in water can make it unsuitable for use in sodium-restricted diets (North Dakota State Department of Health, 1962).

Bicarbonate and Carbonate (HCO_3 and CO_3)

Bicarbonate and carbonate ions are the major cause of alkalinity in most water. The significance of alkalinity to the domestic, agricultural, and industrial user is usually dependent upon the nature of the cations (Ca, Mg, Na, and K) associated with it. However, moderate amounts of alkalinity do not adversely affect most uses.

Alkalinity can be calculated from the analyses by using the formula:

$$\text{Alkalinity (As } CaCO_3) = 0.82(HCO_3)+1.67(CO_3)$$

Sulfate (SO_4)

Metallic sulfide minerals in both sedimentary and igneous rocks, upon weathering or with bacterial action, are converted to sulfates. Sulfate may also be dissolved from beds of gypsum and deposits of sodium sulfate.

Chloride (Cl)

Chloride is present in all natural waters, but the concentrations usually are low. Important sources of chloride are sedimentary rocks that were deposited under marine conditions.

Fluoride (F)

Fluoride in the ground water is probably derived from solution of fluorite, apatite, and hornblende minerals.

Nitrate (NO_3)

The occurrence of high nitrate concentrations in shallow ground water has been attributed to leaching in feedlots or to fertilizer from irrigated fields where nitrogen compounds have been applied. High nitrate content is undesirable in drinking water because of its bitter taste and it has been reported to cause methemoglobinemia in infants (Comly, 1945).

Boron (B)

Boron is a constituent of the mineral tourmaline and may be present in biotite and amphiboles. In small quantities boron is essential for plant growth. Excessive concentrations in soil and in irrigation water are harmful for some plants.

Dissolved Solids

The concentration of dissolved solids is calculated from the weight of residue on evaporation at 180°C from a known quantity of water.

Properties and Characteristics of Water

Hardness

Calcium and magnesium are the principal cause of hardness. Hardness exhibits the characteristic of requiring greater quantities of soap to produce a lather as the hardness increases. Hard water also can contribute to the formation of scale in boilers, water heaters, radiators, and pipes, with a resultant decrease in the rate of water flow and(or) heat transfer.

The hardness that is equivalent to the alkalinity is called carbonate hardness, and any excess is called noncarbonate hardness. The carbonate hardness is the quantity that will contribute scale on heating, and the noncarbonate hardness is the quantity of hardness that will remain after precipitation of the carbonate hardness. As a general reference, the U.S. Geological Survey often uses the following classification of water hardness.

Calcium and magnesium hardness, as $CaCO_3$ (milligrams per liter)	Hardness description
0-60	Soft
61-120	Moderately hard
121-180	Hard
More than 180	Very hard

Percent Sodium and Sodium-Adsorption Ratio (SAR)

The percent sodium is the percentage of sodium to all cations, with the cations in milliequivalents per liter. The displacement of

calcium and magnesium by sodium in soils is slight unless the percent sodium is considerably higher than 50.

The term SAR (sodium-adsorption ratio) was introduced by the U.S. Salinity Laboratory Staff (1954). Their experiments show that the SAR relates to the degree water enters into cation-exchange reactions with soil. Sodium-adsorption ratio is expressed by the equation:

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

where the concentrations of the ions are expressed in milliequivalents per liter. The U.S. Salinity Laboratory Staff (1954) divided water into 16 classes, depending upon the SAR and specific conductance. The classifications indicate the usefulness of water for irrigation of different crops on different types of soil.

Specific Conductance (micromhos per centimeter at 25°C)

Specific conductance is a measure of the ability of water to conduct an electric current. Approximately 0.65 to 0.70 of the specific conductance (in micromhos) is an estimate of the amount of dissolved solids (in milligrams per liter) in water; however, this relation is not constant and will vary with the chemical composition of the water (Hem, 1970).

Hydrogen-Ion Concentration (pH)

Hydrogen-ion concentration (activity) is expressed in terms of pH units. The values of pH often are used as one measure of the solvent power of water.

The hydrogen-ion concentrations affect the corrosiveness of water. A pH of 7.0 indicates that the water is neutral, neither acidic nor basic. Readings progressively lower than 7.0 denote increasing acidity, and those progressively higher than 7.0 denote increasing alkalinity.

Temperature

Temperature is an important factor in evaluating the usefulness of water. This is evident for such a direct use as an industrial coolant. Temperature is also important, but perhaps not so evident, for its

influence upon concentrations of dissolved gases and mineral matter in water. Water temperatures given in the tables are expressed in degrees Celsius (Centigrade). Degrees Celsius and the equivalent temperature in degrees Fahrenheit are given in the following table.

Degrees Celsius (°C)	Degrees Fahrenheit (°F)	Degrees Celsius (°C)	Degrees Fahrenheit (°F)	Degrees Celsius (°C)	Degrees Fahrenheit (°F)
3.5	38	12.5	54	21.5	71
4.0	39	13.0	55	22.0	72
4.5	40	13.5	56	22.5	72
5.0	41	14.0	57	23.0	73
5.5	42	14.5	58	23.5	74
6.0	43	15.0	59	24.0	75
6.5	44	15.5	60	24.5	76
7.0	45	16.0	61	25.0	77
7.5	45	16.5	62	25.5	78
8.0	46	17.0	63	26.0	79
8.5	47	17.5	63	26.5	80
9.0	48	18.0	64	27.0	81
9.5	49	18.5	65	27.5	81
10.0	50	19.0	66	28.0	82
10.5	51	19.5	67	28.5	83
11.0	52	20.0	68	29.0	84
11.5	53	20.5	69	29.5	85
12.0	54	21.0	70	30.0	86

Particle-Size Distribution Graphs

Particle-size distribution curves were determined by the sieve and hydrometer method from core samples representing two geohydrologic units. The diagrams in table 6 show the percentage of clay, silt, and sand in the samples.

Hydraulic Parameters and Heavy-Mineral Content of Core Samples

Heavy-mineral analyses, hydraulic parameters, and statistical measure of textures from cores of bedrock formations are in tables 7 and 8. These analyses may be useful for correlation of geohydrologic units throughout the Williston basin and surrounding areas.

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TABLE 1.--Records of wells, test holes, and miscellaneous data-collection sites

Owner

BNRR, Burlington Northern Railroad

NDGS 17, North Dakota Geological Survey, test hole number 17

NDSWC 10182, North Dakota State Water Commission, test hole number 10182

USAF, United States Air Force

USBR 55-14, United States Bureau of Reclamation, test hole number 55-14

USDI, United States Department of the Interior

USGS 55-36, United States Geological Survey, test hole number 55-36

Water level (feet)

Water level, in feet below or (+) above land surface

F, flowing
P, pumping
R, recently pumped
S, nearby pumping
Z, other

Use of water

H, domestic
I, irrigation
N, industrial
P, public supply
S, stock
U, unused

Principal aquifer

112, Pleistocene
125, Paleocene
211, Upper Cretaceous

BRDO, buried outwash deposits
BUTT, Butte aquifer
CBKC, Cut Bank Creek aquifer
CNBL, Cannonball Member of Fort Union Formation
DNBH, Denbigh aquifer system
FXHL, Fox Hills Sandstone
HLCK, Hell Creek Formation
KLRH, Karlsruhe aquifer
LKSO, Lake Souris aquifers
MRTN, Martin aquifer
NRKF, New Rockford aquifer system
OTSH, outwash deposits
SORV, Souris Valley aquifer
TGRV, Tongue River Member of Fort Union Formation
VLTRA, Voltaire aquifer

Specific conductance

Value shown is the field specific conductance measured at the well at the time of inventory.

Altitude of land surface (feet)

National Geodetic Vertical Datum of 1929 (NGVD) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

LOCAL NUMBER	OWNER	DEPTH DRILLED (FEET)	DEPTH OF WELL (FEET)	DEPTH TO FIRST OPENING (FEET)	CASING DIAMETER (INCHES)	DATE COMPLETED	WATER LEVEL (FEET)	DATE WATER LEVEL MEASURED	USE OF WATER	PRINCIPAL AQUIFER	SPECIFIC CONDUCTANCE (µMHO/CM AT 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
151-075-02DDD	NDSWC 10182	240	--	--	--	08/09/1978	--	--	U	--	--	--	1605
151-075-03ADA	SCHMEETS, HENRY	--	16	--	48	01/01/1928	10.20	08/16/1955	H	112LKSU	--	--	1560
151-075-03BBB	NDSWC 1086	315	--	--	--	10/24/1955	--	--	U	--	--	--	1611
151-075-04DDD	NDSWC 1057	370	--	--	--	09/02/1955	--	--	U	--	--	--	1614
151-075-05DDD	NDSWC 1058	280	--	--	--	09/06/1955	--	--	U	--	--	--	1616
151-075-07AAA	NDSWC 1059	220	--	--	--	09/09/1955	--	--	U	--	--	--	1597
151-075-07BBB	NDSWC 1060	210	--	--	--	09/12/1955	--	--	U	--	--	--	1617
151-075-15C8A	HASS, ERNEST	228	228	218	4	12/12/1974	110.00	12/12/1974	H,S	211HLCK	1490	7.5	--
151-075-22ADD	ANAMOOSE,ND	--	102	--	4	01/01/1950	--	--	P	112MRTN	880	7.5	1615
151-075-22C	MARTIN, STANLEY	162	140	136	4	08/23/1976	31.00	04/23/1976	H	112MRTN	--	--	1622
151-075-23BCC	ANAMOOSE,ND	253	233	--	--	--	30.00	--	P	211HLCK	1700	7.5	--
151-075-23DD	HORNBACHER, ROBERT	230	182	178	4	05/20/1974	47.00	05/20/1974	H	112MRTN	1800	9.5	1620
151-075-31CCC	NDSWC 10184	200	--	--	--	08/09/1978	--	--	U	--	--	--	1610
151-075-35AAA	NDSWC 10183	240	--	--	--	08/09/1978	--	--	U	--	--	--	1630
151-076-01DC	PAULUS, LAWRENCE	315	306	288	4	12/28/1975	95.00	12/28/1975	S	--	--	--	1622
151-076-02BCC	FARMERS UNION	380	336	315	4	10/27/1976	84.00	10/27/1976	H	--	--	--	--
151-076-02C8C1	NDSWC 1082	70	--	--	--	10/10/1955	--	--	U	--	--	--	1660
151-076-02C8C2	DRAKE,ND	--	127	--	24	01/01/1955	--	--	P	211HLCK	--	--	1680
151-076-02C8C3	DRAKE,ND	--	127	--	4	01/01/1955	--	--	P	211HLCK	--	--	1680
151-076-02CCC	NDSWC 1061	130	--	--	--	09/13/1955	--	--	U	--	--	--	1640
151-076-03AAA	NDSWC 1063	100	--	--	--	09/15/1955	--	--	U	--	--	--	1647
151-076-03DDA	DRAKE,ND	--	180	--	24	01/01/1955	--	--	P	211HLCK	--	--	1680
151-076-04CCC	NDSWC 1069	90	--	--	--	09/19/1955	--	--	U	--	--	--	1596
151-076-04DDD	NDSWC 1068	70	--	--	--	09/19/1955	--	--	U	--	--	--	1604
151-076-07DDC1	NDSWC 4972	550	326	315	2	08/26/1976	9.89	11/17/1976	U	211FXHL	3800	8.0	1590
151-076-07DDC2	NDSWC 4972A	254	254	248	2	08/26/1976	30.05	11/17/1976	U	211FXHL	3000	7.0	1590
151-076-07DDC3	NDSWC 4972B	210	210	204	2	08/27/1976	33.30	10/20/1976	U	211HLCK	2200	7.5	1590
151-076-07DDC4	NDSWC 4972C	128	126	120	1.25	08/27/1976	36.48	10/20/1976	U	211HLCK	2000	7.0	1590
151-076-08ABB	NDSWC 1081	70	--	--	--	10/08/1955	--	--	U	--	--	--	1585
151-076-08BBB	NDSWC 1070	80	80	--	4	09/20/1955	--	--	U	112VLTRA	--	--	1558
151-076-10AAA	KOTH, GERALD	141	117	86	4	11/06/1972	50.00	11/06/1972	H	211HLCK	1550	8.0	1625
151-076-10AAD	COFFMAN, JAMES	242	212	189	4	07/05/1976	18.00	07/05/1976	H	--	--	--	--
151-076-10DDD	NDSWC 1074	120	--	--	--	09/28/1955	--	--	U	--	--	--	1620
151-076-11BBB	NDSWC 1062	110	--	--	--	09/15/1955	--	--	U	--	--	--	1640
151-076-14BCC	NDSWC 1077	70	--	--	--	10/04/1955	--	--	U	--	--	--	1600
151-076-14CCC	NDSWC 1075	90	90	--	4	09/28/1955	--	--	U	--	--	--	1620
151-076-15ADC	NDSWC 8661	105	50	47	1.50	08/25/1966	23.00	09/20/1966	U	112MRTN	--	--	1600
151-076-15DAA	NDSWC 8662	95	55	55	1.50	08/25/1966	--	--	U	112MRTN	--	--	1605
151-076-19ACC	USBR 55-14	40	--	--	--	07/06/1955	10.40	07/08/1955	U	--	--	--	1631
151-076-19CAB	USBR 69-24	50	--	--	--	11/18/1969	4.50	12/05/1969	U	--	--	--	1622

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151-076-19C8C	USBR 55-15	70	--	--	--	07/07/1955	21.70	07/07/1955	U	112MRTN	--	--	1650
151-076-19DAB	USBR 69-23	60	--	--	--	11/18/1969	11.50	12/05/1969	U	112MRTN	--	--	1637
151-076-20BDC	USBR 69-22	50	--	--	--	11/17/1969	8.20	12/05/1969	U	--	--	--	1613
151-076-20DBD	USBR 69-21	50	--	--	--	11/14/1969	10.00	12/05/1969	U	112MRTN	--	--	1611
151-076-23BCC	DRAKE,ND	--	55	--	--	--	10.00	07/16/1975	P	112MRTN	1100	7.0	--
151-076-23CBB	NDSWC 1078	70	--	--	4	10/04/1955	--	--	U	112MRTN	--	--	1600
151-076-24DDD	NDSWC 10185	180	--	--	--	08/09/1978	--	--	U	--	--	--	1620
151-076-26BBB	NDSWC 1076	70	--	--	--	09/30/1955	--	--	U	--	--	--	1623
151-076-28BBB	USBR 55-13	40	--	--	--	07/05/1955	12.20	07/08/1955	U	--	--	--	1614
151-076-28BDB	USBR 69-20	50	--	--	--	11/13/1969	7.10	12/05/1969	U	--	--	--	1612
151-076-28DBC	USBR 69-19	50	--	--	--	11/12/1969	7.10	11/12/1969	U	--	--	--	1613
151-076-29BBB	USAF	100	--	--	--	07/05/1961	19.20	07/05/1961	U	--	--	--	1641
151-076-30BBC	NDSWC 10186	100	--	--	--	08/10/1978	--	--	U	--	--	--	1631
151-076-33AAA	USBR 69-18	50	--	--	--	09/07/1969	5.20	11/19/1969	U	--	--	--	1617
151-076-33AAB	USBR 55-12	40	--	--	--	07/05/1955	6.40	07/08/1955	U	--	--	--	1618
151-076-34ADD	NDSWC 1079	50	--	--	--	10/06/1955	--	--	U	--	--	--	1610
151-076-34BCD	USBR 69-17	50	--	--	--	11/06/1969	5.50	11/19/1969	U	--	--	--	1614
151-076-34DCB	USBR 69-16	50	--	--	--	11/05/1969	14.90	11/19/1969	U	--	--	--	1622
151-076-34DDC	USBR 55-11	40	--	--	--	07/01/1955	11.20	07/05/1955	U	--	--	--	1629
151-077-01BCC	MARTIN, ALFRED	270	270	262	2	03/31/1965	49.00	03/31/1965	H	211FXML	3000	7.5	--
151-077-01DDD	NDSWC 1071	60	--	--	--	09/20/1955	--	--	U	--	--	--	1556
151-077-02AAC	USAF	102	--	--	--	05/11/1961	15.00	05/11/1961	U	--	--	--	1574
151-077-02CCC	NDSWC 1073	70	--	--	--	09/27/1955	--	--	U	--	--	--	1620
151-077-02DDD	NDSWC 1072	60	--	--	--	09/22/1955	--	--	U	--	--	--	1592
151-077-05CBC	USBR 55-20	30	--	--	--	07/12/1955	4.60	07/14/1955	U	--	--	--	1612
151-077-05DCC	USBR 69-33	50	--	--	--	12/05/1969	9.80	12/17/1969	U	--	--	--	1609
151-077-06ACB	USBR 69-34	50	--	--	--	12/09/1969	25.50	12/17/1969	U	--	--	--	1616
151-077-06BBA	USBR 69-35	50	--	--	--	12/09/1969	8.20	12/17/1969	U	--	--	--	1607
151-077-08AAA	USBR 55-19	40	--	--	--	07/11/1955	37.50	07/12/1955	U	--	--	--	1622
151-077-09BBD	USBR 69-32	50	--	--	--	12/05/1969	23.50	12/08/1969	U	--	--	--	1610
151-077-09DBA	USBR 69-31	50	--	--	--	12/04/1969	31.10	12/08/1969	U	--	--	--	1619
151-077-10BBB	NDSWC 10188	60	--	--	--	08/10/1978	--	--	U	--	--	--	1560
151-077-14CBA	USBR 69-28	50	--	--	--	11/21/1969	27.50	12/05/1969	U	--	--	--	1617
151-077-14CDC	USBR 55-17	30	--	--	--	07/08/1955	5.40	07/12/1955	U	--	--	--	1612
151-077-14CDD	USBR 69-27	50	--	--	--	11/20/1969	15.30	11/20/1969	U	--	--	--	1616
151-077-15ACD	USBR 69-29	50	--	--	--	12/03/1969	12.20	12/08/1969	U	--	--	--	1616
151-077-15BAC	USBR 69-30	50	--	--	--	12/03/1969	22.00	12/08/1969	U	--	--	--	1614
151-077-15BBB	USBR 55-18	30	--	--	--	07/11/1955	26.50	07/12/1955	U	--	--	--	1609
151-077-18CCB	USAF	100	--	--	--	04/18/1961	25.00	04/18/1961	U	--	--	--	1643
151-077-23ABD	USBR 69-26	50	--	--	--	11/20/1969	7.20	12/05/1969	U	--	--	--	1613

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151-077-24CBC	USGR 55-16	50	--	--	--	07/08/1955	5.60		07/12/1955	U	--	--	--	1618
151-077-24CDA	USGR 69-25	50	--	--	--	11/19/1969	5.50		12/05/1969	U	--	--	--	1619
151-077-29ADD	SPICHKE, GENE	207	207	189	2	04/16/1965	80.00	P	04/16/1965	H	211MLCK	2500	8.5	1663
151-077-34BDA	KIEF,ND	--	33	--	48	01/01/1955	18.20		08/03/1955	P	125CNBL	--	--	1660
151-077-35BBB	NDSWC 10187	60	--	--	--	08/10/1978	--		--	U	--	--	--	1655
151-078-01AAA	USGR 55-21	30	--	--	--	07/12/1955	5.80		07/14/1955	U	--	--	--	1614
151-078-09BBB	NDSWC 10082	60	--	--	--	11/16/1977	--		--	U	--	--	--	1600
151-078-10ABB	NDSWC 10081	40	--	--	--	11/16/1977	--		--	U	--	--	--	1600
151-078-14AAC	MICHALENKO, ALEC	215	215	197	2	07/13/1965	--		--	S	--	--	--	--
151-078-16CCB	NDSWC 10084	180	79	73	1.25	11/17/1977	1.88		11/29/1977	U	112HUTT	1300	9.0	1610
151-078-17AAA	NDSWC 10083	180	128	125	1.25	11/16/1977	3.79		11/29/1977	U	112BUTT	850	11.0	1600
151-078-21CBB1	NDSWC 10196	240	192	186	1.25	08/11/1978	15.40		09/11/1978	U	112BUTT	1380	9.0	1620
151-078-21CBB2	JOHNSON, WALLACE	76	76	69	4	11/06/1972	16.00		11/06/1972	H	112BUTT	1200	7.5	--
151-078-22DDD	NDSWC 10195	60	--	--	--	08/10/1978	--		--	U	--	--	--	1604
151-078-27DDC	OLSON, GARFIELD	41	41	37	4	10/26/1974	7.00		10/26/1974	S	112BUTT	1300	7.0	--
151-078-28ACB	NDSWC 10217	160	--	--	--	08/17/1978	--		--	U	--	--	--	1630
151-078-29BB	HOWEY, ROBERT	62	--	--	--	11/18/1974		F	--	U	--	--	--	1630
151-078-33DCB	USAF	100	--	--	--	04/18/1961	30.00		04/18/1961	U	--	--	--	1685
151-078-34BCC	OLSON, GARFIELD	36	36	32	4	10/26/1974	17.36		07/21/1975	S	--	--	--	--
151-078-36DDA	NDSWC 10218	60	--	--	--	08/17/1978	--		--	U	--	--	--	1631
151-079-04BBB	NDSWC 10202	120	--	--	--	08/15/1978	--		--	U	--	--	--	1630
151-079-05ADD	NDSWC 10204	60	--	--	--	08/15/1978	--		--	U	--	--	--	1638
151-079-05CBB	USAF	100	--	--	--	04/18/1961	26.00		04/18/1961	U	--	--	--	1654
151-079-08AAA	NDSWC 10203	60	--	--	--	08/15/1978	--		--	U	--	--	--	1665
151-079-12BBB	NDSWC 10197	240	183	177	1.25	08/14/1978	7.85		08/14/1978	U	112BUTT	--	--	1615
151-079-14AAA	NDSWC 10198	80	--	--	--	08/14/1978	--		--	U	--	--	--	1626
151-079-20BBB	NDSWC 10216	120	--	--	--	08/17/1978	--		--	U	--	--	--	1765
151-079-33BBB	USAF	100	--	--	--	04/19/1961	8.00		04/19/1961	U	--	--	--	1824
151-080-02CDD	NDSWC 10213	40	--	--	--	08/16/1978	--		--	U	--	--	--	1760
151-080-04CCB	NDGS 17	49	--	--	--	07/22/1970	--		--	U	--	--	--	1860
151-080-04CCC	NDSWC 10211	120	--	--	--	08/16/1978	--		--	U	--	--	--	1866
151-080-09CCB	USAF	101	--	--	--	04/18/1961	21.00		04/18/1961	U	--	--	--	1930
151-080-17DCC	NDSWC 10212	320	--	--	--	08/16/1978	--		--	U	--	--	--	2013
151-080-24CBC	OLSON, KENNETH	159	159	158	--	05/02/1973	14.00		05/ /1973	H	125TGRV	2700	8.0	--
151-080-25CCC	NDSWC 10214	180	--	--	--	08/16/1978	--		--	U	--	--	--	1925
151-080-25DDC	NDSWC 10215	180	--	--	--	08/17/1978	--		--	U	--	--	--	1885
151-080-32DDD	SCHUENBERG, CECIL	206	206	183	4	04/29/1974	170.00		04/29/1974	H,S	125TGRV	1200	9.0	--
151-080-33CBB	NDGS 18	29	--	--	--	07/22/1970	--		--	U	--	--	--	2150
152-075-04AAA	NDSWC 10181	20	--	--	--	08/09/1978	--		--	U	--	--	--	1545
152-075-07BBB	NDSWC 5001	230	186	180	1.25	09/29/1976	22.30		10/19/1976	U	112NKKF	1550	7.0	1570

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152-075-09DDC	NDSWC 5854	140	93	87	1.25	10/02/1970	33.05	08/18/1975	U	112NRKF	640	8.5	1595
152-075-20AAA	NDSWC 5855	220	--	--	--	10/12/1970	--	--	U	--	--	--	1570
152-075-20CCC	NDSWC 5853	300	263	257	1.25	10/02/1970	32.30	08/18/1975	U	112NRKF	680	8.5	1595
152-075-36A8B1	NDSWC 4971	440	--	--	--	08/24/1976	--	--	U	--	--	--	1580
152-075-36A8B2	NDSWC 4971A	100	95	90	1.25	08/25/1976	12.07	10/20/1976	U	112NRKF	580	7.0	1580
152-076-05CAC	KOBLE, ED	235	235	233	4	10/26/1973	73.00	10/26/1973	H,S	211MLCK	2300	7.5	1595
152-076-07BC	USAF	100	--	--	--	05/19/1961	9.00	05/19/1961	U	--	--	--	1564
152-076-10ACD	BNRR	--	18	--	36	01/01/1942	12.00	08/08/1955	H	112LKSD	--	--	--
152-076-11CCC	NDSWC 1067	150	--	--	--	09/17/1955	--	--	U	--	--	--	1587
152-076-14CCC	NDSWC 1066	80	--	--	--	09/17/1955	--	--	U	--	--	--	1557
152-076-16CBB	NDSWC 10191	60	--	--	--	08/10/1978	--	--	U	--	--	--	1562
152-076-24BDB	STULT, ARNOLD	85	85	79	4	03/29/1973	50.00	03/29/1973	H,S	112NRKF	620	8.5	--
152-076-26BBB	NDSWC 1065	50	--	--	--	09/16/1955	--	--	U	--	--	--	1588
152-076-35BBB	NDSWC 1064	190	--	--	--	09/16/1955	--	--	U	--	--	--	1613
152-076-35CCB	USAF	101	--	--	--	04/21/1961	18.00	04/21/1961	U	--	--	--	1617
152-077-05CC	OUCHSCHERER, MICHAEL	362	362	252	4	08/19/1974	27.00	08/19/1974	S	--	--	--	--
152-077-05DDD	NDSWC 10192	40	--	--	--	08/10/1978	--	--	U	--	--	--	1597
152-077-07CA	ALME, THOMAS	105	105	85	4	03/14/1974	23.00	03/14/1974	H	--	--	--	1560
152-077-11CCD	BURI, CARL	--	350	--	2	01/01/1901	--	--	H	211FXHL	--	--	1600
152-077-19CCA	USAF	101	--	--	--	04/19/1961	12.00	04/19/1961	U	--	--	--	1584
152-077-21CDD	ALME, ARNOLD	--	507	--	2	01/01/1910	150.00	08/23/1955	H	211FXHL	--	--	1620
152-077-25DCC	NDSWC 10190	60	--	--	--	08/10/1978	--	--	U	--	--	--	1550
152-077-26BCC	NDSWC 10189	20	--	--	--	08/10/1978	--	--	U	--	--	--	1571
152-077-28CAC	GANGE, WILLIAM	342	317	296	4	07/09/1976	90.00	07/09/1976	H	211FXHL	--	--	--
152-077-28CD	BUDEAU, EDWARD	290	290	--	2	09/26/1964	50.00	09/26/1964	U	211FXHL	--	--	--
152-077-30DDA1	NDSWC 4973	620	410	399	2	08/30/1976	39.84	10/20/1976	U	211FXHL	4200	8.0	1610
152-077-30DDA2	NDSWC 4973A	330	330	324	2	08/31/1976	45.65	10/20/1976	U	211FXHL	4500	7.0	1610
152-077-30DDA3	NDSWC 4973B	240	240	235	1.25	09/01/1976	43.08	10/20/1976	U	211MLCK	3200	7.5	1610
152-078-05DDA	USAF	102	--	--	--	05/20/1961	15.00	05/20/1961	U	--	--	--	1592
152-078-06ACA	USBR 69-53	35	--	--	--	12/17/1969	19.70	01/06/1970	U	--	--	--	1574
152-078-06DDA	USBR 69-52	35	--	--	--	12/16/1969	16.00	01/06/1970	U	--	--	--	1581
152-078-08BAC	USBR 69-50	40	--	--	--	12/12/1969	6.30	01/06/1970	U	--	--	--	1571
152-078-08BBA	USBR 69-51	45	--	--	--	12/16/1969	9.00	12/16/1969	U	--	--	--	1592
152-078-08CAC	USBR 70-3	75	--	--	--	01/13/1970	3.00	01/14/1970	U	--	--	--	1567
152-078-08CDB	USBR 69-1	50	--	--	--	12/11/1969	1.50	12/11/1969	U	--	--	--	1565
152-078-16C8A	NDSWC 10079	80	41	38	1.25	11/16/1977	4.39	11/29/1977	U	112VLTRA	3100	9.0	1560
152-078-17ACD	USBR 70-48	50	--	--	--	03/04/1970	26.80	03/13/1970	U	--	--	--	1615
152-078-17BAB	USBR 70-49A	65	--	--	--	01/22/1970	--	--	U	--	--	--	1566
152-078-17BAD	USBR 70-49	50	--	--	--	01/16/1970	7.90	01/16/1970	U	--	--	--	1568
152-078-17DAD	USBR 69-47	50	--	--	--	12/19/1969	14.40	03/13/1970	U	--	--	--	1603

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152-078-19BCC	USBR 55-28	50	--	--	--	07/15/1955	8.30	07/18/1955	U	--	--	--	1603
152-078-19CDD	USBR 55-27	50	--	--	--	07/15/1955	5.70	07/18/1955	U	--	--	--	1606
152-078-21ACC	USBR 69-45	50	--	--	--	12/18/1969	27.30	03/13/1970	U	--	--	--	1614
152-078-21CCA	USBR 69-46	50	--	--	--	12/18/1969	19.80	03/13/1970	U	--	--	--	1608
152-078-21DDB	USBR 69-44	50	--	--	--	12/17/1969	20.50	03/13/1970	U	--	--	--	1610
152-078-26BBB	NDSWC 10194	60	--	--	--	08/10/1978	--	--	U	--	--	--	1574
152-078-26CAD	USBR 69-40	50	--	--	--	12/12/1969	11.90	12/17/1969	U	--	--	--	1608
152-078-26CBB	USBR 69-41	50	--	--	--	12/15/1969	18.00	03/08/1970	U	--	--	--	1608
152-078-27ACC	USBR 69-42	50	--	--	--	12/16/1969	4.80	03/13/1970	U	--	--	--	1588
152-078-27BAC	USBR 69-43	50	--	--	--	12/16/1969	9.50	04/10/1970	U	--	--	--	1606
152-078-27DAD	USBR 70-41A	50	--	--	--	02/26/1970	18.00	03/02/1970	U	--	--	--	1626
152-078-28CCC	USBR 55-25	50	--	--	--	07/14/1955	11.90	07/18/1955	U	--	--	--	1608
152-078-29CCB	USBR 55-26	50	--	--	--	07/14/1955	4.80	07/18/1955	U	--	--	--	1608
152-078-33AAA	USBR 55-24	30	--	--	--	07/13/1955	12.40	07/14/1955	U	--	--	--	1610
152-078-33CCC	NDSWC 10080	60	--	--	--	11/16/1977	--	--	U	--	--	--	1615
152-078-35AAA	USBR 55-23	50	--	--	--	07/14/1955	4.10	07/14/1955	U	--	--	--	1597
152-078-35AAB	USBR 69-39	50	--	--	--	12/11/1969	17.00	12/17/1969	U	--	--	--	1615
152-078-36BCB	USBR 69-38	55	--	--	--	12/11/1969	35.20	12/17/1969	U	--	--	--	1635
152-078-36CAA	USBR 69-37	50	--	--	--	12/10/1969	7.90	12/17/1969	U	--	--	--	1606
152-078-36DDB	USBR 69-36	50	--	--	--	12/10/1969	9.70	12/17/1969	U	--	--	--	1611
152-079-02AAA	USBR 55-33	40	--	--	--	07/20/1955	1.50	07/22/1955	U	--	--	--	1566
152-079-02CDD	USBR 55-32	40	--	--	--	07/19/1955	5.80	07/20/1955	U	--	--	--	1576
152-079-03DDD	NDSWC 10077	47	--	--	--	11/15/1977	--	--	U	--	--	--	1575
152-079-05BCB	NDSWC 10073	60	--	--	--	11/15/1977	--	--	U	--	--	--	1585
152-079-05CBB	NDSWC 10074	40	--	--	--	11/15/1977	--	--	U	--	--	--	1578
152-079-08BCC	NDSWC 10075	70	45	42	1.25	11/15/1977	12.03	11/29/1977	U	112VLTRA	1000	9.0	1588
152-079-11BCC	NDSWC 10076	40	--	--	--	11/15/1977	--	--	U	--	--	--	1590
152-079-11BCD	USBR 55-31	30	--	--	--	07/19/1955	6.80	07/22/1955	U	--	--	--	1576
152-079-13DDD1	NDSWC 4974	640	457	446	2	09/01/1976	3.33	10/21/1976	U	211FXHL	4330	8.8	1605
152-079-13DDD2	NDSWC 4974A	130	130	125	1.25	09/02/1976	13.21	10/20/1976	U	211HLCK	3000	8.0	1605
152-079-13DDD3	NDSWC 4974B	312	312	306	2	09/03/1976	11.25	10/21/1976	U	211HLCK	4000	8.0	1605
152-079-14ABB	USBR 55-30	35	--	--	--	07/18/1955	--	--	U	--	--	--	1613
152-079-14DAD	USBR 55-29	30	--	--	--	07/18/1955	7.40	07/18/1955	U	--	--	--	1601
152-079-18BBB	USAF	100	--	--	--	04/18/1961	19.00	04/18/1961	U	--	--	--	1577
152-079-21DDD	NDSWC 10200	140	--	--	--	08/14/1978	--	--	U	--	--	--	1617
152-079-29AAA	NDSWC 10206	100	--	--	--	08/15/1978	--	--	U	--	--	--	1612
152-079-32AAA	NDSWC 10201	80	--	--	--	08/15/1978	--	--	U	--	--	--	1633
152-079-33BCC	NDSWC 10205	60	--	--	--	08/15/1978	--	--	U	--	--	--	1642
152-079-35DDD	NDSWC 10199	140	--	--	--	08/14/1978	--	--	U	--	--	--	1604
152-080-05DAA	BECHTOLD, ELMER	215	215	200	5	07/18/1972	60.00	07/18/1972	H,S	211HLCK	2500	12.5	1685

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152-080-05DDA	NDGS 16	54	--	--	--	07/22/1970	--	--	U	--	--	--	1667
152-080-09CCC	NDSWC 10210	120	--	--	--	08/15/1978	--	--	U	--	--	--	1652
152-080-12CCC	NDSWC 10209	80	--	--	--	08/15/1978	--	--	U	--	--	--	1600
152-080-15AAA	NDSWC 10208	60	--	--	--	08/15/1978	--	--	U	--	--	--	1618
152-080-24CCC	NDSWC 10207	60	--	--	--	08/15/1978	--	--	U	--	--	--	1650
152-080-29AAD	NURNBERG, ALMA	123	123	103	--	04/23/1973	45.00	04/23/1973	H,S	125TGRV	2200	7.5	--
153-075-07CAC	NDSWC 4996	160	--	--	--	09/27/1976	--	--	U	--	--	--	1525
153-075-08BBB	NDSWC 4995	100	--	--	--	09/27/1976	--	--	U	--	--	--	1530
153-075-18C	DIETERLE, WAYNE	402	388	367	4	08/11/1976	64.00	08/11/1976	S	--	--	--	--
153-075-31DCC	SENECHAL, MARVIN	46	46	42	4	09/04/1972	9.00	09/04/1972	H	112LKSU	1100	8.0	--
153-076-03DDD	NDSWC 9549	120	41	38	1.25	05/12/1976	2.80	06/24/1976	U	112LKSU	460	8.5	1542
153-076-05DDD	NDSWC 5850	360	263	257	1.25	10/01/1970	4.70	08/11/1975	U	112NRKF	1750	8.0	1540
153-076-08DCD	NDSWC 5849	280	163	157	1.25	09/30/1970	18.08	08/11/1975	U	112NRKF	480	7.5	1555
153-076-10DDC	LEMER, GEORGE	190	190	186	4	01/02/1973	40.00	01/02/1973	S,H	112NRKF	1350	8.0	--
153-076-12DDD1	NDSWC 4997	220	172	166	2	09/28/1976	1.01	10/19/1976	U	112NRKF	650	8.0	1540
153-076-12DDD2	NDSWC 4997A	50	50	44	1.25	09/28/1976	8.69	10/19/1976	U	112LKSU	520	7.5	1540
153-076-13DDD	NDSWC 4998	280	124	118	1.25	09/28/1976	9.70	10/19/1976	U	112NRKF	2000	7.5	1560
153-076-20AAA	NDSWC 5852	200	--	--	--	10/01/1970	--	--	U	--	--	--	1570
153-076-25AAA1	NDSWC 4999	460	198	192	1.25	09/28/1976	12.83	10/19/1976	U	112NRKF	1400	7.5	1560
153-076-25AAA2	NDSWC 4999A	60	--	--	--	09/29/1976	--	--	U	--	--	--	1560
153-076-36ABA	NDSWC 5000	100	--	--	--	09/29/1976	--	--	U	--	--	--	1570
153-077-02ADD	NDSWC 5305	180	156	150	1.25	05/22/1978	23.90	11/11/1978	U	112NRKF	1050	9.0	1550
153-077-02CCC	NDSWC 9396	240	204	198	1.25	08/11/1975	10.49	08/18/1975	U	112NRKF	780	9.0	1540
153-077-03CBB	NDSWC 5307	80	--	--	--	05/23/1978	--	--	U	--	--	--	1550
153-077-04AAA	NDSWC 9537	200	--	--	--	05/06/1976	--	--	U	--	--	--	1530
153-077-04BCC	NDSWC 9535	80	--	--	--	05/05/1976	--	--	U	--	--	--	1538
153-077-05AAA	USBR 70-12	50	--	--	--	08/21/1970	11.70	08/21/1970	U	--	--	--	1536
153-077-05DCC	NDSWC 5308	40	--	--	--	05/23/1978	--	--	U	--	--	--	1540
153-077-05DDA	NDSWC 9533	60	--	--	--	05/05/1976	--	--	U	--	--	--	1535
153-077-06AAA	USBR 70-11	50	--	--	--	08/20/1970	3.00	08/27/1970	U	--	--	--	1533
153-077-07BDC1	KARLSRUHE,ND	--	45	--	--	05/ /1970	5.16	07/10/1975	P	112KLRH	789	6.0	--
153-077-07BDC2	KARLSRUHE,ND	60	58	42	8	11/24/1973	7.00	11/24/1973	P	112KLRH	810	7.5	--
153-077-08DDD	NDSWC 9534	100	--	--	--	05/05/1976	--	--	U	--	--	--	1540
153-077-10ACA	DUCHSCHEREN, JOHN	98	98	95	4	05/07/1975	20.00	05/07/1975	H	--	--	--	--
153-077-11CCC	NDSWC 9532	80	--	--	--	05/04/1976	--	--	U	--	--	--	1550
153-077-15ADD	VOELLER, THEODORE	128	119	99	4	09/18/1973	45.00	09/18/1973	H	211MLCK	2400	9.0	1565
153-077-23BCC	NDSWC 9531	80	--	--	--	05/04/1976	--	--	U	--	--	--	1560
153-077-29AAA	NDSWC 10193	60	--	--	--	08/10/1978	--	--	U	--	--	--	1542
153-077-32ABA	USAF	100	--	--	--	04/18/1961	13.00	04/18/1961	U	--	--	--	1578
153-077-34ACD	ROE, PAUL	325	325	297	2	07/01/1967	85.00	07/01/1967	S	211FXML	4000	8.5	1580

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153-077-34BA	STROMME, CARL	324	317	296	4	05/26/1975	27.00	05/26/1975	H	--	--	--	--
153-077-35BBB	NDSWC 9530	80	--	--	--	05/04/1976	--	--	U	--	--	--	1545
153-078-01ADD	USAF	100	--	--	--	07/10/1961	15.00	07/10/1961	U	--	--	--	1555
153-078-01BBB	USBR 70-9	50	--	--	--	08/18/1970	11.40	08/27/1970	U	--	--	--	1547
153-078-02BAA	KRAFT, PATRICK	80	--	--	--	05/19/1975	--	--	U	--	--	--	1552
153-078-02CAA	MERCK, ANTON	--	50	--	--	--	15.18	07/26/1977	I	112KLRH	1500	9.5	--
153-078-02CBD	MERCK, ANTON	120	--	--	--	05/26/1975	--	--	U	--	--	--	--
153-078-02CDC	MERCK, ANTON	75	--	--	--	05/26/1975	--	--	U	--	--	--	--
153-078-03BAA1	MERCK, ANTON	50	50	30	12	10/11/1976	9.00	10/11/1976	I	--	--	--	--
153-078-03BAA2	MERCK, ANTON	42	--	--	--	05/26/1975	--	--	U	--	--	--	--
153-078-03BAA3	MERCK, ANTON	50	--	--	4	10/10/1976		S --	U	--	--	--	--
153-078-04BCC	NDSWC 5847	60	--	--	--	09/29/1970	--	--	U	--	--	--	1580
153-078-05BBB	USBR 70-101	51	--	--	--	08/04/1970	5.60	08/07/1970	U	--	--	--	1582
153-078-05DDD	NDSWC 5841	80	--	--	--	09/29/1970	--	--	U	--	--	--	1605
153-078-06ACB	USBR 70-2	50	--	--	--	07/31/1970	5.20	08/07/1970	U	--	--	--	1591
153-078-08DDD	NDSWC 5844	60	--	--	--	09/29/1970	--	--	U	--	--	--	1605
153-078-11BBA	NDSWC 9557	40	--	--	--	05/19/1976	--	--	U	--	--	--	1540
153-078-13DDD	NDSWC 9556	40	--	--	--	05/19/1976	--	--	U	--	--	--	1545
153-078-18DAA	USAF	101	--	--	--	04/20/1961	15.00	04/20/1961	U	--	--	--	1612
153-078-19CBB	USBR 70-60	35	--	--	--	01/28/1970	10.50	03/12/1970	U	--	--	--	1569
153-078-19CDD	USGS 55-36	30	--	--	--	07/21/1955	11.00	07/22/1955	U	--	--	--	1574
153-078-22BAB	ZABACK, JAMES	110	--	--	--	10/18/1974	--	--	U	--	--	--	1610
153-078-29AAA	NDSWC 5845	80	--	--	--	09/29/1970	--	--	U	--	--	--	1620
153-078-29CDB	USBR 70-57	35	--	--	--	01/27/1970	6.20	03/09/1970	U	--	--	--	1570
153-078-30ABD	USBR 70-59	35	--	--	--	01/28/1970	12.60	03/09/1970	U	--	--	--	1572
153-078-30BBB	NDSWC 10078	40	--	--	--	11/16/1977	--	--	U	--	--	--	1560
153-078-30BCC	USBR 55-35	30	--	--	--	07/21/1955	9.50	07/22/1955	U	--	--	--	1571
153-078-30DAD	USBR 70-58	35	--	--	--	01/27/1970	9.00	03/09/1970	U	--	--	--	1569
153-078-31BBB	USBR 55-34	30	--	--	--	07/20/1955	7.70	07/21/1955	U	--	--	--	1572
153-078-32ABD	USBR 70-56	50	--	--	--	01/23/1970	3.20	03/12/1970	U	--	--	--	1568
153-078-32DAA	USBR 70-55	35	--	--	--	01/06/1970	8.50	03/09/1970	U	--	--	--	1574
153-078-33BCB	NDSWC 5846	40	--	--	--	09/29/1970	--	--	U	--	--	--	1578
153-078-33CCD	USBR 69-54	35	--	--	--	12/18/1969	15.00	01/06/1970	U	--	--	--	1576
153-078-36DDD	NDSWC 9529	100	--	--	--	05/04/1976	--	--	U	--	--	--	1644
153-079-01ADD	USBR 70-1	50	--	--	--	06/28/1970	4.80	08/07/1970	U	--	--	--	1584
153-079-01BCC	USBR 70-67	35	--	--	--	01/28/1970	5.60	03/09/1970	U	--	--	--	1583
153-079-01CDC	USBR 55-40	55	--	--	--	07/26/1955	8.30	07/27/1955	U	--	--	--	1590
153-079-02BAC	FEIST, RICHARD	90	90	50	4	10/22/1974	20.00	10/22/1974	H	--	--	--	--
153-079-06DDD	NDSWC 10071	40	--	--	--	11/15/1977	--	--	U	--	--	--	1515
153-079-07ABB	HUWE, DONALD	245	--	--	--	08/20/1976	--	--	U	--	--	--	--

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153-079-08BCC	NDSWC 10072	140	--	--	--	11/15/1977	--	--	U	--	--	--	1495
153-079-10D	THOM, JAMES	62	--	--	--	02/14/1976	--	--	U	--	--	--	1575
153-079-11DDD	USBR 55-39	45	--	--	--	07/25/1955	7.80	07/29/1955	U	--	--	--	1588
153-079-12BBB	USBR 70-66	45	--	--	--	01/29/1970	--	--	U	--	--	--	1595
153-079-12BCC	USBR 70-65	55	--	--	--	01/29/1970	10.20	03/12/1970	U	--	--	--	1606
153-079-13BBB	USBR 70-64	45	--	--	--	02/05/1970	9.70	03/12/1970	U	--	--	--	1593
153-079-13BDC	USBR 70-63	45	--	--	--	02/05/1970	17.20	03/09/1970	U	--	--	--	1592
153-079-13CDD	USBR 70-62	35	--	--	--	02/06/1970	11.70	03/09/1970	U	--	--	--	1572
153-079-13DCC	USBR 55-38	33	--	--	--	07/25/1955	12.80	07/25/1955	U	--	--	--	1590
153-079-16BCB	USAF	101	--	--	--	05/21/1961	18.00	05/21/1961	U	--	--	--	1616
153-079-24ADD	USBR 55-37	30	--	--	--	07/22/1955	2.10	07/29/1955	U	--	--	--	1582
153-079-30AAA1	NDSWC 4975	720	467	456	2	09/03/1976	39.20	11/15/1976	U	211FXHL	4800	8.5	1595
153-079-30AAA2	NDSWC 4975A	410	410	404	2	09/08/1976	27.92	10/26/1976	U	211HLCK	4000	7.0	1595
153-079-30AAA3	NDSWC 4975B	120	120	114	1.25	09/08/1976	63.40	10/27/1976	U	125CNBL	1400	7.0	1595
153-079-31CAB	BASIN ELEC.	72	70	--	48	11/ /1950	6.35	07/15/1975	N	112VLTRA	990	7.5	1570
153-079-31CAC	BASIN ELEC.	67	67	--	--	1950	7.40	07/15/1975	N	112VLTRA	1100	7.0	1572
153-079-31CBB	BASIN ELEC.	60	56	--	48	11/ /1950	7.59	07/15/1975	N	112VLTRA	1600	8.0	1567
153-080-02BBB	NDSWC 1386	84	--	--	--	09/12/1958	--	--	U	--	--	--	1605
153-080-03CBB	NDGS 14	49	--	--	--	07/21/1970	--	--	U	--	--	--	1648
153-080-03DDD1	NDGS 15	49	--	--	--	07/21/1970	--	--	U	--	--	--	1615
153-080-03DDD2	NDSWC 5834	100	--	--	--	09/24/1970	--	--	U	--	--	--	1615
153-080-05CCC	NDSWC 5838	80	--	--	--	09/25/1970	--	--	U	--	--	--	1605
153-080-14BBA	NDSWC 5835	120	93	87	1.25	09/25/1970	63.21	08/14/1975	U	112BKDU	2200	8.5	1635
153-080-14CBB	NDSWC 5836	100	--	--	--	09/25/1970	--	--	U	--	--	--	1610
153-080-15CDC	SWEDLUND, PAUL	--	175	--	--	02/19/1969	102.00	02/19/1969	H,S	--	--	--	--
153-080-22AAD	NDSWC 1382	44	--	--	--	09/10/1958	--	--	U	--	--	--	1510
153-080-22CDB	HUSEBY, LONNIE	128	128	120	4	05/15/1972	40.00	05/15/1972	H	211HLCK	2500	9.5	--
153-080-25BCD	VELVA,ND	--	60	--	--	--	--	--	P	112VLTRA	610	9.5	--
153-080-25CDC	KRUMWIEDE, BILL	150	150	120	4	09/22/1973	--	--	H	125CNBL	710	9.5	--
153-080-27DDA	USAF	100	--	--	--	04/21/1961	14.00	04/21/1961	U	--	--	--	1653
153-080-36AAC1	WATER USERS, N P	102	101	61	8	03/10/1973	25.30	03/10/1973	U	112VLTRA	--	--	--
153-080-36AAC2	WATER USERS, N P	102	101	61	10	06/08/1973	24.60	06/08/1973	P	112VLTRA	840	--	--
153-080-36AAC3	WATER USERS, N P	102	102	90	5	02/15/1973	25.00	02/15/1973	P	112VLTRA	--	--	--
153-080-36AB	WATER USERS, N P	75	--	--	--	02/09/1973	--	--	U	--	--	--	--
154-075-04AAA1	NDSWC 4991	180	108	102	2	09/24/1976	6.27	11/02/1976	U	211FXHL	2700	7.5	1508
154-075-04AAA2	NDSWC 4991A	40	34	28	1.25	09/24/1976	5.90	11/02/1976	U	112LKSD	425	7.0	1508
154-075-16AAA	NDSWC 4992	120	--	--	--	09/24/1976	--	--	U	--	--	--	1512
154-075-21CDD1	NDSWC 4993	320	197	187	2	09/24/1976	13.65	10/19/1976	U	211FXHL	1300	8.0	1550
154-075-21CDD2	NDSWC 4993A	110	110	104	1.25	09/27/1976	6.50	10/20/1976	U	211FXHL	700	6.5	1550
154-075-23DDA	NDSWC 10180	160	--	--	--	08/08/1978	--	--	U	--	--	--	1540

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154-075-30DDD	NDSWC 4994	100	80	74	1.25	09/27/1976	15.64	10/19/1976	U	112BRDD	500	7.5	1550
154-076-04CCC	NDSWC 10028	100	36	30	1.25	10/27/1977	4.08	10/05/1978	U	112LKSD	1120	10.0	1505
154-076-05DAA	NDGS 4	44	--	--	--	07/16/1970	--	--	U	--	--	--	1507
154-076-16CCC	NDSWC 10027	100	--	--	--	10/27/1977	--	--	U	--	--	--	1517
154-076-21CCC	NDSWC 9548	80	39	33	1.25	05/12/1976	7.82	10/03/1978	U	112LKSD	870	8.0	1526
154-076-30AAA	NDSWC 9547	120	--	--	--	05/12/1976	--	--	U,N	--	--	--	1530
154-076-30CBB	NDSWC 9546	80	--	--	--	05/12/1976	--	--	U	--	--	--	1530
154-076-31BCC	NDSWC 9394	60	--	--	--	08/07/1975	--	--	U	--	--	--	1535
154-076-33CCC	NDSWC 5451	60	--	--	--	10/01/1970	--	--	U	--	--	--	1535
154-077-02CCC	NDSWC 9543	80	--	--	--	05/11/1976	--	--	U	--	--	--	1500
154-077-03ABC	HEIT, EDWARD	100	--	--	--	08/18/1976	--	--	U	--	--	--	--
154-077-03ABD	HEIT, EDWARD	41	--	--	--	08/18/1976	--	--	U	--	--	--	--
154-077-06DCB	MARKUSEN BROS.	53	53	38	4	12/18/1972	25.00	12/18/1972	S	112SORV	2200	6.0	--
154-077-07DDD	NDSWC 9553	100	95	92	1.25	05/17/1976	52.88	06/22/1976	U	112NRKF	--	--	1615
154-077-12CCD	NDSWC 5304	60	--	--	--	05/22/1978	--	--	U	--	--	--	1500
154-077-15DDD	NDSWC 9542	80	--	--	--	05/11/1976	--	--	U	--	--	--	1535
154-077-17CCC	NDSWC 9552	280	143	137	1.25	05/17/1976	51.28	05/19/1976	U	112NRKF	780	8.0	1585
154-077-18CCC	NDSWC 9554	260	178	173	4	05/18/1976	53.07	05/20/1976	U	112NRKF	590	8.0	1575
154-077-21DCC	NDSWC 10364	240	203	200	1.25	11/01/1978	13.02	11/07/1978	U	112NRKF	1150	8.0	1535
154-077-22CBC	NDSWC 10362	160	--	--	--	11/01/1978	--	--	U	--	--	--	1540
154-077-22CCC	NDSWC 10363	250	235	230	1.25	11/01/1978	14.52	11/07/1978	U	112NRKF	1530	8.5	1535
154-077-25CDB	NDSWC 9545	100	--	--	--	05/12/1976	--	--	U	--	--	--	1540
154-077-26DAD	NDSWC 9544	100	--	--	--	05/12/1976	--	--	U	--	--	--	1540
154-077-27ADD	NDSWC 9538	120	84	78	1.25	05/07/1976	13.63	05/11/1976	U	112NRKF	470	9.0	1535
154-077-27CDD	NDSWC 9390	240	204	198	1.25	08/06/1975	12.02	10/04/1978	U	112NRKF	1100	8.0	1533
154-077-27DBB	NDSWC 9539	240	198	192	1.25	05/10/1976	1.54	05/13/1976	U	112NRKF	1720	9.0	1520
154-077-28AAC	BUEHM, JOE	224	223	193	1.50	07/16/1976	10.00	07/16/1976	U	112NRKF	--	--	--
154-077-28ABD	BOEHM, JOE	218	215	195	12	05/21/1977	16.00	05/22/1977	I	112NRKF	980	9.0	--
154-077-28ACC	NDSWC 9541	240	--	--	--	05/11/1976	--	--	U	--	--	--	1540
154-077-28ADB1	NDSWC 10365	230	203	200	1.25	11/02/1978	17.37	11/07/1978	U	112NRKF	975	8.5	1540
154-077-28ADB2	NDSWC 10367	220	203	200	1.25	11/02/1978	15.94	11/07/1978	U	112NRKF	1100	8.8	1540
154-077-28ADD1	NDSWC 9540	260	180	177	1.25	05/11/1976	14.84	05/20/1976	U	112NRKF	980	9.0	1539
154-077-28ADD2	NDSWC 10366	240	203	200	1.25	11/02/1978	20.07	11/07/1978	U	112NRKF	1050	8.5	1540
154-077-29ADA	NDSWC 10368	208	203	200	1.25	11/02/1978	23.75	11/07/1978	U	112NRKF	425	8.5	1545
154-077-29BBB	NDSWC 9551	260	208	202	1.25	05/13/1976	24.71	05/19/1976	U	112NRKF	420	9.0	1548
154-077-29CCC	NDSWC 9368	180	151	148	1.25	08/06/1975	16.02	08/12/1975	U	112NRKF	1900	8.0	1540
154-077-30ADD	NDSWC 9550	120	--	--	--	05/13/1976	--	--	U	--	--	--	1545
154-077-30CAC	USGR 547	63	--	--	--	10/09/1974	16.80	09/10/1975	U	--	--	--	1551
154-077-30CBB	USGR 513	78	30	--	2	04/14/1971	20.39	09/10/1975	U	--	--	--	--
154-077-30CBC	TOMPKINS, LONNIE	180	--	--	--	06/19/1969	--	--	U	--	--	--	--

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154-077-30CDA	TOMPKINS, LONNIE	134	--	--	--	10/16/1974	--		--	U	--	--	--	--
154-077-30CDB1	TOMPKINS, LONNIE	162	162	142	16	07/ /1974	26.83	P	07/09/1975	I	112NRKF	390	8.5	--
154-077-30CDB2	TOMPKINS, LONNIE	203	194	174	12	04/11/1977	20.00		07/26/1977	I	112NRKF	410	9.0	--
154-077-30CDD	TOMPKINS, LONNIE	180	--	--	--	10/16/1974	--		--	U	--	--	--	--
154-077-30DAC1	TOMPKINS, LONNIE	58	48	28	16	10/17/1974	11.00		10/17/1974	I	--	--	--	--
154-077-30DAC2	TOMPKINS, LONNIE	56	54	34	12	10/18/1976	3.00		10/18/1976	I	--	--	--	--
154-077-30DBD	NDSWC T-1	120	--	--	--	02/19/1977	--		--	U	--	--	--	--
154-077-30DCA	TOMPKINS, LONNIE	142	--	--	--	10/10/1974	--		--	U	--	--	--	--
154-077-30DC81	TOMPKINS, LONNIE	179	--	--	--	10/10/1974	--		--	U	--	--	--	--
154-077-30DC82	NDSWC T-2	120	--	--	--	02/19/1977	--		--	U	--	--	--	--
154-077-30DCC	USBR 762	140	--	--	--	08/27/1971	18.70		08/27/1971	U	--	--	--	1548
154-077-30DDC	USBR 548	63	--	--	2	10/09/1974	12.11		09/10/1975	U	--	--	--	1544
154-077-31ADB	ZABACK, JAMES	220	--	--	--	08/17/1976	--		--	U	--	--	--	--
154-077-31ADC	ZABACK, JAMES	160	--	--	--	08/17/1976	--		--	U	--	--	--	--
154-077-31ADD	ZABACK, JAMES	160	--	--	--	08/17/1976	--		--	U	--	--	--	1545
154-077-32AAD	NDSWC 5311	180	--	--	--	05/23/1978	--		--	U	--	--	--	1536
154-077-32ADD1	USBR 70-13	50	--	--	--	08/20/1970	6.50		08/27/1970	U	--	--	--	1532
154-077-32ADD2	NDSWC 5310	180	--	--	--	05/23/1978	--		--	U	--	--	--	1528
154-077-32CCA	USBR 540	63	--	--	--	05/16/1973	--		--	U	--	--	--	1548
154-077-32CDB	USBR 763	130	100	60	16	09/01/1971	14.20		09/01/1971	I	--	--	--	1544
154-077-32CDC	USBR 73-1	50	--	--	--	05/22/1973	15.00		05/30/1973	U	--	--	--	1544
154-077-32DAD	NDSWC 9536	170	137	134	1.25	05/05/1976	7.86		05/20/1976	U	112NRKF	1100	--	1535
154-077-32DCC	USBR 539	48	40	--	2	05/15/1973	13.79		09/09/1975	--	--	--	--	1545
154-077-32DDD	NDSWC 5309	140	--	--	--	05/23/1978	--		--	U	--	--	--	1540
154-077-33BBB	NDSWC 9389	80	--	--	--	08/06/1975	--		--	U	--	--	--	1536
154-077-34BCC	USBR 70-103	51	--	--	--	08/25/1970	8.80		08/25/1970	U	--	--	--	1525
154-077-34DAD	USBR 70-104	51	--	--	--	08/26/1970	4.40		09/03/1970	U	--	--	--	1532
154-077-35BAB	USBR	78	61	55	1.25	04/08/1976	12.13		04/12/1976	U	211FXHL	--	--	1545
154-077-35BBB1	MEYER, LAWRENCE	62	--	--	--	10/17/1974	--		--	U	--	--	--	--
154-077-35BBB2	NDSWC 9391	200	174	168	1.25	08/07/1975	8.95		08/12/1975	U	112NRKF	600	8.5	1536
154-077-35BCA1	NDSWC 9392	180	144	138	1.25	08/07/1975	16.21		08/11/1975	U	112NRKF	530	8.5	1542
154-077-35BCA2	MEYER, LAWRENCE	--	148	138	12	1975	18.00		--	I	112NRKF	520	9.0	--
154-077-35BCA3	NDSWC A-H	123	123	117	1.25	04/08/1976	18.10		04/13/1976	U	112NRKF	--	--	1540
154-077-35BCC	MEYER, LAWRENCE	96	--	--	--	10/17/1974	--		--	U	--	--	--	--
154-077-35BCD	MEYER, LAWRENCE	82	--	--	--	10/17/1974	--		--	U	--	--	--	--
154-077-35BDC	MEYER, LAWRENCE	42	--	--	--	10/17/1974	--		--	U	--	--	--	--
154-077-35BDD	NDSWC 9393	120	80	77	1.25	08/07/1975	15.43		08/11/1975	U	112NRKF	430	8.5	1537
154-077-35CCC	NDSWC 9395	260	--	--	--	08/11/1975	--		--	U	--	--	--	1555
154-077-36C8C	NDSWC 5306	80	--	--	--	05/23/1978	--		--	U	--	--	--	1536
154-078-02BBC	NDSWC 10064	75	--	--	--	11/09/1977	--		--	U	--	--	--	1508

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154-078-03DDD	NDSWC 10061	60	--	--	--	11/08/1977	--		--	U	--	--	--	1500
154-078-05DDC	NDSWC 10065	60	--	--	--	11/09/1977	--		--	U	--	--	--	1492
154-078-07BBC	SEVLAND, CLAUS	172	171	171	4	03/29/1974	38.00		03/29/1974	H,S	112BRDU	540	8.5	--
154-078-10ADD	NDSWC 10062	100	88	85	1.25	11/09/1977	7.58		04/26/1978	U	112SORV	2250	9.0	1475
154-078-14CCC	NDSWC 9385	120	61	58	1.25	08/05/1975	4.18		08/13/1975	U	112NRKF	650	8.0	1525
154-078-15AAA	NDSWC 10063	80	--	--	--	11/09/1977	--		--	U	--	--	--	1474
154-078-18BAA	NDSWC 5318	140	--	--	--	05/25/1978	--		--	U	--	--	--	1530
154-078-19DCD	NDSWC 5317	105	93	90	1.25	05/24/1978		F	05/25/1978	U	112NRKF	1590	9.5	1485
154-078-20ABC	NDSWC 5316	80	--	--	--	05/24/1978	--		--	U	--	--	--	1480
154-078-20CAD	NDSWC 5315	40	--	--	--	05/24/1978	--		--	U	--	--	--	1482
154-078-20CCC	NDSWC 5313	62	57	54	1.25	05/24/1978	1.75		05/24/1978	U	112SORV	590	9.0	1484
154-078-24CCC	NDSWC 9555	320	224	218	1.25	05/19/1976	68.03		05/20/1976	U	112NRKF	380	8.5	1590
154-078-25BAA	ABERLE, JOSEPH	120	--	--	--	06/17/1975	--		--	U	--	--	--	1460
154-078-25BAB	ABERLE, JOSEPH	100	--	--	--	06/17/1975	--		--	U	--	--	--	--
154-078-25CB	ABERLE, JOSEPH	140	--	--	--	06/25/1975	9.00		06/25/1975	U	--	--	--	--
154-078-25CBB1	ABERLE, JOSEPH	--	140	125	12	--	8.00		07/15/1976	I	112NRKF	418	8.5	--
154-078-25CBB2	ABERLE, JOSEPH	138	--	--	--	06/25/1975	8.00		06/25/1975	U	--	--	--	--
154-078-25CBC	ABERLE, JOSEPH	80	--	--	--	06/24/1975	--		--	U	--	--	--	--
154-078-25CCC	USBR 70-8	50	--	--	--	08/13/1970	31.90		08/19/1970	U	--	--	--	1551
154-078-25DAD	USBR 537	204	--	--	1.25	08/23/1972	21.91		09/10/1975	U	--	--	--	1549
154-078-26ACD	DUNIGAN, BOB	--	232	202	16	--	65.30		07/27/1977	I	112NRKF	440	9.0	--
154-078-26BBB	NDSWC 9384	320	234	228	1.25	08/05/1975	68.65		08/12/1975	U	112NRKF	480	8.0	1585
154-078-26CAA	LARSON, BOB	--	150	95	12	--	46.70		07/15/1976	I	112NRKF	440	8.0	--
154-078-26CAD	USBR 536	120	--	--	--	08/30/1972	15.30		08/30/1972	U	--	--	--	1537
154-078-26CBB	USBR 845	108	--	--	--	07/13/1972	--		--	U	--	--	--	1538
154-078-26CCC1	USBR 70-7	50	--	--	--	08/12/1970	26.20		08/19/1970	U	--	--	--	1551
154-078-26CCC2	NDSWC 9383	96	--	--	--	08/05/1975	--		--	U	--	--	--	1556
154-078-26CDA	USBR 536	120	45	--	--	08/25/1972	15.70		08/25/1972	U	--	--	--	1537
154-078-26CDB	UTHE, WILLIAM	102	--	--	--	10/31/1974	--		--	U	--	--	--	--
154-078-26DAB	NDSWC 1-77	160	--	--	--	02/18/1977	--		--	U	--	--	--	--
154-078-26DB	UTHE, WILLIAM	142	--	--	--	10/30/1974	--		--	U	--	--	--	--
154-078-26DBB1	IRRIGATION, H&L	160	--	--	--	05/03/1975	--		--	U	--	--	--	--
154-078-26DBB2	IRRIGATION, H&L	160	--	--	--	05/06/1975	--		--	U	--	--	--	--
154-078-26DBC1	IRRIGATION, H&L	140	--	--	--	05/03/1975	--		--	U	--	--	--	--
154-078-26DBC2	IRRIGATION, H&L	100	--	--	--	05/03/1975	--		--	U	--	--	--	--
154-078-26DCA	UTHE, WILLIAM	39	--	--	--	10/31/1974	--		--	U	--	--	--	--
154-078-26DCB	UTHE, WILLIAM	62	--	--	--	10/31/1974	--		--	U	--	--	--	--
154-078-27CAD	ASHLEY, STEPHEN	160	--	--	--	03/22/1975	--		--	U	--	--	--	--
154-078-27CBC	USBR 535	155	155	104	1.25	08/09/1972	25.70		09/09/1975	U	112NRKF	--	--	1543
154-078-27CDD	NDSWC 9558	100	65	62	1.25	05/19/1976	28.32		05/25/1976	U	112KLRH	--	--	1540

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154-078-27D8C	ASHLEY, STEPHEN	160	--	--	--	03/22/1975	--	--	U	--	--	--	--
154-078-28C8B	NDSWC 5848	280	--	--	--	09/30/1970	--	--	U	--	--	--	1550
154-078-28DAC	KRAFT, ARNOLD	162	--	--	--	10/12/1976	--	--	U	--	--	--	--
154-078-28DDB	KRAFT, ARNOLD	80	--	--	--	10/12/1976	--	--	U	--	--	--	--
154-078-29B8A	NDSWC 5314	51	--	--	--	05/24/1978	--	--	U	--	--	--	1485
154-078-31BAA1	NDSWC 4976	540	345	336	2	09/09/1976	40.82	10/28/1976	U	211FXML	4610	9.0	1550
154-078-31BAA2	NDSWC 4976A	300	300	294	2	09/10/1976	61.83	10/28/1976	U	211HLCK	4030	9.0	1550
154-078-32CAD	USBR 70-3	50	--	--	--	06/30/1970	12.90	08/07/1970	U	--	--	--	1568
154-078-33AAA	USBR 70-6	50	--	--	--	08/11/1970	31.90	08/19/1970	U	--	--	--	1553
154-078-33BAB	USBR 70-5	50	--	--	--	08/10/1970	17.40	08/13/1970	U	--	--	--	1552
154-078-33BBB	NDSWC 5843	60	--	--	--	09/29/1970	--	--	U	--	--	--	1540
154-078-33C8A	USBR 70-102	51	--	--	--	08/06/1970	5.80	08/13/1970	U	--	--	--	1543
154-078-33CCB	USBR 70-4	50	--	--	--	08/05/1970	24.00	08/13/1970	U	--	--	--	1568
154-078-33CCC	NDSWC 5842	80	63	57	1.25	09/29/1970	39.33	12/02/1974	U	125CNBL	--	--	1585
154-078-34DDD	NDSWC 9382	60	25	22	1.25	08/05/1975	20.52	08/12/1975	U	112KLRH	--	--	1552
154-078-35AAA	NDSWC 9386	60	31	28	1.25	08/06/1975	25.44	08/12/1975	U	112KLRH	--	--	1557
154-078-35A8C	IRRIGATION, H&L	150	--	--	--	05/03/1975	--	--	U	--	--	--	--
154-078-35B	IRRIGATION, H&L	40	--	--	--	05/24/1975	--	--	U	--	--	--	--
154-078-35BCC1	IRRIGATION, H&L	150	--	--	--	05/02/1975	--	--	U	--	--	--	--
154-078-35BCC2	IRRIGATION, H&L	45	45	22	12	05/13/1975	4.53	12/14/1976	I	112KLRH	650	10.0	--
154-078-35BCC3	IRRIGATION, H&L	53	--	--	--	05/24/1975	--	--	U	--	--	--	--
154-078-35BCC4	USBR	48	48	20	2	1975	3.80	09/09/1975	U	112KLRH	--	--	1548
154-078-35C	UTHE, WILLIAM	122	--	--	--	10/30/1974	--	--	U	--	--	--	--
154-078-35D	UTHE, WILLIAM	102	--	--	--	10/30/1974	--	--	U	--	--	--	--
154-078-36A	KRAFT, FRED	40	--	--	--	09/15/1976	--	--	U	--	--	--	--
154-078-36AA	KRAFT, FRED	60	--	--	--	09/15/1976	--	--	U	--	--	--	--
154-078-36AAA	NDSWC 9387	80	--	--	3	08/06/1975	18.34	09/10/1975	U	--	--	--	1550
154-078-36ACC	KRAFT, FRED	40	--	--	--	09/15/1976	--	--	U	--	--	--	--
154-078-36BAA	NDSWC 5312	60	--	--	--	05/23/1978	--	--	U	--	--	--	1554
154-078-36DDD	USBR 70-10	50	--	--	--	08/19/1970	7.40	08/27/1970	U	--	--	--	1542
154-079-09CCD	NDSWC 10068	100	--	--	--	11/14/1977	--	--	U	--	--	--	1562
154-079-14CCC1	NDSWC 5319	260	242	236	1.25	05/25/1978	51.44	07/06/1978	U	112NRKF	2700	9.5	1540
154-079-14CCC2	NDSWC 5319A	140	130	124	1.25	05/25/1978	50.70	07/06/1978	U	112NRKF	1700	8.0	1540
154-079-16CCC	NDSWC 10067	260	186	180	1.25	11/10/1977	61.52	04/26/1978	U	112NRKF	2400	8.5	1550
154-079-19BCB	USBR 55-50	40	--	--	--	08/17/1955	17.00	08/19/1955	U	--	--	--	1572
154-079-20ADD	USBR 55-49	38	--	--	--	08/17/1955	6.30	08/17/1955	U	--	--	--	1564
154-079-22CCC	USBR 55-48	38	--	--	--	08/16/1955	12.20	08/19/1955	U	--	--	--	1564
154-079-24DDD	NDSWC 10066	280	256	250	1.25	11/09/1977	90.41	04/26/1978	U	112NRKF	2800	9.0	1575
154-079-26BBC	USBR 55-47	40	--	--	--	08/15/1955	--	--	U	--	--	--	1558
154-079-26DCC	USBR 55-46	30	--	--	--	08/12/1955	22.60	08/15/1955	U	--	--	--	1562

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154-079-27AAA	NDSWC 10070	60	--	--	--	11/15/1977	--	--	U	--	--	--	1545
154-079-29ABA	NDSWC 10069	140	108	102	1.25	11/14/1977	72.59	11/28/1977	U	112NRKF	--	--	1565
154-079-30AAC	BREKKE, SAM	258	258	198	4	02/01/1974	43.00	02/01/1974	S	211MLCK	2300	8.0	--
154-079-36CAC	GJELLSTAD, WALTER	117	117	112	4	05/26/1972	11.00	05/26/1972	S	211MLCK	3500	7.5	--
154-080-02CCC	NDSWC 1383	63	--	--	--	09/11/1958	--	--	U	--	--	--	1560
154-080-04ABB	USBR 55-55	30	--	--	--	08/23/1955	7.20	08/25/1955	U	--	--	--	1560
154-080-09AAB	USBR 55-54	50	--	--	--	08/22/1955	12.10	08/25/1955	U	--	--	--	1574
154-080-11CBB	USBR 55-53	40	--	--	--	08/22/1955	--	--	U	--	--	--	1569
154-080-11CCB	NDGS 13	34	--	--	--	07/21/1970	--	--	U	--	--	--	1577
154-080-13BBB	USBR 55-52	40	--	--	--	08/19/1955	4.80	08/19/1955	U	--	--	--	1565
154-080-13BCC	USBR 55-51	40	--	--	--	08/18/1955	9.30	08/19/1955	U	--	--	--	1566
154-080-14BBB	NDSWC 5831	100	--	--	--	09/24/1970	--	--	U	--	--	--	1572
154-080-15DDD	NDSWC 1385	84	--	--	--	09/11/1958	--	--	U	--	--	--	1580
154-080-20BBB	NDSWC 5839	280	163	157	1.25	09/25/1970	67.43	12/02/1974	U	112NRKF	2390	8.5	1600
154-080-22ADD	NDSWC 5832	100	--	--	--	09/24/1970	--	--	U	--	--	--	1590
154-080-23CCC	NDSWC 5840	300	183	177	1.25	09/28/1970	66.36	12/02/1974	U	112NRKF	2300	7.5	1605
154-080-24DAA	NDSWC 5320	330	274	268	1.25	05/30/1978	61.97	07/14/1978	U	112NRKF	1900	9.0	1595
154-080-26BBB	NDSWC 1387	53	--	--	--	09/12/1958	--	--	U	--	--	--	1606
154-080-26CCC	NDSWC 1388	116	--	--	--	09/11/1958	--	--	U	--	--	--	1615
154-080-32BBB	NDSWC 5837	120	--	--	--	09/25/1970	--	--	U	--	--	--	1630
154-080-34ADD	NDSWC 5833	80	--	--	--	09/24/1970	--	--	U	--	--	--	1603
155-075-03ADD	CARPENTER, RUPALD	61	61	56	4	08/28/1972	15.00	08/28/1972	S	211FXML	1300	7.5	--
155-075-04BBB	NDSWC 10033	80	--	--	--	10/27/1977	--	--	U	--	--	--	1505
155-075-12AAB	NDSWC 10034	100	--	--	--	10/28/1977	--	--	U	--	--	--	1530
155-075-14CDD	NDGS 11	74	--	--	--	07/20/1970	--	--	U	--	--	--	1575
155-075-15BBB	NDSWC 4987	260	111	105	2	09/22/1976	11.39	11/02/1976	U	211FXML	2700	8.7	1515
155-075-21AAA	NDSWC 4988	130	--	--	--	09/23/1976	--	--	U	--	--	--	1505
155-075-23ABB	BURCKHARD, JOHN	99	99	--	--	--	--	--	H,S	211FXML	650	8.5	--
155-075-27CCB	NDSWC 10179	180	--	--	--	08/08/1978	--	--	U	--	--	--	1514
155-075-28AAA	NDSWC 4989	300	--	--	--	09/23/1976	--	--	U	--	--	--	1510
155-075-28ABB	NDSWC 4990	280	--	--	--	09/23/1976	--	--	U	--	--	--	1512
155-076-02CCC	NDSWC 9573	260	235	232	1.25	05/26/1976	5.58	06/23/1976	U	211FXML	--	--	1510
155-076-04BBB	NDSWC 10030	140	--	--	--	10/27/1977	--	--	U	--	--	--	1455
155-076-05A	ODLAND, LYNN	80	--	--	--	03/18/1976	--	--	U	--	--	--	--
155-076-05AA	ODLAND, LYNN	35	--	--	--	03/18/1976	--	--	U	--	--	--	--
155-076-05D	ODLAND, LYNN	100	--	--	--	03/18/1976	--	--	U	--	--	--	--
155-076-05DC	ODLAND, LYNN	50	--	--	--	03/18/1976	--	--	U	--	--	--	--
155-076-10BBA1	NDSWC 9379	200	--	--	--	08/04/1975	--	--	U	--	--	--	1502
155-076-10BBA2	NDSWC 9379A	40	36	33	1.25	08/04/1975	5.76	08/06/1975	U	112LKSU	440	8.0	1502
155-076-10CCC	NDSWC 9380	140	26	23	1.25	08/04/1975	5.59	08/07/1975	U	112LKSU	500	8.5	1510

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155-076-21AAA	NDSWC 5856	100	40	37	1.25	10/13/1970	4.34	10/05/1978	U	112LKSD	560	8.5	1510
155-076-28BBB	NDSWC 9381	80	26	23	1.25	08/04/1975	5.36	08/07/1975	U	112LKSD	520	8.0	1510
155-076-29DDD	NDSWC 9574	100	--	--	--	05/26/1976	--	--	U	--	--	--	1505
155-076-33CCC	NDSWC 10029	60	--	--	--	10/27/1977	--	--	U	--	--	--	1505
155-077-04C8C	NDSWC 9572	100	--	--	--	05/26/1976	--	--	U	--	--	--	1515
155-077-12CAD	LEACH, TOM	54	52	42	4	11/26/1963	5.00	11/26/1963	S	112SURV	--	--	--
155-077-12C8D	LEACH, TOM	140	--	--	--	11/27/1963	--	--	U	--	--	--	--
155-077-13CCC	LEACH, TOM	55	--	--	--	11/27/1963	--	--	U	--	--	--	--
155-077-13CCD	LEACH, TOM	50	--	--	--	11/27/1963	--	--	U	--	--	--	--
155-077-17AAA	NDSWC 5857	100	40	37	1.25	10/13/1970	12.75	12/04/1974	U	112LKSD	370	8.5	1520
155-077-24BDC	NELSON, KENNETH	90	90	--	4	11/08/1973	15.00	11/08/1973	S	112SURV	530	8.5	--
155-077-24CCC	NDSWC 10059	60	--	--	--	11/08/1977	--	--	U	--	--	--	1460
155-077-24DCC	NDGS 9	34	--	--	--	07/18/1970	--	--	U	--	--	--	1510
155-077-26BAA	NDSWC 10058	90	76	73	1.25	11/08/1977	4.77	04/25/1978	U	112SURV	430	9.0	1460
155-077-27A8D	NDSWC 10057	80	51	45	1.25	11/08/1977	1.80+	04/26/1978	U	112SURV	480	8.0	1465
155-077-28ABC	NDSWC 10056	120	--	--	--	11/03/1977	--	--	U	--	--	--	1515
155-077-31CCC	NDSWC 10060	60	--	--	--	11/08/1977	--	--	U	--	--	--	1492
155-078-01BA	KELLY, DAN	36	36	33	4	06/20/1972	11.00	06/20/1972	H	--	--	--	--
155-078-07BBB	NDSWC 10134	80	--	--	--	07/19/1978	--	--	U	--	--	--	1492
155-078-16DDD	NDSWC 5858	100	20	17	1.25	10/13/1970	7.31	12/04/1974	U	112LKSD	1050	8.0	1518
155-078-19AAA	NDSWC 5868	100	--	--	--	10/15/1970	--	--	U	--	--	--	1520
155-078-19A8B	LAVALLEY, MAURICE	20	20	--	--	--	--	--	H	112LKSD	490	8.5	--
155-078-21B8B	NDSWC 10133	80	--	--	--	07/19/1978	--	--	U	--	--	--	1516
155-078-24BAD	NDGS 8	50	--	--	--	07/17/1970	--	--	U	--	--	--	1570
155-078-29CAC	FRAUNFELTER, GUY	22	--	--	--	10/17/1973	--	--	U	--	--	--	--
155-078-29CBA	FRAUNFELTER, GUY	37	--	--	--	10/17/1973	--	--	U	--	--	--	--
155-078-29CCC	FRAUNFELTER, GUY	22	--	--	--	10/17/1973	--	--	U	--	--	--	--
155-078-29DCD	NDSWC 10132	80	--	--	--	07/18/1978	--	--	U	--	--	--	1510
155-078-30DAB	FRAUNFELTER, GUY	22	--	--	--	10/17/1973	--	--	U	--	--	--	--
155-078-30DCA	FRAUNFELTER, GUY	19	--	--	--	10/17/1973	--	--	U	--	--	--	--
155-079-05A	BREKKE, DUANE	62	--	--	--	01/22/1976	--	--	U	--	--	--	1505
155-079-05C	BREKKE, DUANE	62	--	--	--	02/26/1976	--	--	U	--	--	--	1510
155-079-05D	BREKKE, DUANE	42	--	--	--	01/22/1976	--	--	U	--	--	--	--
155-079-06DDD	NDSWC 10131	80	--	--	--	07/18/1978	--	--	U	--	--	--	1510
155-079-08A	GRANVILLE,ND	82	--	--	--	01/31/1976	--	--	U	211HLCK	--	--	1519
155-079-08ADD	HEINE, OSCAR	55	55	45	4	07/31/1976	15.00	07/31/1976	H	--	--	--	--
155-079-09D	ANDERSON, MORRIS	90	--	--	--	07/26/1971	--	--	U	--	--	--	--
155-079-10BAB	ANDERSON, MORRIS	54	--	--	--	07/26/1971	--	--	U	--	--	--	1505
155-079-10C	ANDERSON, MORRIS	70	--	--	--	07/26/1971	--	--	U	--	--	--	--
155-079-19B	ANDERSON, MORRIS	160	--	--	--	07/23/1971	--	--	U	--	--	--	--

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155-079-19BA	ANDERSON, C.	82	--	--	--	06/26/1972	--		--	U	--	--	--	--
155-079-19BAC	ANDERSON, C.	100	--	--	--	06/28/1972	--		--	U	--	--	--	--
155-079-20DDD	NDSWC 10127	120	--	--	--	07/12/1978	--		--	U	--	--	--	1510
155-079-21AAA	NDSWC 5867	80	--	--	--	10/14/1970	--		--	U	--	--	--	1505
155-079-23DAD	BOUTILIER, RUSS	138	34	29	4	08/02/1976	12.00		08/03/1976	S	--	--	--	1515
155-079-29ADA	FREY RANCH	50	50	46	4	07/20/1976	15.00		07/20/1976	H	--	--	--	--
155-079-29M	FREY RANCH	222	28	24	4	02/09/1976	4.00		02/09/1976	S	--	--	--	--
155-079-29CCC	NDSWC 10126	100	--	--	--	07/12/1978	--		--	U	--	--	--	1522
155-080-06CDD	JORDE, DAVID	60	60	--	--	01/01/1975	13.00		07/01/1975	H	1128NDU	1030	8.5	--
155-080-07CBB	AUS, PERRY	293	150	--	--	01/01/1975	23.10	R	07/01/1975	H	1128NDU	1280	10.5	--
155-080-09AAA	NDSWC 1391	60	--	--	--	09/15/1958	--		--	U	--	--	--	1530
155-080-09DAA	NDSWC 10130	100	--	--	--	07/18/1978	--		--	U	--	--	--	1510
155-080-10ABA	HAGLIEN, LOREN	52	42	34	24	04/30/1974	31.38	R	07/01/1975	H,S	1128NDU	1080	7.5	--
155-080-10DCD	KEITH, LEON	104	104	--	--	1968	16.40	R	07/01/1975	H	211HLCK	4000	--	--
155-080-11BBA	NDSWC 10129	60	--	--	--	07/13/1978	--		--	U	--	--	--	1517
155-080-13AAD	THOMPSON, ERIC	122	52	32	4	11/04/1976	19.00		11/04/1976	S	--	--	--	--
155-080-14AAA	SALLEE, WILLIAM	116	116	--	--	01/01/1949	23.75	R	07/02/1975	H,S	211HLCK	4100	8.5	--
155-080-15AAA	NDSWC 4977	560	311	300	2	09/13/1976	1.79		11/16/1976	U	211FXHL	4670	8.0	1510
155-080-17BBD	HANSON, W.	110	110	--	--	01/01/1975	6.92	R	07/01/1975	H	211HLCK	3250	8.5	--
155-080-17CAC	BRUHN, EARL	204	164	124	4	06/23/1973	47.67	R	07/01/1975	H	211HLCK	4200	8.0	--
155-080-17CBA	BRUHN, EARL	204	164	124	4	06/23/1973	48.00		06/23/1973	H	--	--	--	--
155-080-19CCB1	LENTON, GARY	28	28	--	--	01/01/1975	11.20	R	07/02/1975	H,S	1128NDU	5000	8.5	--
155-080-19CCB2	LENTON, GARY	330	330	--	--	01/01/1975	160.00		07/02/1975	S,H	211FXHL	4900	9.0	--
155-080-19CCB3	USBR 55-59	40	--	--	--	08/26/1955	13.70		08/26/1955	U	--	--	--	1564
155-080-22AAA	NDSWC 1388	63	--	--	--	09/13/1958	--		--	U	--	--	--	1540
155-080-23BCC	NDGS 12	49	--	--	--	07/21/1970	--		--	U	--	--	--	1540
155-080-24AAA	NDSWC 10128	160	139	136	1.25	07/12/1978	12.60		08/08/1978	U	--	--	--	1518
155-080-29CDC	USBR 55-57	40	--	--	--	08/24/1955	13.50		08/25/1955	U	--	--	--	1567
155-080-30BCB	USBR 55-58	34	--	--	--	08/25/1955	13.80		08/31/1955	U	--	--	--	1558
155-080-33DAD	USBR 55-56	35	--	--	--	08/24/1955	5.80		08/25/1955	U	--	--	--	1563
155-080-35BBB	NDSWC 1390	63	--	--	--	07/15/1958	--		--	U	--	--	--	1540
156-075-19DDD	NDSWC 10032	100	--	--	--	10/27/1977	--		--	U	--	--	--	1508
156-075-20DAA	NDGS 10	39	--	--	--	07/26/1970	--		--	U	--	--	--	1506
156-075-22CCC	NDSWC 4986	260	90	84	2	09/22/1976	12.40		11/02/1976	U	211FXHL	3500	7.5	1508
156-075-33CBC	SCHMALTZ, AUGUSTINE	175	175	63	4	04/11/1975	8.06		07/08/1975	S	--	--	--	--
156-076-08AAB	NDSWC 5861	80	25	22	1.25	10/14/1970	3.16		12/04/1974	U	112SURV	590	8.0	1460
156-076-09ABC	NDSWC 10037	50	40	37	1.25	10/31/1977	5.20		05/01/1978	U	112SURV	1300	8.0	1455
156-076-09BAA	NDGS 5	29	--	--	--	07/17/1970	--		--	U	--	--	--	1454
156-076-10BDB1	NDSWC 10035	40	--	--	--	10/26/1977	--		--	U	--	--	--	1455
156-076-10BDB2	NDSWC 10036	36	--	--	--	10/26/1977	--		--	U	--	--	--	1455

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156-076-11BAB	TOWNER,ND	41	41	28	12	09/01/1964	13.15	R	09/ /1964	P	112SURV	650	10.0	--
156-076-11BAC	TOWNER,ND	--	42	--	--	01/01/1975	12.00	P	07/15/1975	P	112SURV	650	8.5	--
156-076-22DDD	NDSWC 9376	100	--	--	--	07/30/1975	--		--	U	--	--	--	1492
156-076-26CCC	NDSWC 9377	100	--	--	--	07/30/1975	--		--	U	--	--	--	1498
156-076-28CCC	NDSWC 10031	140	--	--	--	10/27/1977	--		--	U	--	--	--	1455
156-076-29AAA	NDSWC 10361	100	--	--	--	10/31/1978	--		--	U	--	--	--	1455
156-076-29BBD	LUNDAY, LYLE	49	47	43	4	10/25/1966	3.80	Z	07/16/1975	S	--	--	--	--
156-076-30AAA	NDSWC 10172	120	--	--	--	08/07/1978	--		--	U	--	--	--	1452
156-076-30BAD	WITHAM, LYLE	47	45	--	17	07/28/1960	6.00		07/28/1960	I	--	--	--	--
156-076-30BDA	WITHAM, LYLE	60	57	--	17	08/10/1960	8.00		08/10/1960	I	--	--	--	--
156-076-34DDD	NDSWC 9378	160	--	--	--	08/04/1975	--		--	U	--	--	--	1502
156-077-03DDD	NDSWC 10171	200	156	150	1.25	08/02/1978	17.09		08/21/1978	U	112DNBH	500	9.0	1501
156-077-04CCC	NDSWC 9374	160	--	--	--	07/30/1975	--		--	U	--	--	--	1500
156-077-08BBB	NDSWC 9569	140	108	102	1.25	05/25/1976	5.29		06/23/1976	U	112DNBH	460	8.0	1500
156-077-10BBB	NDSWC 10170	180	159	156	1.25	08/01/1978	5.73		09/12/1978	U	112DNBH	2650	9.0	1495
156-077-12AAA	NDSWC 9367	100	--	--	--	07/29/1975	--		--	U	--	--	--	1480
156-077-12BBB	NDSWC 9568	160	--	--	--	05/25/1976	--		--	U	--	--	--	1500
156-077-13BAB1	NDSWC 9368	160	--	--	--	07/29/1975	--		--	U	--	--	--	1476
156-077-13BAB2	NDSWC 9368A	40	40	37	1.25	07/29/1975	3.43		07/31/1975	U	112DNBH	570	8.0	1476
156-077-13BCC	NDSWC 10052	120	--	--	--	11/03/1977	--		--	U	--	--	--	1475
156-077-13CCB1	NDSWC 9369	160	126	123	1.25	07/29/1975	2.94		07/31/1975	U	112DNBH	2300	8.0	1475
156-077-13CCB2	NDSWC 9369A	60	56	53	1.25	07/29/1975	3.31		07/31/1975	U	112DNBH	400	7.5	1475
156-077-16DDD1	NDSWC 5860	160	--	--	--	10/13/1970	--		--	--	--	--	--	1498
156-077-16DDD2	NDSWC 5860A	60	40	37	1.25	10/13/1970	9.18		12/04/1974	U	112DNBH	550	7.5	1498
156-077-17AAA	NDSWC 9570	120	47	44	1.25	05/26/1976	4.48		06/23/1976	U	112DNBH	770	8.5	1503
156-077-22BBA	EDWARDS, ALLAN	75	--	--	--	05/01/1974	--		--	U	--	--	--	--
156-077-22BBB	EDWARDS, ALLAN	75	--	--	--	05/01/1974	--		--	U	--	--	--	--
156-077-22BBC	EDWARDS, ALLAN	55	--	--	--	05/01/1974	--		--	U	--	--	--	--
156-077-22CAC	EDWARDS, ALLAN	105	--	--	--	05/01/1974	--		--	U	--	--	--	--
156-077-22CCC	NDSWC 9372	100	81	78	1.25	07/30/1975	4.12		07/30/1975	U	211FXHL	1030	8.0	1497
156-077-22DBA1	EDWARDS, ALLAN	105	--	--	--	05/01/1974	--		--	U	--	--	--	--
156-077-22DBA2	EDWARDS, ALLAN	65	51	36	12	10/01/1974	4.81	R	07/15/1975	I	112DNBH	1000	9.5	--
156-077-22DBB	EDWARDS, ALLAN	105	--	--	--	05/01/1974	--		--	U	--	--	--	--
156-077-22DBC	EDWARDS, ALLAN	135	36	26	12	05/01/1974	7.52	R	07/15/1975	I	112DNBH	700	8.5	--
156-077-23ADC	EDWARDS, ALLAN	62	62	47	12	10/01/1974	4.00	R	12/01/1974	I	112DNBH	540	8.5	--
156-077-23BDD	EDWARDS, ALLAN	90	63	45	12	10/ /1974	4.00	R	11/ /1974	I	--	--	--	--
156-077-23CAB	EDWARDS, ALLAN	105	50	35	12	05/01/1974	4.00	R	11/01/1974	I	--	--	--	--
156-077-23CBC	EDWARDS, ALLAN	53	--	--	--	10/01/1974	--		--	U	--	--	--	--
156-077-23DAC	EDWARDS, ALLAN	60	--	--	--	10/01/1974	--		--	U	--	--	--	--
156-077-23DBD	EDWARDS, ALLAN	105	62	47	12	05/01/1974	4.00	R	12/01/1974	I	112DNBH			

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156-077-24CCC	NDSWC 9370	140	51	48	1.25	07/29/1975	4.88		07/31/1975	U	112DNBH	530	8.0	1482
156-077-24CDD	NDSWC 9375	140	56	53	1.25	07/30/1975	7.96		07/31/1975	U	112DNBH	540	9.0	1484
156-077-27AAA	NDSWC 9371	120	31	28	1.25	07/29/1975	7.13		07/30/1975	U	112DNBH	520	7.5	1480
156-077-29BBC	NDSWC 9373	120	31	28	1.25	07/30/1975	5.75		07/30/1975	U	112DNBH	650	7.5	1515
156-077-33BCB	NDSWC 9571	120	--	--	--	05/26/1976	--		--	U	--	--	--	1520
156-078-01DDA	NDGS 6	74	--	--	--	07/17/1970	--		--	U	--	--	--	1580
156-078-06CCC	NDSWC 10166	120	--	--	--	07/31/1978	--		--	U	--	--	--	1494
156-078-08AAA	NDSWC 10167	100	--	--	--	07/31/1978	--		--	U	--	--	--	1495
156-078-11BBB	NDSWC 10169	120	--	--	--	08/01/1978	--		--	U	--	--	--	1501
156-078-16DDD	NDSWC 5859	100	--	--	--	10/13/1970	--		--	U	--	--	--	1510
156-078-31AA	BRANDT, DALE	27	--	--	--	10/19/1973	--		--	U	--	--	--	--
156-078-33BBB	NDSWC 10135	100	51	--	1.25	07/19/1978	4.00		08/02/1978	U	112UTSH	850	8.0	1496
156-079-03DDD	USGS	97	--	--	--	07/08/1946	6.59		07/09/1946	U	--	--	--	--
156-079-10AAA	USGS	103	103	77	5	07/02/1946	7.00		07/02/1946	U	--	--	--	--
156-079-10AAD	USGS	121	121	102	4	07/16/1946	4.61		10/24/1952	U	--	--	--	1480
156-079-10ADA	USGS	100	--	--	--	06/24/1946	--		--	U	--	--	--	--
156-079-13DBB	NDSWC 10136	120	--	--	--	07/19/1978	--		--	U	--	--	--	1480
156-079-14BBB	NDSWC 5865	80	--	--	--	10/14/1970	--		--	U	--	--	--	1490
156-079-16BBC	NDSWC 5866	60	--	--	--	10/14/1970	--		--	U	--	--	--	1490
156-080-03BBB	NDSWC 10138	100	--	--	--	07/19/1978	--		--	U	--	--	--	1508
156-080-21CDC	MERTZ, ALLEN	198	196	--	4	08/27/1976	140.00		08/27/1976	H	--	--	--	--
156-080-35BBB	NDSWC 1392	63	--	--	--	09/16/1958	--		--	U	--	--	--	1515
156-080-36DDD	LIPPMAN, ALFRED	152	152	123	4	07/15/1976	19.00		07/15/1976	H	--	--	--	--
157-075-06AAA	NDSWC 10175	80	--	--	--	08/08/1978	--		--	U	--	--	--	1454
157-075-08CDD	NDSWC 10360	200	--	--	--	10/31/1978	--		--	U	--	--	--	1467
157-075-08DCB	HUTTON, ROY	27	27	23	4	12/07/1976	4.00		12/07/1976	S	--	--	--	--
157-075-11CAA	STUTRUD, CURTIS	100	--	--	--	05/31/1974	--		--	U	--	--	--	--
157-075-17BBB	NDGS 2	74	--	--	--	07/16/1970	--		--	U	--	--	--	1475
157-075-20BBB1	NDSWC 4985	240	176	176	2	09/22/1976	47.30		10/04/1978	U	211FXHL	--	--	1482
157-075-20BBB2	NDSWC 4985A	40	40	34	1.25	09/22/1976	21.65		11/03/1976	U	112SGRV	530	8.0	1482
157-075-24DDD	NDSWC 9397	220	--	--	--	08/12/1975	--		--	U	--	--	--	1485
157-075-30AAA	NDSWC 10178	80	--	--	--	08/08/1978	--		--	U	--	--	--	1472
157-075-31AAB1	NDSWC FS-1	84	84	64	1.25	11/01/1966	19.80		12/14/1976	U	211FXHL	--	--	1485
157-075-31AAB2	NDSWC FS-1A	50	30	20	4	11/01/1966	16.42		12/13/1977	U	112SGRV	620	8.0	1485
157-075-31DAD	NURSERY, TURNER	40	40	--	--	--	12.00	R	07/08/1975	I	112SGRV	420	8.5	1480
157-075-31DBC	NURSERY, TURNER	40	40	--	--	--	17.60		07/08/1975	I	112SGRV	560	8.5	1480
157-075-31DBD	NURSERY, TURNER	40	40	--	--	--	17.00		--	I	112SGRV	500	9.0	1480
157-075-31DCC	NURSERY, TURNER	--	44	--	--	--	11.30	R	07/08/1975	I	112SGRV	880	8.5	1480
157-075-31DDA	NURSERY, TURNER	26	26	--	--	--	5.70	R	07/08/1975	I	112SGRV	440	8.5	1480
157-075-31DDB	NURSERY, TURNER	35	35	--	--	--	10.40	R	07/08/1975	I	112SGRV	730	8.5	1480

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157-076-02BBB	NDSWC 10173	220	--	--	--	08/07/1978	--		--	U	--	--	--	1448
157-076-11AAA	NDSWC 10174	200	--	--	--	08/08/1978	--		--	U	--	--	--	1450
157-076-12ABB	CHRISTENSEN, RALPH	42	42	39	4	11/17/1973	6.00		11/17/1973	H	112SORV	690	--	--
157-076-14BBB	NDSWC 10039	80	42	39	1.25	11/01/1977	6.74		05/01/1978	U	112SORV	1500	8.5	1460
157-076-16AAA	NDSWC 5862	100	--	--	--	10/14/1970	--		--	U	--	--	--	1477
157-076-21CCD	SVEUND, OLIVER	87	87	78	4	09/22/1966	27.00		09/22/1966	S	--	--	--	1495
157-076-22DCC	SVEUND, OLIVER	87	87	--	4	09/22/1966	27.00	R	09/22/1966	H,S	211FXHL	1310	--	1490
157-076-25BBB	NDSWC 10038	40	--	--	--	11/01/1977	--		--	U	--	--	--	1455
157-076-28D	BURCKHARD, BALZER	75	75	70	4	11/25/1964	18.00		11/25/1964	S	--	--	--	--
157-076-29AD	JONDE, HENRY	160	--	--	--	12/01/1964	--		--	U	--	--	--	--
157-076-34BAA	NDSWC 9365	80	21	18	1.25	07/28/1975	5.52		07/31/1975	U	112SORV	1300	8.5	1465
157-076-34DDD	NDSWC 9366	80	16	16	1.25	07/28/1975	6.53		10/03/1978	U	112SORV	--	--	1465
157-076-35CBD	THOMPSON,ND	72	--	--	--	04/06/1973	--		--	U	--	--	--	--
157-076-35CCB	THOMPSON,ND	75	--	--	--	04/06/1973	--		--	U	--	--	--	--
157-076-35CDB	THOMPSON,ND	69	--	--	--	04/06/1973	--		--	U	--	--	--	--
157-077-11DAD	NDSWC 10042	100	--	--	--	11/01/1977	--		--	U	--	--	--	1472
157-077-12CCD	NDSWC 10040	100	--	--	--	11/01/1977	--		--	U	--	--	--	1475
157-077-14AAA	NDSWC 10041	100	--	--	--	11/01/1977	--		--	U	--	--	--	1478
157-077-15CCC	NDSWC 5863	140	--	--	--	10/14/1970	--		--	U	--	--	--	1498
157-077-26C	HAMAN, ED	125	125	109	4	11/24/1964	20.00		11/24/1964	S	--	--	--	--
157-077-27DDD	NDSWC 10054	120	--	--	--	11/03/1977	--		--	U	--	--	--	1490
157-077-34DDD	NDSWC 10053	160	--	--	--	11/03/1977	--		--	U	--	--	--	1485
157-077-36BBB	NDSWC 10055	120	--	--	--	11/03/1977	--		--	U	--	--	--	1488
157-078-01CCC	NDSWC 10161	140	--	--	--	07/27/1978	--		--	U	--	--	--	1491
157-078-08ADD	NDSWC 10359	120	--	--	--	10/31/1978	--		--	U	--	--	--	1475
157-078-12CCD	NDSWC 10162	160	--	--	--	07/28/1978	--		--	U	--	--	--	1510
157-078-13CCC	NDSWC 10163	160	96	90	1.25	07/28/1978	27.97		10/03/1978	U	112CBKC	530	8.5	1512
157-078-23DDD	NDSWC 10164	160	128	125	1.25	07/28/1978	22.30		10/04/1978	U	112CBKC	610	9.0	1505
157-078-25CCC	NDSWC 10165	120	--	--	--	07/31/1978	--		--	U	--	--	--	1492
157-078-27AAA	NDSWC 5864	140	--	--	--	10/14/1970	--		--	U	--	--	--	1500
157-079-04DDC	WOODALL, DUANE	222	218	138	4	08/30/1976	19.00		08/30/1976	S	--	--	--	--
157-079-15DDC	STROH, MICHAEL	103	103	85	4	10/12/1976	30.00		10/12/1976	H	--	--	--	--
157-079-23BBB	NDSWC 5869	120	--	--	--	10/15/1970	--		--	U	--	--	--	1490
157-079-29CCC	NDSWC 10137	120	--	--	--	07/19/1978	--		--	U	--	--	--	1500
157-080-03DDD	NDSWC 1389	84	--	--	--	09/13/1958	--		--	U	--	--	--	1500
157-080-07CAA	HANSEN, JERRY	70	--	--	--	05/22/1975	--		--	U	--	--	--	--
157-080-07CAD	HANSEN, JERRY	70	--	--	--	05/22/1975	--		--	U	--	--	--	--
157-080-11CCC	NDSWC 5870	120	--	--	--	10/15/1970	--		--	U	--	--	--	1505
157-080-18DDD1	NDSWC 4978	560	338	328	2	09/14/1976	36.62		12/15/1976	U	211FXHL	--	--	1535
157-080-18DDD2	NDSWC 4978A	200	200	194	2	09/15/1976	28.91		12/15/1976	U	211HLCK	--	--	1535

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157-080-30AAA	DEERING,ND	--	15	--	--	--	--		--	P	112OTSH	660	9.0	--
157-080-30ABA	DEERING,ND	--	27	--	--	--	--		--	P	112OTSH	720	10.0	--
157-080-35ACD	ANHORN, ROGER	40	--	--	--	07/02/1976	--		--	U	--	--	--	--
157-080-35DBA	ANHORN, ROGER	120	--	--	--	07/02/1976	--		--	U	--	--	--	--
157-080-35DBC	ANHORN, ROGER	40	27	17	16	07/02/1976	9.89		07/02/1976	I	112OTSH	--	--	--
157-080-36CBA	GOHEEN, IVAN	105	--	--	--	07/22/1971	--		--	U	--	--	--	--
157-080-36CBB	NDSWC 10139	120	--	--	--	07/24/1978	--		--	U	--	--	--	1509
158-075-07DDA	NDGS 1	34	--	--	--	07/16/1970	--		--	U	--	--	--	1453
158-075-09DDD	NDSWC 10177	160	--	--	--	08/08/1978	--		--	U	--	--	--	1481
158-075-12ABC	MEDALEN, DAVID	30	30	14	24	10/18/1976	12.00		10/18/1976	S	--	--	--	--
158-075-21BBB	NDSWC 10051	120	--	--	--	11/02/1977	--		--	U	--	--	--	1465
158-075-22AAA	NDSWC 4984	300	--	--	--	09/21/1976	--		--	U	--	--	--	1475
158-075-26BBB	NDSWC 10176	120	--	--	--	08/08/1978	--		--	U	--	--	--	1466
158-076-13BCB	NDSWC 4983	300	161	155	2	09/21/1976	12.55		10/04/1978	U	211FXHL	--	--	1452
158-076-14CDC	NDSWC 10045	60	34	28	1.25	11/02/1977	5.23		05/01/1978	U	112SDHV	840	9.0	1440
158-076-14DBD	NDSWC 10046	60	--	--	--	11/02/1977	--		--	U	--	--	--	1440
158-076-20BBB	NDSWC 10159	220	--	--	--	07/27/1978	--		--	U	--	--	--	1456
158-076-21AAB	NDSWC 10044	80	--	--	--	11/01/1977	--		--	U	--	--	--	1440
158-077-05DDD	NDSWC 10157	120	--	--	--	07/27/1978	--		--	U	--	--	--	1460
158-077-06ADD	JOHNSON, RUN	17	17	13	36	10/25/1974	9.00	R	10/25/1974	H	112LKSU	1860	9.5	1455
158-077-08DDA	HALLEY, K.	--	25	--	--	01/01/1950	10.55		06/23/1950	H,S	112LKSU	609	--	1463
158-077-08DDD	USBR	50	--	--	--	01/01/1950	--		--	U	--	--	--	1460
158-077-11BBB	NDSWC 10158	180	--	--	--	07/27/1978	--		--	U	--	--	--	1457
158-077-21BBB	NDSWC 5875	140	--	--	--	10/16/1970	--		--	U	--	--	--	1460
158-077-23BBB	NDSWC 10043	100	--	--	--	11/01/1977	--		--	U	--	--	--	1455
158-077-24AAA	NDSWC 4982	400	--	--	--	09/20/1976	--		--	U	--	--	--	1455
158-078-08CBA1	PODOLL, OWEN	98	90	60	4	08/02/1976	21.00		08/02/1976	S	--	--	--	--
158-078-08CBA2	PODOLL, OWEN	180	180	105	4	08/19/1976	23.00		08/19/1976	S	--	--	--	1450
158-078-08DDC	BRANDT, LEONARD	--	34	--	--	01/01/1950	15.38		07/07/1950	H	--	--	--	1454
158-078-11DDD	NDSWC 10155	120	--	--	--	07/27/1978	--		--	U	--	--	--	1450
158-078-13DDD1	NDSWC 4981	300	150	144	2	09/17/1976	6.32		10/03/1978	U	211FXHL	--	--	1455
158-078-13DDD2	NDSWC 4981A	80	77	71	1.25	09/17/1976	7.04		10/28/1976	U	112BKDU	800	7.0	1455
158-078-14CCB	NDSWC 10154	120	--	--	--	07/26/1978	--		--	U	--	--	--	1450
158-078-15CCC	USBR	150	--	--	--	--	--		--	U	--	--	--	1442
158-078-15DCC	USBR	152	--	--	--	--	--		--	U	--	--	--	1452
158-078-16DDD	NDSWC 10153	120	--	--	--	07/26/1978	--		--	U	--	--	--	1440
158-078-20BBB	NDSWC 5874	120	--	--	--	10/16/1970	--		--	U	--	--	--	1462
158-078-20DAD	LONG, JAMES	19	18	10	30	10/14/1972	8.00	R	10/14/1972	S	112LKSU	1350	7.5	1460
158-078-26AAA	NDSWC 10358	120	--	--	--	10/31/1978	--		--	U	--	--	--	1455
158-078-31ABB	WICKMAN, GERALD	132	--	--	--	01/01/1969	--		--	U	--	--	--	1460

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158-078-31ACB	WICKMAN, GERALD	108	--	--	--	01/01/1969	--		--	U	--	--	--	--
158-078-31ACC	WICKMAN, GERALD	180	--	--	--	01/01/1969	--		--	U	--	--	--	1490
158-078-31ADB	WICKMAN, GERALD	135	--	--	--	01/01/1969	--		--	U	--	--	--	--
158-078-31BCA	WICKMAN, GERALD	122	--	--	--	01/01/1969	--		--	U	--	--	--	--
158-078-36BBB	NDSWC 10160	120	--	--	--	07/27/1978	--		--	U	--	--	--	1454
158-079-04BBB	NDSWC 10357	300	--	--	--	10/30/1978	--		--	U	--	--	--	1456
158-079-13CCC	NDSWC 4980	340	172	166	2	09/16/1976	15.36		10/28/1976	U	211FXHL	5210	8.0	1474
158-079-16AAA	NDSWC 10151	280	--	--	--	07/26/1978	--		--	U	--	--	--	1474
158-079-16CCB	NDSWC 10145	120	--	--	--	07/25/1978	--		--	U	--	--	--	1460
158-079-18DDD	NDSWC 10146	140	--	--	--	07/25/1978	--		--	U	--	--	--	1466
158-079-21AAA	NDSWC 5873	140	--	--	--	10/15/1970	--		--	U	--	--	--	1474
158-079-22AAA1	USBR S-23	20	20	17	2	--	7.72		--	U	112LKSU	560	9.0	1474
158-079-22AAA2	USBR	--	13	--	--	01/01/1951	--		--	U	112LKSD	1630	--	--
158-079-22AAA3	NDSWC 10150	160	134	131	1.25	07/26/1978	11.64		10/03/1978	U	112CBKC	1110	8.0	1475
158-079-23DCC	NDSWC 10149	160	143	137	1.25	07/26/1978	10.26		10/03/1978	U	112CBKC	1650	8.5	1470
158-079-23DDD	NDSWC 10147	160	--	--	--	07/25/1978	--		--	U	--	--	--	1466
158-079-35AAA	NDSWC 10148	140	--	--	--	07/26/1978	--		--	U	--	--	--	1460
158-080-12DDD	NDSWC 10144	160	--	--	--	07/25/1978	--		--	U	--	--	--	1475
158-080-13DDD	NDSWC 4979	340	164	158	1.25	09/16/1976	17.29		10/28/1976	U	211FXHL	--	--	1478
158-080-22BBB	NDSWC 5871	140	--	--	--	10/15/1970	--		--	U	--	--	--	1489
159-076-14BBA	NDSWC 10050	60	--	--	--	11/02/1977	--		--	U	--	--	--	1445
159-077-05ADD	BOEHNKE, ROBERT	48	48	42	16	08/06/1974	5.77	R	07/09/1975	H,S	112SORV	4000	7.5	1465
159-077-08AAA	NDSWC 635	130	--	--	--	01/01/1952	--		--	U	--	--	--	1460
159-077-08AAB	USBR	55	--	--	--	--	--		--	U	--	--	--	1460
159-077-08CBB	NDSWC 634	140	--	--	--	10/24/1952	--		--	U	--	--	--	1435
159-077-17AAA	NDSWC 10049	100	--	--	--	11/02/1977	--		--	U	--	--	--	1425
159-077-18BBB	NDSWC 633	140	--	--	--	01/01/1952	--		--	U	--	--	--	1420
159-077-18CDD	NDSWC 10048	100	38	32	1.25	11/02/1977	4.30		12/13/1977	U	112SORV	--	--	1424
159-077-28CCC	NDSWC 10156	100	--	--	--	07/27/1978	--		--	U	--	--	--	1435
159-078-10BAD1	USDI	--	66	60	4	01/01/1953	--		--	H	112LKSD	1850	9.0	1440
159-078-10BAD2	USDI	85	--	--	--	09/ /1969	--		--	U	--	--	--	1440
159-078-10BAD3	USDI	80	--	--	--	09/ /1969	--		--	U	--	--	--	1440
159-078-14DAD	NDSWC 632	110	--	--	--	01/01/1952	--		--	U	--	--	--	1417
159-078-21AAA	NDSWC 9567	160	--	--	--	05/24/1976	--		--	U	--	--	--	1455
159-078-21ABA	NDSWC 9565	160	143	140	1.25	05/24/1976	19.25		06/23/1976	U	112SRDU	2600	--	1445
159-078-21BAB1	NDSWC 9566	160	83	80	1.25	05/24/1976	19.15		06/23/1976	U	112SRDO	1810	--	1450
159-078-21BAB2	UPHAM,ND	90	90	75	6	07/28/1976	22.00		07/28/1976	P	--	--	--	--
159-078-21B3B	UPHAM,ND	100	76	70	1.25	10/04/1977	22.23	S	10/03/1978	U	--	--	--	--
159-078-21DAA	NDSWC 625	140	--	--	--	01/01/1952	--		--	U	--	--	--	1445
159-078-21DAD	NDSWC 619	190	--	--	--	01/01/1952	--		--	U	--	--	--	1443

LOCAL NUMBER	OWNER	DEPTH DRILLED (FEET)	DEPTH OF WELL (FEET)	DEPTH TO FIRST OPENING (FEET)	CASING DIAM-ETER (INCHES)	DATE COMPLETED	WATER LEVEL (FEET)		DATE WATER LEVEL MEASURED	USE OF WATER	PRINCIPAL AQUIFER	SPECIFIC CONDUCTANCE (µMHO/CM AT 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
159-078-22AAD	NDSWC 630	90	--	--	--	01/01/1952	--		--	U	--	--	--	1452
159-078-22AAB	NDSWC 644	100	--	--	--	--	--		--	U	--	--	--	1458
159-078-22ACD	NDSWC 629	90	--	--	--	01/01/1952	--		--	U	--	--	--	1443
159-078-22BBC	NDSWC 627	90	--	--	--	01/01/1952	--		--	U	--	--	--	1445
159-078-22BCB	NDSWC 9563	100	59	56	1.25	05/21/1976	32.97		05/24/1976	U	112BRDU	5400	--	1445
159-078-22BCD1	NDSWC 625	100	--	--	--	01/01/1952	--		--	U	--	--	--	1445
159-078-22BCD2	NDSWC 626	90	--	--	--	01/01/1952	--		--	U	--	--	--	1442
159-078-22BCD3	UPHAM,ND	--	63	--	--	01/01/1953	53.03	R	07/10/1975	P	112BRDU	1750	10.0	1440
159-078-22CAC	NDSWC 620	180	--	--	--	01/01/1952	--		--	U	--	--	--	1452
159-078-22CAD	NDSWC 621	100	--	--	--	01/01/1952	--		--	U	--	--	--	1448
159-078-22CBA1	NDSWC 628	100	--	--	--	01/01/1952	--		--	U	--	--	--	1442
159-078-22CBA2	BELL, JOSEPH	63	63	--	--	09/08/1949	15.39		09/08/1949	H	--	--	--	1449
159-078-22CBC1	UPHAM SCHOOL	158	158	--	--	01/01/1949	--		--	U	--	--	--	1450
159-078-22CBC2	UPHAM SCHOOL	475	--	--	--	01/01/1949	--		--	U	--	--	--	1450
159-078-22CBC3	NDSWC 614	150	--	--	--	01/01/1952	--		--	U	--	--	--	1450
159-078-22CBC4	NDSWC 615	180	--	--	--	01/01/1952	--		--	U	--	--	--	1450
159-078-22CBC5	NDSWC 616	190	--	--	--	01/01/1952	--		--	U	--	--	--	1450
159-078-22CBD1	NDSWC 618	90	--	--	--	01/01/1952	--		--	U	--	--	--	1445
159-078-22CBD2	NDSWC 617	90	--	--	--	01/01/1952	--		--	U	--	--	--	1443
159-078-22CBD3	NDSWC 613	120	--	--	--	01/01/1952	--		--	U	--	--	--	1448
159-078-22CBD4	NDSWC 612	210	--	--	--	01/01/1952	--		--	U	--	--	--	1445
159-078-22CCB	NDSWC 9564	360	--	--	--	05/21/1976	--		--	U	--	--	--	1442
159-078-22CDA	NDSWC 622	100	--	--	--	01/01/1952	--		--	U	--	--	--	1445
159-078-22CDB1	NDSWC 624	120	--	--	--	01/01/1952	--		--	U	--	--	--	1445
159-078-22CDB2	ANDERSON, EMIL	78	--	--	--	08/31/1949	20.55		08/31/1949	U	--	--	--	1445
159-078-22DBB	NDSWC 642	90	--	--	--	01/01/1952	--		--	U	--	--	--	1440
159-078-22DCB	UPHAM,ND	90	80	--	10	--	50.47		05/20/1976	P	--	--	--	--
159-078-23BAA	NDSWC 631	60	--	--	--	01/01/1952	--		--	U	--	--	--	1425
159-078-23CBC	NDSWC 643	95	--	--	--	01/01/1952	--		--	U	--	--	--	1450
159-078-26BDC	NDSWC 636	100	--	--	--	01/01/1952	--		--	U	--	--	--	1450
159-078-26CBB	NDSWC 10047	100	--	--	--	11/02/1977	--		--	U	--	--	--	1445
159-078-28AAD	NDSWC 638	110	--	--	--	01/01/1952	--		--	U	--	--	--	1447
159-078-28ADA	NDSWC 639	80	--	--	--	01/01/1952	--		--	U	--	--	--	1428
159-078-28ADD	NDSWC 640	60	--	--	--	01/01/1952	--		--	U	--	--	--	1428
159-078-28BBB	NDSWC 641	90	--	--	--	01/01/1952	--		--	U	--	--	--	1436
159-078-28CC	PFAU, ALBERT	80	--	--	--	08/26/1976	--		--	U	--	--	--	--
159-078-34CBB	JACOBSON, J.	55	55	--	--	09/02/1949	16.20		09/02/1949	H	--	--	--	1445
159-078-35AAA	NDSWC 637	100	--	--	--	01/01/1952	--		--	U	--	--	--	1448
159-079-02CBB	BETHKE, E.	150	--	--	--	01/01/1949	--		--	U	--	--	--	1449
159-079-02DCC	MICKELSON, OLE	76	76	--	--	01/01/1909	9.60		08/19/1949	H	--	--	--	1448

LOCAL NUMBER	OWNER	DEPTH DRILLED (FEET)	DEPTH OF WELL (FEET)	DEPTH TO FIRST OPENING (FEET)	CASING DIAMETER (INCHES)	DATE COMPLETED	WATER LEVEL (FEET)		DATE WATER LEVEL MEASURED	USE OF WATER	PRINCIPAL AQUIFER	SPECIFIC CONDUCTANCE (µMHO/CM AT 25°C)	TEMPERATURE (DEGREES C)	ALTITUDE OF LAND SURFACE (FEET)
159-079-03ADA	EINARSON, EINAR	120	120	--	--	01/01/1949	22.27		08/18/1949	H	--	--	--	1451
159-079-08BAD	TORNO, VERDEEM	64	64	--	4	08/19/1974	11.80	R	07/07/1975	S	--	--	--	--
159-079-24CDD	KUTT, INGA	--	--	--	--	01/01/1950	16.40	R	07/07/1974	H	--	2200	9.0	--
159-079-24DDD	NDSWC 645	100	--	--	--	01/01/1952	--		--	U	--	--	--	1442
159-079-26ABB	AHNER, WILLIAM	54	54	--	--	01/01/1908	20.85		08/15/1949	H,S	--	--	--	1454
159-079-26BBB	NDSWC 646	100	--	--	--	01/01/1952	--		--	U	--	--	--	1446
159-079-28CCA	PFAU, ALBERT	140	140	110	4	08/22/1976	21.00		08/22/1976	H	--	--	--	1470
159-079-28CCB	PFAU, ALBERT	600	--	--	--	08/24/1976	--		--	U	--	--	--	--
159-079-28CCC	PFAU, ALBERT	170	170	140	4	08/24/1976	18.00		08/24/1976	H	--	--	--	--
159-079-28CDA	PFAU, ALBERT	180	--	--	--	08/24/1976	--		--	U	--	--	--	--
159-079-29CDC	PFAU, ALBERT	180	--	--	--	08/25/1976	--		--	U	--	--	--	--
159-079-32DDD	NDSWC 10152	140	--	--	--	07/26/1978	--		--	U	--	--	--	1450
159-079-36ABB	SCHNABEL, ROBERT	52	52	--	--	01/01/1949	18.50		08/15/1949	H	--	--	--	1454
159-080-02BCB	ZURCHER, ELMER	146	146	--	--	05/12/1972	30.00		05/12/1972	U	--	--	--	--
159-080-15DDD	WELSTAD, HAROLD	101	101	98	4	12/19/1974		P	--	H	112BRDD	2800	9.0	--
159-080-23AAA	NDSWC 5872	160	--	--	--	10/15/1970	--		--	U	--	--	--	1470
159-080-26BBB	NDSWC 10142	140	--	--	--	07/24/1978	--		--	U	--	--	--	1478
159-080-28DDD	NDSWC 10141	160	--	--	--	07/24/1978	--		--	U	--	--	--	1480
159-080-34CCC	NDSWC 10140	160	--	--	--	07/24/1978	--		--	U	--	--	--	1482
159-080-35DDD	NDSWC 10143	160	--	--	--	07/25/1978	--		--	U	--	--	--	1475
159-080-36BBB	NDSWC 10356	160	--	--	--	10/30/1978	--		--	U	--	--	--	1477
MISCELLANEOUS DATA-COLLECTION SITES														
153-079-06DD	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
153-079-07AA	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
153-080-22AAA	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
154-077-04BDB	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
154-077-10DDA	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
154-078-11BB	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
154-078-11BBC	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
154-078-12ABB	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
154-078-17CB	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
154-078-30CC	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
154-078-30CCD	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
155-077-23CC	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
155-077-23CDD	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
156-076-20CD	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
156-076-20CDC	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
157-075-19CAD	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
157-075-19DBB	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--
158-076-14DB	--	--	SURFACE WATER	--	--	--	--		--	--	--	--	--	--

TABLE 2.—Water levels in selected wells

Water levels shown have been adjusted to feet below or (+) above land surface

MP, measuring point lsd, land surface datum

Depth to water, in feet below or (+) above land surface

151-076-07DDC1 MP is top of 2-inch steel pipe 3.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 17, 1976	9.89	July 13	9.52	Aug. 9	10.77
Dec. 15	9.66	Oct. 5	10.07	Sept. 12	10.94
Apr. 26, 1977	9.35	Apr. 25, 1978	10.32	Oct. 4	11.03
May 10	9.38	May 11	10.23		
June 21	9.49	June 21	10.40		

151-076-07DDC2 MP is top of 2-inch steel pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 17, 1976	30.05	July 13	30.22	Aug. 9	29.75
Dec. 15	30.10	Oct. 5	30.42	Sept. 12	29.85
Apr. 26, 1977	30.02	Apr. 25, 1978	29.93	Oct. 4	29.93
May 10	30.07	May 11	29.76		
June 21	30.22	June 21	29.72		

151-076-07DDC3 MP is top of 2-inch steel pipe 0.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1976	33.30	June 21	33.75	June 21	33.25
Nov. 17	33.41	July 13	33.74	Aug. 9	33.30
Dec. 15	33.49	Oct. 5	33.94	Sept. 12	33.36
Apr. 26, 1977	33.57	Apr. 25, 1978	33.50	Oct. 4	33.59
May 10	33.60	May 11	33.34		

151-076-07DDC4 MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1976	36.48	June 21	36.77	June 21	36.02
Nov. 17	36.58	July 13	36.73	Aug. 9	36.11
Dec. 15	36.20	Oct. 5	36.85	Sept. 12	36.22
Apr. 26, 1977	36.65	Apr. 25, 1978	36.18	Oct. 4	36.37
May 10	36.63	May 11	36.09		

151-078-16CCB MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 29, 1977	1.88	May 10	1.03	Sept. 8	1.46
Dec. 12	1.90	June 20	.92	Sept. 11	1.16
Jan. 17, 1978	1.87	July 6	.86	Oct. 3	1.15
May 1	1.17	Aug. 9	1.08		

Depth to water, in feet below or (+) above land surface

151-078-17AAA MP is top of 1¼-inch plastic pipe 1.30 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 29, 1977	3.79	June 20	2.82	Sept. 6	3.49
Dec. 12	3.68	July 6	2.79	Sept. 11	3.80
May 10, 1978	3.55	Aug. 9	3.00	Oct. 3	3.83

151-078-21CBB1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 22, 1978	15.58	Sept. 11	15.40	Oct. 3	15.45

151-079-12BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 14, 1978	7.85	Sept. 11	8.71	Oct. 3	8.58

152-075-07BBB MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 19, 1976	22.30	July 13	23.37	Apr. 18	23.47
Nov. 17	22.55	Aug. 4	23.52	May 11	23.35
Dec. 15	22.71	Sept. 23	23.73	June 21	23.19
Jan. 18, 1977	22.80	Oct. 4	23.71	July 7	23.23
Feb. 7	22.86	Nov. 7	23.66	Aug. 9	23.29
Mar. 16	22.90	Dec. 14	23.63	Sept. 12	23.63
Apr. 7	22.92	Jan. 18, 1978	23.76	Oct. 4	23.72
May 11	23.03	Feb. 22	23.75		
June 21	23.28	Mar. 22	23.80		

152-075-09DDC MP is top of 1¼-inch plastic pipe 1.90 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Jan. 7, 1971	33.80	Apr. 2	33.04	Nov. 4	33.26
Feb. 8	33.84	May 11	32.97	Dec. 9	33.23
Mar. 8	33.86	June 4	33.65	Jan. 15, 1976	33.28
May 14	33.11	Aug. 13	33.22	Feb. 12	33.22
June 4	32.98	Sept. 10	32.65	Mar. 16	33.18
July 16	33.03	Oct. 1	33.37	Apr. 13	33.66
Aug. 5	33.18	Nov. 5	33.44	June 24	32.70
Sept. 13	33.40	Dec. 5	33.50	July 9	32.79
Oct. 4	33.52	Jan. 7, 1974	32.99	Aug. 5	33.01
Nov. 1	33.42	Feb. 6	33.50	Oct. 20	33.50
Dec. 1	33.47	Mar. 4	33.47	Nov. 15	33.59
Jan. 4, 1972	33.47	May 1	32.86	Dec. 15	33.70
Feb. 7	33.59	June 18	32.39	Jan. 18, 1977	33.78
Mar. 7	33.59	July 16	32.50	Feb. 7	33.81
Apr. 6	33.36	Aug. 5	32.70	Mar. 16	33.74
May 1	33.21	Sept. 9	32.97	Apr. 7	33.67
June 5	32.93	Sept. 30	33.11	May 11	33.63
July 11	32.87	Oct. 29	33.25	June 21	33.89
Aug. 7	32.86	Dec. 2	33.35	July 13	33.97
Sept. 5	32.96	June 18, 1975	32.64	Aug. 4	35.07
Oct. 2	33.14	July 16	32.80	Sept. 23	34.27
Nov. 8	33.15	Aug. 18	33.05	Oct. 4	34.29
Dec. 6	33.22	Sept. 10	33.19	Nov. 7	34.23
Mar. 5, 1973	33.18	Oct. 14	33.18	Dec. 14	34.31

Depth to water, in feet below or (+) above land surface

152-075-09DDC, Continued

Date	Water level	Date	Water level	Date	Water level
Jan. 18, 1978.....	34.32	May 11.....	33.74	Sept. 12.....	33.98
Feb. 22.....	34.32	June 21.....	33.63	Oct. 4.....	34.07
Mar. 23.....	34.29	July 7.....	33.67		
Apr. 18.....	33.80	Aug. 9.....	33.77		

152-075-20CCC MP is top of 1¼-inch plastic pipe 2.70 ft above lsd.

Jan.	7, 1971.....	34.49	Sept.	10.....	33.66	July	9.....	31.46
Feb.	8.....	34.29	Oct.	1.....	33.62	Aug.	5.....	31.75
Mar.	8.....	34.46	Nov.	5.....	33.80	Oct.	20.....	32.15
May	14.....	34.01	Dec.	5.....	33.75	Nov.	15.....	32.21
June	4.....	33.85	Jan.	7, 1974.....	33.74	Dec.	15.....	32.28
July	16.....	33.82	Mar.	4.....	33.61	Jan.	18, 1977.....	32.33
Aug.	5.....	33.95	May	1.....	33.45	Feb.	7.....	32.36
Sept.	13.....	33.89	June	18.....	33.00	Mar.	16.....	32.42
Oct.	4.....	33.83	July	16.....	33.09	Apr.	7.....	32.46
Nov.	1.....	33.72	Aug.	5.....	33.26	May	11.....	32.45
Dec.	1.....	33.89	Sept.	9.....	33.34	June	21.....	32.57
Jan.	4, 1972.....	33.64	Sept.	30.....	33.53	July	13.....	32.77
Feb.	7.....	33.80	Oct.	29.....	33.50	Aug.	4.....	32.97
Apr.	6.....	33.58	Dec.	2.....	33.48	Sept.	23.....	33.18
May	1.....	33.57	Mar.	12, 1975.....	33.58	Oct.	4.....	33.14
June	5.....	33.47	June	18.....	32.84	Nov.	7.....	33.12
July	11.....	33.38	July	16.....	32.10	Dec.	14.....	33.03
Aug.	7.....	33.26	Aug.	18.....	32.30	Jan.	18, 1978.....	33.21
Sept.	5.....	33.37	Sept.	10.....	32.21	Feb.	22.....	33.17
Oct.	2.....	33.35	Oct.	14.....	32.10	Mar.	22.....	33.27
Nov.	8.....	33.31	Nov.	4.....	32.21	Apr.	18.....	33.13
Dec.	6.....	33.35	Dec.	9.....	32.11	May	11.....	33.01
Mar.	5, 1973.....	33.30	Jan.	15, 1976.....	32.03	June	21.....	33.00
Apr.	2.....	33.35	Feb.	12.....	31.98	July	7.....	33.06
May	11.....	33.32	Mar.	16.....	32.02	Aug.	9.....	33.19
June	4.....	33.34	Apr.	13.....	31.89	Sept.	12.....	33.31
Aug.	13.....	33.59	June	24.....	31.46	Oct.	4.....	33.40

152-075-36BBB2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Oct.	20, 1976.....	12.07	July	13.....	12.67	June	21.....	11.90
Nov.	15.....	12.20	Sept.	23.....	13.03	Aug.	9.....	12.41
Dec.	15.....	12.35	Oct.	4.....	12.87	Sept.	12.....	12.70
May	11, 1977.....	12.12	Nov.	7.....	12.79	Oct.	4.....	12.74
June	21.....	12.50	Apr.	18, 1978.....	12.09			

152-077-30DDA1 MP is top of 2-inch steel pipe 3.50 ft above lsd.

Oct.	20, 1976.....	39.84	June	22.....	44.44	Aug.	9.....	44.30
Nov.	17.....	44.15	July	13.....	44.39	Sept.	12.....	44.37
Dec.	14.....	42.45	Oct.	5.....	44.45	Oct.	3.....	44.44
Apr.	26, 1977.....	45.76	Apr.	25, 1978.....	44.30			
May	10.....	44.35	May	11.....	44.19			

Depth to water, in feet below or (+) above land surface

152-077-30DDA2 MP is top of 2-inch steel pipe 3.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1976	45.65	June 22	44.97	Aug. 9	45.32
Nov. 17	45.37	July 13	44.70	Sept. 12	45.43
Dec. 14	45.30	Oct. 5	45.85	Oct. 3	45.52
Apr. 26, 1977	45.16	Apr. 25, 1978	45.30		
May 10	44.52	May 11	45.22		

152-077-30DDA3 MP is top of 1¼-inch plastic pipe 3.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1976	43.08	June 22	43.23	Aug. 9	43.19
Nov. 17	43.42	July 13	43.11	Sept. 12	43.27
Dec. 14	43.30	Oct. 5	43.14	Oct. 3	43.15
Apr. 26, 1977	43.18	Apr. 25, 1978	43.10		
May 10	43.17	May 11	43.00		

152-078-16CBA MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 29, 1977	4.39	Apr. 13	1.30	July 6	3.26
Dec. 12	4.52	Apr. 27	2.72	Aug. 9	4.29
Jan. 17, 1978	4.60	May 10	2.85	Sept. 11	4.82
Feb. 21	3.73	June 20	3.27	Oct. 3	4.76

152-079-08BCC MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 29, 1977	12.03	Apr. 26	10.97	Aug. 9	11.38
Dec. 12	11.83	May 10	10.72	Sept. 13	11.89
Apr. 13, 1978	11.20	June 20	10.69	Oct. 3	12.00

152-079-13DDD1 MP is top of 2-inch steel pipe 3.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 21, 1976	3.33	May 10	8.48	May 10	2.08
Nov. 15	5.65	June 22	4.44	June 20	1.28
Dec. 14	5.50	July 11	3.83	Aug. 9	2.01
Jan. 18, 1977	5.45	Aug. 5	3.64	Sept. 11	2.30
Feb. 8	5.35	Oct. 5	2.97	Oct. 3	2.35
Apr. 26	8.40	Apr. 13, 1978	2.27		

152-079-13DDD2 MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 20, 1976	13.21	May 10	13.77	May 10	14.05
Oct. 27	13.50	June 22	13.80	June 20	14.00
Nov. 15	13.42	July 11	13.86	Aug. 9	14.00
Dec. 14	13.40	Aug. 5	14.15	Sept. 11	14.12
Jan. 18, 1977	13.52	Oct. 5	14.17	Oct. 3	14.14
Feb. 8	13.51	Apr. 13, 1978	14.23		

Depth to water, in feet below or (+) above land surface

152-079-13DDD3 MP is top of 2-inch steel pipe 4.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 21, 1976	11.25	May 10	11.45	May 10	11.06
Nov. 15	11.33	June 22	11.32	June 28	11.25
Dec. 14	11.26	July 11	11.33	Aug. 9	11.28
Jan. 18, 1977	11.23	Aug. 5	11.57	Sept. 11	11.36
Feb. 8	11.23	Oct. 5	11.42	Oct. 3	11.40
Apr. 26	10.48	Apr. 13, 1978	11.17		

153-076-03DDD MP is top of 1¼-inch plastic pipe 1.00 ft above lsd.

June 24, 1976	2.80	Nov. 15	8.27	Nov. 7	8.24
July 8	6.05	Dec. 14	8.45	May 10, 1978	7.20
Aug. 5	6.99	Jan. 18, 1977	8.66		
Oct. 19	8.10	May 11	8.75		

153-076-05DDD MP is top of 1¼-inch plastic pipe 2.20 ft above lsd.

Jan. 7, 1971	5.34	Aug. 10	5.60	June 24	4.81
Feb. 8	5.27	Oct. 1	5.54	July 8	4.98
Mar. 8	5.30	Nov. 5	5.65	Aug. 5	5.65
May 18	5.20	Dec. 5	4.95	Oct. 19	5.44
June 4	5.19	Jan. 7, 1974	5.70	Nov. 15	5.33
July 16	5.26	Feb. 6	5.54	Dec. 14	5.24
Aug. 5	5.39	Mar. 4	5.42	Jan. 18, 1977	5.19
Sept. 13	5.28	May 1	5.37	Mar. 16	5.21
Oct. 4	5.25	June 18	5.21	Apr. 7	5.23
Nov. 1	5.10	July 16	5.35	May 10	5.23
Dec. 1	5.22	Aug. 5	5.50	June 22	5.70
Jan. 4, 1972	5.15	Sept. 9	5.53	July 11	6.00
Feb. 7	5.17	Sept. 30	5.58	Aug. 4	6.65
Mar. 7	5.08	Oct. 29	5.54	Sept. 22	6.66
Apr. 6	5.01	Dec. 2	5.58	Oct. 5	6.42
May 1	5.07	Mar. 12, 1975	5.53	Nov. 7	6.07
June 5	5.13	June 18	4.90	Dec. 12	5.75
July 11	5.17	July 16	4.63	Jan. 18, 1978	5.70
Aug. 7	5.09	Aug. 11	4.70	Feb. 22	5.59
Sept. 5	5.19	Sept. 10	4.70	Mar. 23	5.65
Oct. 2	5.17	Oct. 14	4.49	Apr. 13	5.55
Nov. 8	5.14	Nov. 4	4.53	May 10	5.38
Dec. 6	5.22	Dec. 9	4.43	June 20	5.72
Mar. 5, 1973	5.12	Jan. 14, 1976	4.38	July 6	6.03
Apr. 2	5.24	Feb. 12	4.24	Aug. 1	6.69
May 11	5.26	Mar. 15	4.28	Sept. 11	6.81
June 4	5.29	Apr. 13	4.27	Oct. 4	6.60
June 13	5.60	May 20	4.55		

Depth to water, in feet below or (+) above land surface

153-076-08DCD MP is top of 1¼-inch plastic pipe 1.90 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Jan. 7, 1971	19.35	Oct. 1	19.63	July 8	17.59
Feb. 8	19.50	Nov. 5	19.73	Aug. 5	18.01
Mar. 8	19.51	Dec. 6	19.70	Oct. 19	18.49
May 18	18.90	Jan. 7, 1974	19.80	Nov. 15	18.46
June 4	18.50	Feb. 6	20.00	Dec. 14	18.56
July 16	18.89	Mar. 4	19.90	Jan. 18, 1977	18.75
Aug. 5	19.11	Apr. 3	19.93	Feb. 7	18.78
Sept. 13	19.17	May 1	19.31	Mar. 16	18.81
Oct. 4	19.18	June 18	18.64	Apr. 7	18.82
Nov. 1	18.94	July 16	18.82	May 10	18.68
Dec. 1	18.96	Aug. 5	19.10	June 22	18.89
Jan. 4, 1972	19.07	Sept. 9	19.39	July 11	18.85
Feb. 7	19.33	Sept. 30	19.55	Aug. 4	19.09
Mar. 7	19.39	Oct. 29	19.56	Sept. 22	19.17
Apr. 6	19.27	Dec. 2	19.65	Oct. 5	19.04
May 1	19.08	Mar. 12, 1975	19.39	Nov. 7	18.90
June 5	18.83	July 16	17.37	Dec. 12	18.88
July 11	18.77	Aug. 11	18.08	Jan. 18, 1978	19.17
Aug. 7	18.79	Aug. 18	18.16	Feb. 22	19.14
Sept. 5	18.89	Sept. 10	18.14	Mar. 23	19.25
Oct. 2	18.94	Oct. 14	17.91	Apr. 13	18.85
Nov. 8	18.93	Nov. 4	17.96	May 10	18.50
Dec. 6	18.98	Dec. 9	17.93	June 20	18.44
Mar. 5, 1973	18.29	Jan. 14, 1976	18.15	July 6	18.42
Apr. 2	19.24	Feb. 12	18.08	Aug. 1	18.66
May 11	19.08	Mar. 15	18.13	Sept. 11	18.85
June 4	18.06	Apr. 13	17.59	Oct. 4	19.00
Aug. 13	19.62	May 20	17.35		
Sept. 10	19.67	June 24	17.45		

153-076-12DDD1 MP is top of 2-inch steel pipe 2.00 ft above lsd.

Oct. 19, 1976	1.01	July 13	1.55	May 11	1.22
Oct. 20	1.01	Aug. 4	1.68	June 21	.52
Nov. 15	1.14	Sept. 23	2.00	July 7	.52
Dec. 15	1.37	Oct. 4	1.90	Aug. 1	.77
Mar. 16, 1977	1.86	Nov. 7	1.73	Sept. 12	1.35
Apr. 7	1.61	Dec. 14	1.83	Oct. 4	1.49
May 11	1.18	Mar. 22, 1978	2.28		
June 21	1.50	Apr. 18	1.58		

153-076-12DDD2 MP is top of 1¼-inch plastic pipe 1.00 ft above lsd.

Oct. 19, 1976	8.69	June 21	9.39	Apr. 18	8.39
Oct. 20	8.65	July 13	9.30	May 11	8.22
Nov. 15	8.83	Aug. 4	9.54	June 21	7.89
Dec. 15	9.01	Sept. 23	9.80	July 7	8.02
Jan. 18, 1977	9.18	Oct. 4	9.46	Aug. 1	8.45
Feb. 7	9.25	Nov. 7	9.25	Sept. 12	9.24
Mar. 16	8.99	Dec. 14	9.35	Oct. 4	9.37
Apr. 7	8.93	Jan. 18, 1978	9.55		
May 11	9.00	Mar. 22	9.65		

Depth to water, in feet below or (+) above land surface

153-076-13DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 19, 1976	9.70	June 21	10.35	May 11	8.84
Oct. 20	9.77	July 13	9.90	June 21	8.45
Nov. 15	9.76	Aug. 4	10.54	July 7	8.77
Dec. 15	9.96	Sept. 23	10.84	Aug. 1	9.49
Feb. 7, 1977	10.33	Oct. 4	10.19	Sept. 12	10.27
Apr. 7	9.95	Nov. 7	10.10	Oct. 4	10.28
May 11	10.00	Apr. 18, 1978	9.44		

153-076-25AAA1 MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 19, 1976	12.83	June 21	13.78	Mar. 22	14.43
Oct. 20	12.93	July 13	13.76	Apr. 18	13.29
Nov. 15	12.96	Aug. 4	13.87	May 11	12.79
Dec. 15	13.15	Sept. 23	14.19	June 21	12.06
Jan. 18, 1977	13.47	Oct. 4	13.90	July 7	12.30
Feb. 7	13.54	Nov. 7	13.61	Aug. 1	12.62
Mar. 16	13.53	Dec. 14	13.66	Sept. 12	13.36
Apr. 7	13.41	Jan. 18, 1978	14.04	Oct. 4	13.49
May 11	13.30	Feb. 22	14.25		

153-077-02ADD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
May 23, 1978	23.45	Aug. 8	24.75	Oct. 4	23.98
June 20	23.65	Sept. 11	25.19	Nov. 11	23.90

153-077-02CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 18, 1975	10.49	May 20	9.84	Sept. 22	12.04
Sept. 9	9.69	June 22	10.09	Oct. 5	11.86
Oct. 10	9.50	July 8	10.23	Nov. 7	11.66
Dec. 9	9.71	Aug. 5	10.67	Dec. 12	11.58
Jan. 14, 1976	10.00	Oct. 19	10.98	Apr. 13, 1978	11.45
Feb. 12	9.99	Nov. 15	10.97	May 10	11.40
Mar. 15	10.02	Dec. 14	11.04	June 20	11.69
Apr. 13	9.49	Jan. 18, 1977	11.17	July 6	12.12
Apr. 19	9.39	Feb. 7	11.21	Aug. 8	12.69
Apr. 20	9.24	May 10	11.15	Sept. 11	13.18
Apr. 22	9.28	June 22	11.33	Oct. 4	12.17
Apr. 23	9.30	July 11	12.13	Nov. 11	12.10

153-079-30AAA1 MP is top of 2-inch steel pipe 0.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 15, 1976	39.20	Apr. 27	34.05	May 10	34.05
Dec. 14	38.33	June 22	32.30	June 20	34.27
Jan. 18, 1977	37.80	July 11	34.57	Aug. 8	34.40
Feb. 8	37.86	Oct. 5	34.53	Sept. 13	34.39
Mar. 15	34.40	Mar. 22, 1978	34.24	Oct. 3	34.43
Apr. 5	34.14	Apr. 13	34.22		

Depth to water, in feet below or (+) above land surface

153-079-30AAA2 MP is top of 2-inch steel pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 26, 1976	27.92	Apr. 5	17.88	May 10	17.27
Oct. 27	41.44	Apr. 27	17.58	June 20	17.53
Nov. 15	34.68	June 22	17.89	Aug. 8	17.90
Dec. 14	33.55	July 11	17.78	Sept. 13	17.70
Jan. 18, 1977	31.49	Oct. 5	17.97	Oct. 3	17.77
Feb. 8	28.79	Mar. 22, 1978	17.67		
Mar. 15	20.70	Apr. 13	17.49		

153-079-30AAA3 MP is top of 1¼-inch plastic pipe 3.00 ft above lsd.

Oct.	26, 1976	47.35	Mar.	15	62.78	Apr.	13	62.83
Oct.	27	63.40	Apr.	5	62.85	May	10	62.66
Nov.	15	62.96	June	22	62.85	June	20	62.87
Dec.	14	62.82	July	11	62.73	Aug.	8	62.50
Jan.	18, 1977	63.07	Oct.	5	63.03	Sept.	13	62.79
Feb.	8	62.95	Mar.	22, 1978	62.89	Oct.	3	62.98

153-080-14BBB MP is top of 1¼-inch plastic pipe 2.10 ft above lsd.

Feb.	9, 1971	63.33	Sept.	28	63.64	Aug.	10	62.70
Mar.	8	63.43	Oct.	31	63.53	Sept.	12	62.90
May	13	63.34	Dec.	5	64.90	Oct.	19	62.43
June	7	63.67	Jan.	2, 1974	63.73	Nov.	15	62.60
Aug.	2	63.48	Jan.	30	63.90	Dec.	14	62.70
Sept.	13	63.08	Mar.	7	63.98	Jan.	18, 1977	62.38
Oct.	4	63.58	Mar.	18	63.81	Feb.	8	62.69
Nov.	3	63.63	Apr.	29	63.95	Mar.	15	62.89
Dec.	1	63.57	June	20	63.66	Apr.	5	62.79
Jan.	4, 1972	62.98	Aug.	13	63.57	May	10	62.68
Feb.	10	63.30	Sept.	10	63.29	June	22	62.82
Mar.	7	63.79	Oct.	15	63.38	July	11	62.70
Apr.	6	63.33	Nov.	7	63.42	Aug.	5	63.04
May	5	63.40	Dec.	2	63.54	Sept.	22	63.06
June	9	63.58	Mar.	12, 1975	63.54	Oct.	4	63.13
July	11	63.46	July	17	63.25	Nov.	10	63.10
Aug.	7	63.31	Aug.	14	63.21	Dec.	12	62.97
Sept.	5	63.09	Sept.	9	63.08	Jan.	17, 1978	62.92
Oct.	2	63.52	Oct.	10	63.13	Feb.	21	63.04
Nov.	8	63.08	Nov.	4	63.16	Mar.	22	63.38
Dec.	6	63.54	Dec.	9	62.73	Apr.	13	63.43
Mar.	14, 1973	63.44	Jan.	15, 1976	62.93	May	10	62.99
Apr.	4	63.43	Feb.	12	63.08	June	20	63.36
May	4	63.33	Mar.	16	62.85	July	6	63.28
May	30	63.47	Apr.	13	62.60	Aug.	1	63.38
June	27	63.58	May	20	62.91	Sept.	13	63.32
Aug.	8	63.58	June	25	62.63	Oct.	3	63.32
Aug.	29	63.63	July	8	62.53			

Depth to water, in feet below or (+) above land surface

154-075-04AAA1 MP is top of 2-inch steel pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 2, 1976	6.27	June 21	6.41	Apr. 18	6.51
Nov. 15	6.34	July 13	6.57	May 11	5.86
Dec. 15	6.40	Aug. 4	6.92	June 21	5.63
Jan. 19, 1977	6.55	Sept. 23	7.20	July 7	5.78
Feb. 7	6.75	Oct. 4	7.02	Aug. 1	6.02
Mar. 16	6.73	Dec. 13	6.43	Sept. 12	6.57
Apr. 7	5.56	Feb. 22, 1978	6.90	Oct. 4	6.78
May 11	6.22	Mar. 23	7.16		

154-075-04AAA2 MP is top of 1¼-inch plastic pipe 1.00 ft above lsd.

Nov.	2, 1976	5.90	June	21	6.02	Apr.	18	4.30
Nov.	15	5.95	July	13	6.23	May	11	4.00
Dec.	15	6.06	Aug.	4	6.62	June	21	4.68
Jan.	19, 1977	6.26	Sept.	23	6.82	July	7	5.04
Feb.	7	6.34	Oct.	4	5.72	Aug.	1	5.50
Mar.	16	5.69	Dec.	14	5.79	Sept.	12	6.29
Apr.	7	5.45	Feb.	22, 1978	6.77	Oct.	4	6.45
May	11	5.30	Mar.	23	6.57			

154-075-21CDD1 MP is top of 2-inch steel pipe 2.00 ft above lsd.

Oct.	19, 1976	13.65	May	11	14.82	Mar.	22	15.80
Oct.	20	14.08	June	21	15.19	Apr.	18	15.73
Nov.	15	13.90	July	13	15.21	May	11	15.52
Dec.	15	14.00	Aug.	4	15.49	June	21	15.70
Jan.	19, 1977	14.11	Sept.	23	15.53	July	7	15.72
Feb.	7	14.27	Oct.	4	15.47	Aug.	1	15.40
Mar.	16	14.41	Dec.	14	15.38	Sept.	12	15.97
Apr.	7	14.46	Feb.	22, 1978	15.67	Oct.	4	15.04

154-075-21CDD2 MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Oct.	19, 1976	9.60	May	11	7.56	Mar.	22	9.09
Oct.	20	6.50	June	21	7.85	Apr.	18	8.63
Nov.	15	6.58	July	13	7.93	May	11	8.36
Dec.	15	6.80	Aug.	4	8.16	June	21	8.32
Jan.	19, 1977	7.07	Sept.	23	8.44	July	7	8.32
Feb.	7	7.27	Oct.	4	8.40	Aug.	1	8.40
Mar.	16	7.47	Dec.	14	8.40	Sept.	12	8.86
Apr.	7	7.52	Feb.	22, 1978	8.94	Oct.	4	9.00

154-075-30DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Oct.	19, 1976	15.64	May	11	16.35	Apr.	18, 1978	17.19
Oct.	20	17.15	June	21	16.67	May	11	16.70
Nov.	15	15.73	July	13	16.76	Aug.	1	17.07
Dec.	15	15.93	Aug.	4	16.90	Sept.	12	17.50
Apr.	7, 1977	16.37	Oct.	4	17.20			

Depth to water, in feet below or (+) above land surface

154-076-04CCC MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Dec. 12, 1977	3.47	June 20	2.63	Sept. 11	3.97
May 10, 1978	1.36	July 6	2.70	Oct. 5	4.08
May 16	1.79	Aug. 1	3.30		

154-076-21CCC MP is top of 1¼-inch plastic pipe 1.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
May 20, 1976	3.92	Mar. 16	7.35	Feb. 22, 1978	7.89
June 23	5.11	Apr. 7	7.30	Mar. 21	7.96
July 8	5.44	May 11	7.29	Apr. 13	6.75
Aug. 5	6.24	June 22	7.68	May 10	6.56
Oct. 19	7.04	July 11	7.47	June 20	6.70
Nov. 3	7.10	Aug. 4	7.50	July 6	6.86
Dec. 14	7.20	Sept. 22	7.90	Aug. 1	7.21
Jan. 19, 1977	7.32	Oct. 5	7.75	Sept. 11	7.74
Feb. 7	7.42	Dec. 12	7.54	Oct. 3	7.82

154-077-07DDD MP is top of 1¼-inch plastic pipe 1.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
June 22, 1976	52.88	Dec. 14	52.62	Oct. 5	52.59
July 8	52.67	May 10, 1977	52.57	May 10, 1978	52.42
Aug. 5	52.69	June 22	52.48	Aug. 8	52.40
Oct. 19	52.60	July 11	52.58	Nov. 11	52.48
Nov. 15	52.59	Aug. 4	52.57		

154-077-17CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
May 19, 1976	51.28	Apr. 5	52.08	Mar. 21	54.05
June 22	51.42	May 10	52.10	Apr. 12	53.86
July 8	51.49	June 22	52.31	May 10	54.35
July 22	51.66	July 11	54.03	June 20	54.77
Aug. 5	51.82	July 26	55.87	July 6	55.78
Oct. 19	51.90	Aug. 4	55.34	Aug. 8	55.20
Nov. 15	51.85	Sept. 22	53.22	Sept. 11	56.17
Dec. 14	51.86	Oct. 5	53.16	Oct. 4	53.88
Jan. 18, 1977	52.16	Nov. 7	52.95	Nov. 11	54.03
Feb. 7	51.99	Dec. 12	52.88		
Mar. 15	52.07	Jan. 17, 1978	52.99		

Depth to water, in feet below or (+) above land surface

154-077-18CCC MP is top of 4-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
May 20, 1976	53.07	July 26	56.32	Apr. 5	54.98
May 25	52.96	July 31	56.52	Apr. 10	54.85
June 22	53.13	Aug. 2	56.72	Apr. 12	54.77
June 24	53.12	Aug. 5	56.12	Apr. 15	54.91
June 29	53.21	Aug. 10	56.20	Apr. 20	54.78
July 8	53.12	Aug. 15	55.75	Apr. 25	54.87
July 15	53.37	Aug. 20	55.51	Apr. 30	54.80
July 22	55.49	Aug. 24	56.30	May 5	54.84
Aug. 5	53.60	Aug. 25	56.15	May 10	55.03
Sept. 7	53.76	Aug. 28	56.22	May 15	54.85
Sept. 10	53.64	Aug. 31	55.72	May 20	55.30
Sept. 15	53.75	Sept. 5	55.20	May 25	55.08
Sept. 20	53.66	Sept. 22	55.00	May 31	54.92
Sept. 25	53.75	Sept. 25	54.91	June 5	54.90
Sept. 30	53.72	Sept. 30	54.82	June 10	55.25
Oct. 5	53.80	Oct. 5	54.89	June 20	55.47
Oct. 19	53.69	Oct. 10	54.96	June 25	55.67
Nov. 15	53.62	Oct. 15	55.00	June 30	56.12
Nov. 20	53.74	Oct. 20	54.92	July 5	56.34
Nov. 25	53.61	Oct. 25	54.84	July 10	55.75
Nov. 30	53.69	Oct. 31	54.80	July 15	56.47
Dec. 5	53.62	Nov. 5	55.07	July 20	56.15
Dec. 10	53.73	Nov. 10	54.95	July 25	56.71
Dec. 14	53.65	Dec. 12	54.70	July 31	56.29
Jan. 18, 1977	53.75	Dec. 20	54.74	Aug. 5	56.85
Feb. 7	53.70	Dec. 25	54.72	Aug. 10	56.50
Mar. 15	53.75	Dec. 30	54.73	Aug. 15	57.17
Apr. 5	53.90	Jan. 5, 1978	54.78	Aug. 20	57.50
Apr. 10	53.91	Jan. 10	54.84	Aug. 25	57.33
Apr. 15	53.92	Jan. 15	54.88	Aug. 31	58.62
Apr. 20	53.95	Feb. 21	54.86	Sept. 5	58.68
Apr. 25	54.00	Feb. 25	55.01	Sept. 10	57.15
Apr. 30	53.92	Feb. 28	54.96	Sept. 15	57.75
May 10	53.83	Mar. 5	54.85	Sept. 20	56.34
June 22	54.10	Mar. 10	54.86	Sept. 25	56.04
July 11	55.09	Mar. 15	55.01	Sept. 30	56.01
July 15	54.88	Mar. 20	54.91	Oct. 5	56.00
July 20	55.70	Mar. 25	55.00	Nov. 14	55.87
July 25	56.27	Mar. 31	54.84		

154-077-27ADD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

May	11, 1976	13.63	July	1	14.80	Aug.	13	18.32
May	20	13.67	July	3	13.60	Aug.	30	13.51
May	25	15.64	July	6	12.23	Sept.	7	12.01
June	22	14.46	July	8	14.10	Oct.	6	10.44
June	23	13.79	July	15	18.11	Nov.	15	9.85
June	24	13.40	July	22	22.46	Dec.	14	9.66
June	25	12.62	July	23	19.95	Jan.	18, 1977	9.53
June	26	12.16	July	26	24.16	Feb.	7	9.43
June	27	11.79	July	29	23.90	Mar.	15	9.38
June	28	13.92	Aug.	5	19.00	Apr.	5	9.45
June	29	13.97	Aug.	9	20.76	May	10	10.71
June	30	13.66	Aug.	10	24.28	June	22	18.53

Depth to water, in feet below or (+) above land surface

154-077-27ADD, Continued

Date	Water level	Date	Water level	Date	Water level
July 11, 1977	21.14	Dec. 12	10.60	July 6	18.00
July 26	27.75	Mar. 21, 1978	10.09	Aug. 9	22.03
Aug. 4	26.46	Apr. 12	9.94	Sept. 11	13.58
Sept. 22	12.94	May 10	9.84	Oct. 4	11.89
Oct. 5	12.07	May 16	9.92		
Nov. 7	11.13	June 20	12.63		

154-077-27CDD MP is top of 1¼-inch plastic pipe 2.10 ft above lsd.

Sept.	9, 1975	10.07	July	6	10.04	Sept.	22	11.62
Oct.	14	9.98	July	15	10.15	Oct.	5	11.50
Nov.	3	10.10	July	22	10.21	Nov.	7	11.32
Nov.	4	10.06	Aug.	5	10.32	Dec.	12	11.21
Nov.	13	10.04	Oct.	6	10.40	Jan.	17, 1978	11.21
Dec.	9	10.00	Nov.	15	10.35	Feb.	21	11.20
Jan.	14, 1976	10.07	Dec.	14	10.35	Mar.	21	11.17
Feb.	12	10.02	Jan.	18, 1977	10.41	Apr.	12	11.00
Mar.	15	10.05	Feb.	7	10.43	May	10	11.47
Apr.	12	9.75	Mar.	15	10.46	May	16	12.92
Apr.	14	9.74	Apr.	5	10.49	June	20	11.85
Apr.	20	9.70	May	10	10.57	July	6	12.77
May	10	9.76	June	22	10.74	Aug.	8	13.27
May	20	9.79	July	11	12.60	Sept.	11	14.69
May	25	9.77	July	26	15.30	Oct.	4	12.02
June	22	9.95	Aug.	4	13.70			

154-077-27DBB MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

May	13, 1976	1.54	Nov.	15	1.54	Sept.	22	3.36
May	20	1.85	Dec.	14	1.49	Oct.	5	3.05
May	25	2.20	May	10, 1977	1.78	May	10, 1978	2.69
June	22	2.23	June	22	3.47	May	16	2.87
July	6	2.63	July	11	5.55	June	20	3.71
Aug.	5	3.21	July	26	8.40	Aug.	7	6.78
Oct.	6	1.72	Aug.	4	7.98	Oct.	3	3.50

154-077-28ADD1 MP is top of 1¼-inch plastic pipe 3.00 ft above lsd.

May	20, 1976	14.84	Apr.	5	15.64	Mar.	21	16.47
June	22	15.01	May	10	15.73	Apr.	12	16.28
July	6	15.14	June	22	15.95	May	10	16.82
July	15	15.25	July	11	17.98	May	16	19.57
July	22	15.32	July	26	22.26	June	20	17.30
Aug.	5	15.44	Aug.	4	19.12	July	6	18.27
Oct.	19	15.51	Sept.	22	16.82	Aug.	8	21.42
Nov.	15	15.49	Oct.	5	16.69	Sept.	11	21.39
Dec.	14	15.48	Nov.	7	16.57	Oct.	4	17.34
Jan.	18, 1977	15.56	Dec.	12	16.45	Nov.	1	17.11
Feb.	7	15.57	Jan.	17, 1978	16.48			
Mar.	15	15.62	Feb.	21	16.50			

Depth to water, in feet below or (+) above land surface

154-077-29BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
May 19, 1976	24.71	Apr. 5	25.51	Feb. 21	26.49
June 22	24.85	May 10	25.56	Mar. 21	26.49
July 8	24.91	June 22	25.77	Apr. 12	26.30
July 22	25.09	July 11	27.49	May 10	26.77
Aug. 5	25.25	July 26	29.50	June 20	27.17
Oct. 19	25.33	Aug. 4	28.74	July 6	28.20
Nov. 15	25.29	Sept. 22	26.70	Aug. 8	27.68
Dec. 14	25.29	Oct. 5	26.59	Sept. 11	29.57
Jan. 18, 1977	25.39	Nov. 7	26.46	Oct. 4	27.41
Feb. 7	25.42	Dec. 12	26.35	Nov. 11	27.44
Mar. 15	25.49	Jan. 17, 1978	26.42		

154-077-29CCC MP is top of 1¼-inch plastic pipe 1.40 ft above lsd.

Aug. 12, 1975	16.02	Oct. 19	15.64	Nov. 7	16.80
Sept. 9	15.67	Nov. 15	15.60	Dec. 12	16.64
Oct. 14	15.46	Dec. 14	15.59	Jan. 17, 1978	16.69
Nov. 3	15.49	Jan. 18, 1977	15.62	Feb. 21	16.74
Dec. 9	15.41	Feb. 7	15.65	Mar. 21	16.74
Jan. 14, 1976	15.38	Mar. 15	15.72	Apr. 13	16.74
Feb. 12	15.29	Apr. 5	15.74	May 10	16.65
Mar. 15	15.30	May 10	15.74	June 20	17.09
Apr. 13	15.20	June 22	15.90	July 6	17.39
May 20	15.13	July 11	16.30	Aug. 8	18.24
June 22	15.23	July 26	16.98	Sept. 11	18.69
July 8	15.29	Aug. 4	17.31	Oct. 4	18.20
July 22	15.38	Sept. 22	17.16	Nov. 11	17.95
Aug. 5	15.50	Oct. 5	16.97		

154-077-30CBB MP is top of 2-inch steel pipe 1.19 ft above lsd.

Sept. 10, 1975	20.39	June 22	19.83	Apr. 5	20.72
Oct. 14	20.27	July 8	19.99	May 10	20.96
Nov. 3	20.22	Aug. 5	20.40	June 22	21.22
Dec. 9	20.15	Oct. 19	20.49	July 11	21.57
Jan. 14, 1976	20.20	Nov. 15	20.51	Aug. 4	22.02
Feb. 12	20.16	Dec. 14	20.55	Sept. 22	22.01
Mar. 15	20.18	Jan. 18, 1977	20.59	Oct. 5	21.98
Apr. 13	19.36	Feb. 7	20.65	Nov. 7	21.94
May 20	19.55	Mar. 15	20.71		

Depth to water, in feet below or (+) above land surface

154-077-30DDC MP is top of 2-inch steel pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 10, 1975	12.11	Aug. 25	11.97	June 22	13.30
Oct. 14	11.95	Aug. 30	12.04	July 11	13.53
Nov. 3	11.91	Sept. 2	11.98	July 26	13.79
Dec. 9	11.82	Sept. 7	12.05	Aug. 4	13.90
Jan. 14, 1976	11.90	Sept. 10	12.03	Sept. 22	13.97
Feb. 12	11.91	Sept. 15	12.10	Oct. 5	13.95
Mar. 15	12.01	Oct. 6	12.33	Nov. 7	13.90
Apr. 13	11.33	Nov. 15	12.43	Dec. 12	13.90
May 20	11.23	Dec. 14	12.52	Mar. 21, 1978	14.15
June 22	11.50	Jan. 18, 1977	12.62	Apr. 12	13.84
July 8	11.63	Feb. 7	12.68	May 10	13.75
July 22	11.82	Mar. 15	12.80	June 20	13.86
Aug. 5	11.95	Apr. 5	12.85	Sept. 11	15.17
Aug. 20	11.94	May 10	13.03		

154-077-32DAD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

May 20, 1976	7.86	Mar. 15, 1977	9.63	Nov. 7	10.30
June 22	8.08	Apr. 5	9.64	Apr. 13, 1978	10.15
July 6	8.19	May 10	9.58	May 10	9.89
July 22	8.38	June 22	9.79	June 20	9.96
Aug. 5	8.57	July 11	9.90	Aug. 8	10.30
Oct. 6	9.10	Aug. 4	10.26	Sept. 11	10.55
Nov. 15	9.17	Sept. 22	10.40	Oct. 4	10.52
Dec. 14	9.29	Oct. 5	10.29	Nov. 11	10.60

154-077-32DCC MP is top of 2-inch steel pipe 1.80 ft above lsd.

Sept. 9, 1975	13.79	Aug. 18	14.21	May 10	15.02
Oct. 14	13.55	Aug. 20	14.25	June 22	15.28
Nov. 4	13.56	Aug. 25	14.30	July 11	15.52
Dec. 9	13.55	Aug. 30	14.35	Aug. 4	15.72
Jan. 14, 1976	13.69	Sept. 3	14.38	Sept. 22	15.77
Feb. 12	13.77	Sept. 7	14.49	Oct. 5	15.75
Mar. 15	13.86	Sept. 10	14.53	Nov. 7	15.74
Apr. 13	13.29	Sept. 15	14.54	Dec. 12	15.77
May 20	13.25	Oct. 6	14.52	Jan. 1, 1978	15.83
June 22	13.30	Nov. 15	14.49	Feb. 21	15.95
July 6	13.49	Dec. 14	14.57	Mar. 12	15.62
July 22	13.81	Jan. 18, 1977	14.71	May 10	15.48
Aug. 5	14.00	Feb. 7	14.74	Sept. 11	16.18
Aug. 13	14.15	Mar. 15	14.80		
Aug. 15	14.18	Apr. 5	14.86		

Depth to water, in feet below or (+) above land surface

154-077-35BAB MP is top of 1¼-inch steel pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Apr. 12, 1976	12.13	Aug. 5	13.78	Oct. 5	14.48
Apr. 13	12.76	Aug. 9	14.49	Nov. 7	14.40
Apr. 14	12.40	Oct. 6	13.00	Dec. 12	14.44
Apr. 19	12.27	Nov. 15	13.13	Mar. 21, 1978	14.87
Apr. 20	12.20	Dec. 14	13.28	Apr. 12	14.50
May 11	12.62	Mar. 3, 1977	13.78	May 10	14.25
May 25	12.77	Apr. 5	13.84	June 20	14.40
June 22	12.96	May 10	14.07	July 6	15.05
June 29	12.69	June 22	14.90	Aug. 22	15.16
July 6	13.14	July 11	15.56	Sept. 11	14.60
July 15	13.44	July 26	16.48	Oct. 4	14.46
July 22	14.12	Aug. 4	16.07	Nov. 11	14.60
July 29	14.55	Sept. 22	14.53		

154-077-35BBB2 MP is top of 1¼-inch plastic pipe 1.40 ft above lsd.

Aug.	12, 1975	8.95	May	25	21.83	July	11	19.10
Sept.	9	8.78	May	27	31.83	July	26	56.08
Oct.	14	8.67	June	15	12.65	Aug.	4	30.30
Nov.	3	20.04	June	22	12.72	Sept.	22	12.20
Nov.	4	14.36	July	6	18.20	Oct.	5	11.74
Nov.	13	8.99	July	8	12.45	Nov.	7	11.13
Dec.	9	11.81	July	15	19.57	Dec.	12	10.87
Jan.	14, 1976	8.85	July	22	27.00	Jan.	17, 1978	10.82
Feb.	12	8.86	July	29	38.72	Feb.	21	10.82
Mar.	15	8.93	Aug.	5	19.36	Mar.	21	10.80
Apr.	12	8.30	Aug.	9	48.89	Apr.	12	10.38
Apr.	12	8.95	Oct.	6	10.23	May	10	10.20
Apr.	13	12.19	Nov.	15	9.95	May	16	10.22
Apr.	14	12.64	Dec.	14	9.95	June	20	11.80
Apr.	20	8.88	Jan.	18, 1977	9.98	July	6	16.46
Apr.	30	9.67	Feb.	7	9.99	Aug.	8	22.79
May	10	20.20	Mar.	15	10.04	Sept.	11	12.57
May	11	26.90	Apr.	5	10.06	Oct.	4	11.50
May	19	13.19	May	10	10.81	Nov.	11	11.27
May	20	17.41	June	22	30.40			

154-077-35BCA1 MP is top of 1¼-inch plastic pipe 2.60 ft above lsd.

Aug.	11, 1975	16.21	Nov.	4	21.00	Apr.	14	19.13
Sept.	9	15.60	Nov.	13	15.74	Apr.	20	15.53
Sept.	10	15.61	Dec.	9	18.42	May	25	27.15
Oct.	30	15.57	Mar.	15, 1976	15.89	June	22	18.45
Nov.	3	22.64	Apr.	12	16.56	Oct.	6	16.93

Depth to water, in feet below or (+) above land surface

154-077-35BCA3 MP is top of 1¼-inch steel pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Apr. 12, 1976	15.41	July 22	31.80	July 11	25.00
Apr. 13	18.10	July 29	68.40	July 26	88.37
Apr. 14	19.42	Aug. 5	24.72	Aug. 4	35.65
Apr. 15	23.17	Aug. 9	83.80	Sept. 22	19.06
Apr. 19	16.09	Oct. 6	17.18	Oct. 5	18.71
Apr. 20	15.80	Nov. 15	17.03	Nov. 7	18.22
May 25	27.34	Dec. 14	17.08	Apr. 12, 1978	17.66
June 22	18.63	Mar. 15, 1977	17.27	May 10	17.42
June 28	59.48	Apr. 5	17.27	July 6	22.30
July 6	23.82	Apr. 10	17.82	Nov. 11	18.33
July 15	24.82	June 22	37.08		

154-077-35BDD MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Aug. 11, 1975	15.43	Dec. 9	17.95	July 6	22.24
Sept. 9	15.48	Apr. 12, 1976	15.73	Aug. 5	23.20
Oct. 14	15.41	Apr. 14	18.55	Oct. 6	16.75
Oct. 30	15.47	Apr. 20	15.25	Nov. 15	16.60
Nov. 3	21.90	May 25	24.98	Dec. 14	16.65
Nov. 4	20.28	June 22	18.03		
Nov. 13	15.56	June 28	26.75		

154-078-10ADD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Nov. 29, 1977	8.79	May 10	7.28	Sept. 11	8.02
Apr. 12, 1978	7.29	June 20	7.51	Oct. 4	8.37
Apr. 26	7.58	Aug. 8	7.45		

154-078-14CCC MP is top of 1¼-inch plastic pipe 2.10 ft above lsd.

Aug. 13, 1975	4.18	Aug. 5	3.68	Oct. 5	5.22
Sept. 9	3.57	Oct. 19	3.93	Nov. 7	5.13
Oct. 14	3.41	Nov. 15	3.97	Dec. 12	5.14
Nov. 3	3.57	Dec. 14	4.03	Mar. 21, 1978	5.38
Dec. 9	3.51	Jan. 18, 1977	4.17	Apr. 12	4.98
Jan. 14, 1976	3.73	Feb. 7	4.17	May 10	5.01
Feb. 12	3.63	Mar. 15	4.34	June 20	5.35
Mar. 15	3.67	Apr. 5	4.33	July 6	5.49
Apr. 13	2.65	May 10	4.37	Aug. 8	5.59
May 20	2.99	June 22	4.54	Sept. 11	6.04
June 22	3.21	July 11	4.72	Oct. 4	5.88
July 8	3.26	Aug. 4	5.19	Nov. 11	6.06
July 15	3.45	Sept. 22	5.21		

154-078-20CCC MP is top of 1¼-inch plastic pipe 1.00 ft above lsd.

May 24, 1978	1.75	June 20	1.98	Sept. 11	2.12
May 25	1.86	Aug. 8	2.10	Oct. 3	2.23

Depth to water, in feet below or (+) above land surface

154-078-24CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
May 20, 1976	68.03	Aug. 20	69.04	Oct. 5	70.40
June 22	68.47	Aug. 30	69.15	Nov. 7	70.23
June 22	68.43	Sept. 7	69.34	Dec. 12	70.22
June 24	68.45	Oct. 19	69.02	Jan. 17, 1978	70.26
July 8	68.53	Nov. 15	69.04	Feb. 21	70.35
July 15	68.82	Dec. 14	69.05	Mar. 21	70.40
July 22	68.80	Jan. 18, 1977	69.00	Apr. 12	70.34
Aug. 5	69.10	Feb. 7	69.06	May 10	70.30
Aug. 13	69.10	Mar. 15	69.24	June 20	70.87
Aug. 14	69.11	Apr. 5	69.20	July 6	71.16
Aug. 15	69.04	May 5	69.20	Aug. 9	71.71
Aug. 16	68.97	June 22	69.45	Sept. 11	72.06
Aug. 17	69.01	July 11	69.97	Oct. 4	71.49
Aug. 18	69.03	Aug. 4	70.89	Nov. 11	71.56
Aug. 19	69.02	Sept. 22	70.44		

154-078-25DAD MP is top of 1¼-inch steel pipe 1.38 ft above lsd.

Sept. 10, 1975	21.91	Aug. 5	21.92	Aug. 4	23.82
Oct. 14	21.80	Oct. 19	22.00	Sept. 22	23.60
Nov. 3	21.72	Nov. 15	22.03	Oct. 5	23.56
Dec. 9	21.66	Dec. 14	22.07	Nov. 7	23.49
Jan. 14, 1976	21.69	Jan. 18, 1977	22.14	Dec. 12	23.42
Feb. 12	21.67	Feb. 7	22.19	Jan. 17, 1978	23.62
Mar. 15	21.73	Mar. 15	22.26	Mar. 21	23.69
Apr. 13	20.92	Apr. 5	22.29	May 10	23.29
May 20	21.12	May 10	22.59	June 20	23.64
June 22	21.49	June 22	22.92		
July 8	21.62	July 11	23.32		

154-078-26BBB MP is top of 1¼-inch plastic pipe 2.10 ft above lsd.

Aug. 12, 1975	68.65	Aug. 14	68.11	June 22	68.67
Sept. 9	68.25	Aug. 15	68.16	July 11	68.79
Oct. 14	68.07	Aug. 16	68.10	Aug. 4	69.30
Nov. 3	68.09	Aug. 17	68.11	Sept. 22	69.59
Dec. 9	67.86	Aug. 18	68.15	Oct. 5	69.66
Jan. 14, 1976	68.04	Aug. 19	68.13	Nov. 7	69.38
Feb. 12	67.87	Aug. 20	68.11	Dec. 12	69.48
Mar. 15	67.97	Aug. 30	68.23	Feb. 21, 1978	69.56
Apr. 13	67.43	Sept. 7	68.55	Mar. 21	69.70
May 20	67.66	Sept. 9	68.46	Apr. 12	69.76
June 22	67.59	Oct. 19	68.10	May 10	69.39
June 23	67.54	Nov. 15	68.21	June 20	69.87
July 8	67.58	Dec. 14	68.31	July 6	69.94
July 15	67.97	Jan. 18, 1977	68.04	Aug. 9	70.30
July 15	67.95	Feb. 7	68.17	Sept. 11	70.63
July 22	67.83	Mar. 15	68.53	Oct. 4	70.64
Aug. 5	68.20	Apr. 5	68.44	Nov. 11	70.73
Aug. 13	68.19	May 10	68.40		

Depth to water, in feet below or (+) above land surface

154-078-27CBC MP is top of 1¼-inch plastic pipe 1.55 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 9, 1975	25.70	July 8	25.17	Mar. 15, 1977	26.76
Oct. 14	25.53	July 15	25.24	June 22	27.32
Nov. 3	25.57	Aug. 5	25.38	July 11	27.38
Dec. 9	25.51	Sept. 9	25.65	Aug. 4	27.53
Apr. 13, 1976	24.55	Oct. 19	25.91	Oct. 5	27.98
May 20	24.98	Nov. 15	26.10		
June 22	25.11	Dec. 14	26.28		

154-078-31BAA1 MP is top of 2-inch steel pipe 0.50 ft above lsd.

Oct. 28, 1976	40.82	July 11	41.85	Mar. 22	41.85
Nov. 15	42.60	Aug. 4	42.30	Apr. 13	41.88
Dec. 14	42.29	Sept. 22	42.34	May 10	41.78
Jan. 18, 1977	42.20	Oct. 5	42.28	June 20	41.61
Feb. 7	42.14	Nov. 7	42.10	July 6	42.00
Apr. 19	42.12	Dec. 12	41.95	Aug. 8	42.27
Apr. 28	42.10	Jan. 17, 1978	41.97	Sept. 11	42.24
June 22	42.00	Feb. 21	41.94	Oct. 3	42.28

154-078-31BAA2 MP is top of 2-inch steel pipe 2.50 ft above lsd.

Oct. 28, 1976	61.83	July 11	60.58	Mar. 22	62.55
Nov. 15	62.17	Aug. 4	62.66	Apr. 13	62.25
Dec. 14	62.17	Sept. 22	62.70	May 10	62.20
Jan. 18, 1977	62.26	Oct. 5	62.64	June 20	62.46
Feb. 7	62.35	Nov. 7	62.55	July 6	62.46
Apr. 19	62.30	Dec. 12	62.52	Aug. 8	62.57
Apr. 28	62.35	Jan. 17, 1978	62.62	Sept. 11	62.65
June 22	61.20	Feb. 21	62.67	Oct. 3	61.71

154-078-33CCC MP is top of 1¼-inch plastic pipe 1.90 ft above lsd.

Jan. 7, 1971	39.62	Nov. 8	39.04	Nov. 6	38.88
Feb. 8	39.73	Dec. 6	39.40	Dec. 2	39.33
Mar. 8	39.48	Mar. 10, 1973	38.78	June 18, 1975	38.88
May 13	39.19	Apr. 2	39.27	July 16	38.44
June 7	39.63	May 2	39.41	Aug. 13	38.90
July 16	39.40	May 30	39.17	Sept. 9	38.70
Aug. 2	39.54	June 27	39.21	Oct. 14	38.25
Sept. 13	39.06	Aug. 1	39.25	Nov. 3	38.34
Oct. 4	39.26	Aug. 29	39.94	Dec. 9	37.99
Nov. 3	39.33	Sept. 26	39.18	Jan. 14, 1976	38.29
Dec. 1	39.62	Oct. 31	37.76	Feb. 12	37.63
Jan. 3, 1972	39.61	Jan. 2, 1974	39.30	Mar. 15	38.02
Feb. 7	39.49	Jan. 30	38.72	Apr. 13	37.53
Mar. 7	39.35	Mar. 7	39.41	May 20	37.72
Apr. 6	38.82	Mar. 18	39.16	June 22	37.47
June 9	39.27	Apr. 29	39.32	July 8	37.21
July 11	39.04	June 18	38.79	Aug. 5	37.57
Aug. 7	38.98	Aug. 20	38.85	Oct. 10	37.32
Sept. 5	38.73	Sept. 9	38.99	Nov. 15	37.12
Oct. 2	39.16	Oct. 7	38.84	Dec. 14	37.07

Depth to water, in feet below or (+) above land surface

154-078-33CCC, Continued

Date	Water level	Date	Water level	Date	Water level
Jan. 18, 1977	37.34	Aug. 4	37.62	Mar. 21	36.81
Feb. 7	37.31	Sept. 22	37.74	Apr. 12	36.80
Mar. 15	37.43	Oct. 5	38.06	May 10	36.60
Apr. 5	37.48	Nov. 7	37.44	June 20	38.32
May 10	37.23	Dec. 12	37.43	July 6	38.19
June 22	37.50	Jan. 17, 1978	37.80	Sept. 11	37.97
July 11	37.24	Feb. 21	37.02	Oct. 3	38.23

154-078-34DDD MP is top of 1¼-inch plastic pipe 1.80 ft above lsd.

Aug. 12, 1975	20.52	July 22	20.37	Oct. 5	23.02
Sept. 9	20.79	Aug. 5	20.63	Nov. 7	23.03
Oct. 14	20.69	Oct. 19	21.66	Dec. 12	23.09
Nov. 3	20.61	Nov. 15	21.67	Jan. 17, 1978	23.20
Dec. 9	20.51	Dec. 14	21.70	Mar. 21	23.35
Jan. 14, 1976	20.50	Jan. 18, 1977	21.77	Apr. 12	22.73
Feb. 12	20.44	Feb. 7	21.82	May 10	22.55
Mar. 15	20.35	Mar. 15	21.82	June 20	22.78
Apr. 13	19.81	May 10	21.78	July 6	22.90
May 20	19.64	June 22	21.99	Aug. 9	23.22
June 22	19.98	July 11	22.03	Sept. 11	23.62
July 8	20.16	Aug. 4	22.43	Oct. 4	23.80
July 15	20.27	Sept. 22	23.00		

154-078-35AAA MP is top of 1¼-inch plastic pipe 2.30 ft above lsd.

Aug. 12, 1975	25.44	Aug. 5	25.24	Nov. 7	26.99
Sept. 10	25.30	Oct. 19	25.51	Dec. 12	27.01
Oct. 14	25.20	Nov. 15	25.60	Jan. 17, 1978	27.15
Nov. 3	25.18	Dec. 14	25.69	Feb. 21	27.23
Dec. 9	25.14	Jan. 18, 1977	25.83	Mar. 21	27.28
Jan. 14, 1976	25.24	Feb. 7	25.93	Apr. 12	26.93
Feb. 12	25.31	Mar. 15	26.08	May 10	27.16
Mar. 15	25.45	Apr. 5	26.19	June 20	27.22
Apr. 13	24.89	May 10	26.40	July 6	27.09
May 20	25.03	June 22	26.55	Aug. 9	26.95
June 22	25.06	July 11	26.69	Sept. 11	25.86
July 8	25.10	Aug. 4	26.71	Oct. 4	27.01
July 15	25.15	Sept. 22	26.90		
July 22	25.16	Oct. 5	26.95		

154-078-35BCC4 MP is top of 2-inch steel pipe 2.00 ft above lsd.

Sept. 9, 1975	3.80	July 11	9.87	Jan. 17, 1978	5.59
Oct. 19, 1976	5.23	July 20	4.84	Mar. 21	5.34
Nov. 15	4.71	July 26	11.98	Apr. 12	4.60
Dec. 14	4.53	Aug. 4	10.63	May 10	4.38
Jan. 18, 1977	4.45	Sept. 22	5.93	June 20	5.64
May 10	4.03	Oct. 5	5.62	Sept. 11	7.27
June 22	5.09	Dec. 12	5.51		

Depth to water, in feet below or (+) above land surface

154-078-36AAA MP is top of 3-inch steel pipe 0.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Sept. 10, 1975	18.34	July 8	18.07	May 10	19.20
Oct. 14	18.27	July 22	18.27	June 22	19.49
Nov. 3	18.22	Aug. 5	18.30	July 11	19.87
Dec. 9	18.77	Oct. 19	18.40	Aug. 4	20.40
Jan. 14, 1976	18.22	Nov. 15	18.46	Sept. 22	20.22
Feb. 12	18.24	Dec. 14	18.53	Oct. 5	20.17
Mar. 15	18.29	Jan. 18, 1977	18.64	Nov. 7	20.07
Apr. 13	17.55	Feb. 7	18.73	Dec. 12	20.07
May 20	17.70	Mar. 15	18.80	May 10, 1978	19.91
June 22	17.94	Apr. 5	18.86	June 20	19.20

154-079-14CCC1 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

May 26, 1978	51.31	July 6	51.44	Sept. 13	51.43
June 20	51.55	Aug. 8	51.50	Oct. 3	51.49

154-079-14CCC2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

June 20, 1978	50.80	Aug. 8	50.88	Oct. 3	50.74
July 6	50.70	Sept. 13	50.66		

154-079-16CCC MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Nov. 28, 1977	61.22	Apr. 13	61.41	Aug. 8	61.20
Dec. 12	60.99	Apr. 26	61.52	Sept. 13	61.16
Jan. 17, 1978	61.41	May 10	60.91	Oct. 3	61.27
Feb. 21	61.33	June 20	61.50		
Mar. 22	61.49	July 6	61.39		

154-079-24DDD MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Nov. 10, 1977	90.67	Mar. 22	90.78	July 6	90.62
Nov. 28	90.70	Apr. 13	90.40	Aug. 8	90.80
Dec. 12	90.68	Apr. 26	90.41	Sept. 11	90.77
Jan. 17, 1978	90.79	May 10	90.16	Oct. 3	90.85
Feb. 21	90.82	June 20	90.64		

154-079-29ABA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Nov. 28, 1977	72.59	May 10	71.94	Sept. 13	72.23
Dec. 12	72.26	June 20	72.45	Oct. 3	72.35
Apr. 13, 1978	72.46	Aug. 8	72.50		

Depth to water, in feet below or (+) above land surface

154-080-20BBB MP is top of 1¼-inch plastic pipe 3.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Jan. 7, 1971	68.43	Sept. 26	67.90	July 8	63.99
Mar. 8	68.50	Oct. 31	67.68	Aug. 10	64.39
May 13	67.85	Dec. 5	68.05	Sept. 12	65.20
June 7	67.92	Jan. 2, 1974	68.19	Oct. 19	66.54
Aug. 2	68.00	Feb. 6	68.01	Nov. 15	66.53
Sept. 13	67.80	Mar. 7	67.91	Dec. 14	66.56
Oct. 4	67.96	Apr. 29	66.87	Jan. 18, 1977	67.44
Nov. 3	67.99	June 18	65.28	Feb. 8	67.82
Dec. 1	68.20	Aug. 13	66.42	Mar. 15	68.30
Jan. 3, 1972	68.13	Sept. 16	66.80	Apr. 5	68.21
Feb. 10	67.99	Oct. 15	67.03	May 10	67.81
Mar. 7	67.93	Nov. 6	67.13	June 22	67.94
Apr. 6	67.29	Dec. 2	67.43	July 11	68.26
May 5	66.81	Mar. 18, 1975	67.72	Aug. 5	69.56
June 9	66.82	June 18	64.46	Sept. 22	70.99
July 11	66.71	July 17	64.51	Oct. 4	71.28
Aug. 7	67.08	Aug. 14	65.45	Nov. 10	71.76
Sept. 5	67.26	Aug. 19	65.61	Dec. 12	71.96
Oct. 2	67.37	Sept. 9	65.92	Jan. 17, 1978	72.73
Nov. 8	67.45	Oct. 15	65.96	Feb. 21	73.08
Dec. 6	67.70	Nov. 4	66.05	Mar. 22	73.48
Mar. 14, 1973	67.43	Dec. 9	65.95	Apr. 13	73.43
Apr. 2	67.67	Jan. 15, 1976	66.00	May 10	73.42
May 2	67.83	Feb. 12	66.01	June 20	74.18
May 30	67.79	Mar. 16	66.17	July 6	74.32
June 27	67.78	Apr. 15	64.67	Sept. 13	74.48
Aug. 1	68.05	May 20	62.78	Oct. 3	74.47
Aug. 29	67.82	June 22	63.78		

154-080-23CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Jan.	7, 1971	67.90	Aug.	29	66.79	July	8	63.05
Feb.	9	67.77	Sept.	28	66.91	Aug.	10	63.31
Mar.	8	67.84	Oct.	31	66.72	Sept.	12	63.78
May	13	67.39	Dec.	5	66.83	Oct.	19	64.81
June	7	67.42	Jan.	2, 1974	67.05	Nov.	15	64.89
Aug.	2	67.53	Jan.	30	66.81	Dec.	14	64.95
Sept.	13	67.10	Mar.	7	66.93	Jan.	18, 1977	65.55
Oct.	4	67.38	Mar.	18	66.91	Feb.	8	65.88
Nov.	3	67.37	Apr.	29	66.28	Mar.	15	66.31
Dec.	1	67.53	June	20	64.96	Apr.	5	66.38
Jan.	4, 1972	67.38	Aug.	13	65.56	May	10	66.16
Feb.	10	67.17	Sept.	10	65.67	June	22	66.30
Mar.	7	67.10	Oct.	15	66.03	July	11	66.40
Apr.	6	66.50	Nov.	7	66.10	Aug.	5	67.37
May	5	66.41	Dec.	2	66.36	Sept.	22	68.57
June	9	66.13	Mar.	12, 1975	66.53	Oct.	4	68.87
July	11	66.22	July	17	64.10	Nov.	10	69.31
Aug.	7	66.36	Aug.	14	64.65	Dec.	12	69.55
Sept.	5	66.49	Sept.	9	64.93	Jan.	17, 1978	70.24
Oct.	2	66.64	Oct.	15	64.90	Feb.	21	70.63
Nov.	8	66.64	Nov.	4	64.99	Mar.	22	71.01
Dec.	6	66.70	Dec.	9	64.84	Apr.	13	71.10
Mar.	14, 1973	66.58	Jan.	15, 1976	64.82	May	10	71.10
Apr.	4	66.87	Feb.	12	64.84	June	20	71.77
May	4	66.82	Mar.	16	65.04	July	6	71.90
May	30	66.89	Apr.	13	64.28	Aug.	1	72.48
June	27	66.89	May	20	62.61	Sept.	13	72.66
Aug.	8	66.70	June	25	62.83	Oct.	3	72.84

Depth to water, in feet below or (+) above land surface

154-080-24DAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 13, 1978	61.50	July 24	61.96	Sept. 13	62.49
July 14	61.97	Aug. 8	62.20	Oct. 3	62.69

155-075-15BBB MP is top of 2-inch steel pipe 0.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 2, 1976	11.39	June 21	12.35	Apr. 18	11.96
Nov. 15	11.46	July 13	12.29	May 11	11.90
Dec. 15	11.40	Aug. 4	12.45	June 21	12.23
Jan. 19, 1977	11.31	Sept. 22	12.60	July 7	12.29
Feb. 7	11.32	Oct. 4	12.42	Aug. 1	12.44
Mar. 16	11.40	Dec. 14	12.04	Sept. 12	12.60
Apr. 7	11.47	Feb. 22, 1978	11.95	Oct. 4	12.61
May 11	11.73	Mar. 22	11.95		

155-076-02CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
June 23, 1976	5.58	Mar. 16	6.30	Feb. 22	6.37
July 7	5.85	Apr. 7	6.30	Mar. 21	6.36
July 22	6.10	May 11	6.32	Apr. 13	6.35
Aug. 3	6.13	June 22	6.47	May 10	6.25
Aug. 5	6.17	July 11	6.32	June 20	6.49
Oct. 20	6.36	Aug. 4	6.56	July 6	6.48
Nov. 3	6.40	Sept. 22	6.70	Aug. 1	6.57
Dec. 14	6.29	Oct. 5	6.58	Sept. 11	7.81
Jan. 19, 1977	6.22	Dec. 12	6.39	Oct. 5	6.91
Feb. 7	6.26	Jan. 18, 1978	6.44		

155-076-10BBA2 MP is top of 1¼-inch plastic pipe 1.20 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 6, 1975	5.76	Oct. 20	7.30	Dec. 12	7.16
Sept. 10	5.60	Nov. 3	7.36	Jan. 18, 1978	7.32
Oct. 14	5.14	Dec. 14	7.45	Feb. 22	7.60
Nov. 4	5.23	Jan. 19, 1977	7.51	Mar. 21	7.55
Dec. 9	5.37	Feb. 7	7.53	Apr. 13	5.58
Jan. 14, 1976	5.60	Mar. 16	6.95	May 10	5.10
Feb. 12	5.63	Apr. 7	6.82	June 20	5.59
Mar. 15	5.58	May 11	6.68	July 6	5.78
Apr. 16	2.62	June 22	7.29	Aug. 1	6.41
May 20	3.42	July 11	6.97	Sept. 11	7.24
June 23	4.99	Aug. 4	7.18	Oct. 5	7.50
July 7	5.43	Sept. 22	7.77		
Aug. 3	6.22	Oct. 5	7.30		

Depth to water, in feet below or (+) above land surface

155-076-10CCC MP is top of 1¼-inch plastic pipe 1.90 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 7, 1975	5.59	Aug. 3	5.69	Sept. 22	7.71
Sept. 10	5.45	Oct. 20	6.82	Oct. 5	7.26
Oct. 14	4.91	Nov. 3	6.89	Dec. 12	7.37
Nov. 4	4.87	Dec. 14	7.04	Mar. 3, 1978	7.89
Dec. 9	5.05	Jan. 19, 1977	7.20	Apr. 13	6.52
Jan. 14, 1976	5.37	Feb. 7	7.29	May 10	6.11
Feb. 12	5.50	Mar. 16	7.05	June 20	6.44
Mar. 15	5.61	Apr. 7	6.96	July 6	6.74
Apr. 16	3.11	May 11	6.92	Aug. 3	7.14
May 20	3.32	June 22	7.46	Sept. 11	7.72
June 23	4.37	July 11	6.99	Oct. 5	7.89
July 7	4.82	Aug. 4	7.14		

155-076-21AAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Jan.	7, 1971	4.44	Sept.	5	3.89	May	20	0.85
Feb.	8	4.81	Oct.	1	4.00	June	23	1.79
Mar.	12	4.86	Nov.	5	4.19	July	7	2.14
May	18	2.82	Dec.	5	4.34	Aug.	3	2.80
June	4	3.12	Jan.	7, 1974	4.34	Oct.	20	3.72
July	16	3.65	Feb.	6	4.58	Nov.	3	3.80
Aug.	5	4.02	Mar.	4	4.64	Dec.	14	3.96
Sept.	13	3.62	Apr.	3	4.44	Jan.	19, 1977	4.20
Oct.	5	3.53	May	1	2.11	Feb.	7	4.37
Nov.	1	2.73	June	19	1.94	Mar.	16	3.90
Dec.	1	3.03	July	16	2.89	Apr.	7	3.82
Jan.	4, 1972	3.70	Aug.	5	3.45	May	11	3.54
Feb.	10	4.32	Sept.	9	3.86	June	22	4.10
Mar.	9	4.55	Sept.	30	4.02	July	11	3.49
Apr.	6	3.82	Oct.	29	4.12	Aug.	4	3.86
May	1	2.75	Dec.	4	4.60	Sept.	22	4.28
June	5	1.89	Mar.	6, 1975	4.67	Oct.	5	3.76
July	11	2.80	June	18	1.05	Dec.	12	3.98
Aug.	7	2.83	July	16	2.04	Jan.	18, 1978	4.40
Sept.	5	3.51	Aug.	7	2.86	Feb.	22	4.65
Oct.	2	3.30	Sept.	10	2.35	Mar.	21	4.80
Nov.	8	3.32	Oct.	14	1.82	Apr.	13	3.43
Dec.	6	3.66	Nov.	4	1.90	May	10	2.89
Mar.	5, 1973	4.07	Dec.	9	2.19	June	20	3.15
Apr.	2	3.49	Jan.	14, 1976	2.57	July	6	3.36
May	11	3.08	Feb.	12	2.76	Sept.	11	4.21
June	4	3.58	Mar.	15	2.78	Oct.	5	4.34
Aug.	13	3.88	Apr.	16	.39			

Depth to water, in feet below or (+) above land surface

155-076-28BBB MP is top of 1¼-inch plastic pipe 1.80 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Aug. 7, 1975	5.36	Oct. 20	6.48	Dec. 12	6.56
Sept. 10	5.00	Nov. 3	6.53	Jan. 18, 1978	6.83
Oct. 14	4.53	Dec. 14	6.68	Feb. 22	7.08
Nov. 4	4.55	Jan. 19, 1977	6.84	Mar. 21	7.19
Dec. 9	4.80	Feb. 7	6.92	Apr. 13	6.17
Jan. 14, 1976	5.07	Mar. 16	6.76	May 10	5.83
Feb. 12	5.14	Apr. 7	6.53	June 20	6.03
Mar. 15	5.29	May 11	6.48	July 6	6.15
Apr. 16	3.20	June 22	6.74	Aug. 1	6.37
May 20	3.90	July 11	6.40	Sept. 11	6.75
June 23	4.78	Aug. 4	6.50	Oct. 5	6.87
July 7	5.03	Sept. 22	6.81		
Aug. 3	5.70	Oct. 5	6.39		

155-077-17AAA MP is top of 1¼-inch plastic pipe 1.80 ft above lsd.

Jan. 7, 1971	12.50	Sept. 10	13.07	July 8	10.23
Feb. 8	12.65	Oct. 1	13.12	Aug. 3	10.71
Mar. 12	12.80	Nov. 5	13.02	Oct. 19	11.60
Apr. 15	11.76	Dec. 5	13.25	Nov. 16	11.77
May 13	11.64	Jan. 7, 1974	13.35	Dec. 15	11.97
July 16	12.00	Mar. 6	13.56	Jan. 19, 1977	12.18
Aug. 5	12.23	Apr. 3	13.44	Feb. 7	12.27
Sept. 13	12.40	May 2	12.27	Mar. 16	12.19
Oct. 5	12.50	June 19	11.35	Apr. 7	12.25
Nov. 1	12.34	July 19	11.79	May 11	12.19
Dec. 1	12.40	Aug. 5	11.99	June 21	12.45
Jan. 4, 1972	12.57	Sept. 9	12.19	July 12	12.67
Feb. 10	12.81	Sept. 30	12.34	Aug. 5	12.85
Mar. 9	12.90	Oct. 29	12.46	Sept. 22	13.12
Apr. 6	12.28	Dec. 4	12.75	Oct. 4	13.07
May 1	11.94	Mar. 6, 1975	13.01	Nov. 7	13.15
June 5	11.58	June 18	9.96	Dec. 13	13.28
July 11	11.87	July 16	10.52	Jan. 17, 1978	13.38
Aug. 7	11.90	Aug. 13	10.75	Feb. 21	13.51
Sept. 5	12.16	Sept. 10	10.64	Mar. 22	13.59
Oct. 2	12.23	Oct. 14	10.34	Apr. 12	12.96
Nov. 8	12.34	Nov. 4	10.39	May 11	12.78
Dec. 6	12.49	Dec. 9	10.49	June 20	12.84
Mar. 5, 1973	12.71	Jan. 14, 1976	10.69	July 6	12.94
Apr. 2	12.56	Feb. 12	10.82	Aug. 9	13.18
May 11	12.48	Mar. 15	10.92	Sept. 12	13.38
June 4	12.69	Apr. 16	9.55	Oct. 4	13.47
July 5	12.78	May 20	9.51		
Aug. 9	12.93	June 23	10.00		

155-077-26BAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Nov. 24, 1977	5.19	May 10	3.98	Sept. 12	5.40
Dec. 13	5.11	June 20	3.84	Oct. 4	5.74
Apr. 25, 1978	4.77	Aug. 9	4.68		

Depth to water, in feet below or (+) above land surface

155-077-27ABD MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 24, 1977.....	0.48	Dec. 13.....	0.20	Apr. 26, 1978.....	+1.80

155-078-16DDD MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Jan.	7, 1971.....	6.94	Sept.	10.....	6.73	Aug.	3.....	6.01
Feb.	8.....	7.13	Oct.	1.....	7.78	Oct.	19.....	6.92
Mar.	12.....	7.19	Dec.	5.....	7.90	Nov.	16.....	7.07
Apr.	15.....	5.91	Jan.	7, 1974.....	7.99	Dec.	15.....	7.23
May	13.....	5.75	Mar.	6.....	8.20	Jan.	19, 1977.....	7.41
July	16.....	6.27	Apr.	3.....	7.77	Feb.	7.....	7.50
Aug.	5.....	6.67	May	2.....	6.63	Mar.	16.....	7.47
Sept.	13.....	7.02	June	19.....	5.67	Apr.	7.....	7.49
Oct.	5.....	7.03	July	19.....	6.42	May	11.....	7.38
Nov.	1.....	6.79	Aug.	5.....	6.67	June	21.....	7.62
Dec.	1.....	6.85	Sept.	9.....	6.91	July	12.....	7.78
Jan.	4, 1972.....	7.13	Sept.	30.....	7.09	Aug.	5.....	7.94
Feb.	10.....	7.46	Oct.	29.....	7.20	Sept.	22.....	8.21
Apr.	6.....	6.98	Dec.	4.....	7.31	Oct.	4.....	8.16
May	1.....	6.35	Mar.	6, 1975.....	7.76	Nov.	7.....	8.23
June	5.....	6.13	June	18.....	4.44	Dec.	13.....	8.33
July	11.....	6.60	July	16.....	5.09	Jan.	17, 1978.....	8.42
Aug.	7.....	6.74	Aug.	13.....	5.58	Feb.	21.....	8.54
Sept.	5.....	7.10	Sept.	10.....	5.74	Mar.	22.....	8.52
Oct.	2.....	7.19	Oct.	14.....	5.47	Apr.	12.....	7.74
Nov.	8.....	7.27	Dec.	9.....	5.50	May	11.....	7.64
Dec.	6.....	7.43	Jan.	14, 1976.....	5.69	June	20.....	7.68
Mar.	5, 1973.....	7.73	Feb.	12.....	5.86	July	6.....	7.81
Apr.	2.....	7.59	Mar.	15.....	5.93	Aug.	8.....	7.95
May	11.....	7.43	Apr.	6.....	4.33	Sept.	12.....	8.37
June	4.....	7.10	May	20.....	4.38	Oct.	4.....	8.47
July	5.....	7.46	June	23.....	5.09			
Aug.	9.....	7.51	July	8.....	5.31			

155-080-15AAA MP is top of 2-inch steel pipe 3.00 ft above lsd.

Nov.	16, 1976.....	1.79	July	12.....	1.82	Apr.	20, 1978.....	1.59
Dec.	15.....	1.68	Aug.	5.....	1.90	July	13.....	1.67
Apr.	5, 1977.....	1.65	Oct.	4.....	1.78	Aug.	8.....	1.80
May	4.....	1.57	Nov.	7.....	1.65	Sept.	13.....	1.79
June	21.....	1.69	Dec.	13.....	1.60	Oct.	3.....	1.78

155-080-24AAA MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Aug.	8, 1978.....	12.60	Sept.	13.....	12.43			

Depth to water, in feet below or (+) above land surface

156-075-22CCC MP is top of 2-inch steel pipe 0.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 2, 1976	12.40	June 21	14.43	Apr. 18	14.12
Nov. 15	15.06	July 13	14.32	May 11	14.09
Dec. 15	14.57	Aug. 4	14.47	June 21	14.22
Jan. 19, 1977	14.40	Sept. 23	14.41	July 7	14.30
Feb. 7	14.38	Oct. 4	14.30	Aug. 2	14.45
Mar. 16	14.44	Dec. 14	14.15	Sept. 11	14.34
Apr. 7	14.45	Feb. 22, 1978	14.02	Oct. 4	14.36
May 11	14.40	Mar. 22	14.04		

156-076-08AAB MP is top of 1¼-inch plastic pipe 1.90 ft above lsd.

Jan. 6, 1971	4.04	Dec. 5	2.15	Oct. 20	3.98
Feb. 9	4.44	Feb. 6, 1974	3.19	Nov. 16	3.80
Mar. 12	4.32	Mar. 6	3.07	Dec. 15	4.02
May 19	3.24	Apr. 18	.63	Jan. 19, 1977	4.48
June 4	3.88	Sept. 5	3.71	Feb. 10	4.40
Aug. 5	4.48	Oct. 2	3.69	Mar. 15	3.38
Sept. 14	3.25	Oct. 31	3.11	Apr. 7	3.17
Oct. 5	2.32	Dec. 4	3.16	May 4	1.92
Nov. 1	1.64	Mar. 6, 1975	3.28	June 21	3.39
Dec. 1	2.10	July 17	3.39	July 12	2.28
Apr. 14, 1972	3.04	Aug. 6	3.87	Aug. 4	4.20
May 4	1.54	Aug. 19	3.86	Sept. 22	4.07
June 8	2.28	Aug. 26	3.96	Oct. 4	3.26
July 13	3.41	Sept. 10	3.25	Nov. 7	3.27
Aug. 8	3.28	Oct. 14	1.55	Dec. 13	3.76
Sept. 7	3.78	Nov. 4	1.93	Jan. 18, 1978	4.06
Oct. 4	3.34	Dec. 9	1.92	Mar. 23	3.87
Nov. 7	2.81	Jan. 14, 1976	2.17	Apr. 12	1.67
Dec. 6	3.60	Feb. 12	2.07	May 10	1.03
Apr. 9, 1973	3.05	Mar. 15	2.05	June 20	2.97
May 10	1.57	Apr. 16	.16	July 6	3.07
June 7	2.78	May 20	1.62	Aug. 1	4.50
Aug. 8	3.52	June 23	2.91	Sept. 12	4.63
Oct. 1	2.48	July 8	3.23	Oct. 4	4.55
Nov. 7	2.40	Aug. 3	4.22		

156-076-09ABC MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

May 1, 1978	5.20	July 6	7.45	Oct. 4	9.62
May 10	4.66	Aug. 2	8.86		
June 20	6.54	Sept. 12	9.31		

156-077-03DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Aug. 21, 1978	17.09	Sept. 12	17.23	Oct. 4	17.26

Depth to water, in feet below or (+) above land surface

156-077-08BBB MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
June 23, 1976	5.29	Apr. 7	6.66	Feb. 21	7.51
July 7	5.70	May 11	6.52	Mar. 22	7.63
Aug. 3	6.00	June 21	6.66	Apr. 12	6.94
Sept. 2	6.28	July 12	6.87	May 11	6.51
Oct. 19	6.53	Aug. 5	7.15	June 20	6.52
Nov. 16	6.55	Sept. 22	7.34	July 6	6.60
Dec. 15	6.66	Oct. 4	7.15	Aug. 2	6.96
Jan. 19, 1977	6.75	Nov. 7	7.06	Sept. 12	7.27
Feb. 10	6.85	Dec. 13	7.16	Oct. 4	7.33
Mar. 16	6.76	Jan. 17, 1978	7.30		

156-077-10BBB MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Aug. 2, 1978	5.90	Sept. 12	5.73	Oct. 4	5.73
Aug. 8	6.06				

156-077-13BBB2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

July 31, 1975	3.43	July 7	3.55	Sept. 22	8.02
Aug. 5	3.53	July 22	4.17	Oct. 4	7.86
Aug. 14	3.92	Aug. 3	4.58	Nov. 7	7.90
Aug. 19	4.03	Sept. 2	5.24	Dec. 13	8.03
Aug. 26	4.19	Oct. 20	5.95	Jan. 17, 1978	8.13
Sept. 10	4.24	Nov. 16	6.16	Feb. 21	8.30
Oct. 14	3.44	Dec. 15	6.35	Mar. 22	8.28
Nov. 4	3.46	Jan. 19, 1977	6.54	Apr. 12	4.80
Dec. 9	3.60	Feb. 10	6.66	May 11	4.62
Jan. 14, 1976	3.89	Mar. 16	5.31	June 20	4.98
Feb. 2	3.97	Apr. 7	5.46	July 6	5.38
Mar. 15	3.93	May 11	5.83	Aug. 2	6.17
Apr. 16	2.40	June 21	6.80	Sept. 12	7.35
May 20	2.03	July 12	6.76	Oct. 4	7.63
June 23	3.16	Aug. 5	7.42		

156-077-13CCB1 MP is top of 1¼-inch plastic pipe 1.70 ft above lsd.

July 31, 1975	2.94	July 7	4.11	Sept. 22	4.22
Aug. 6	3.31	July 22	4.10	Oct. 4	4.26
Aug. 14	4.16	Aug. 3	4.15	Nov. 7	3.97
Aug. 19	4.31	Sept. 3	4.02	Dec. 13	3.93
Aug. 26	4.47	Oct. 20	4.32	Jan. 17, 1978	3.98
Sept. 10	4.57	Nov. 16	4.19	Feb. 21	3.85
Oct. 14	4.42	Dec. 15	4.10	Mar. 22	3.87
Nov. 4	4.68	Jan. 19, 1977	4.10	Apr. 12	3.70
Dec. 9	4.38	Feb. 10	4.02	May 11	3.62
Jan. 14, 1976	4.37	Mar. 16	4.15	June 20	3.90
Feb. 12	3.98	Apr. 7	4.30	July 6	3.85
Mar. 15	4.08	May 11	4.02	Aug. 2	4.00
Apr. 6	3.75	June 21	4.17	Sept. 12	3.83
May 20	4.01	July 12	4.07	Oct. 5	4.12
June 23	3.91	Aug. 5	4.25		

Depth to water, in feet below or (+) above land surface

156-077-13CCB2 MP is top of 1¼-inch plastic pipe 1.80 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 31, 1975	3.31	July 7	3.82	Sept. 22	6.17
Aug. 6	3.66	July 22	4.38	Oct. 4	5.85
Aug. 14	5.01	Aug. 3	4.65	Nov. 7	5.68
Aug. 19	5.09	Sept. 3	5.13	Dec. 13	5.75
Aug. 26	5.25	Oct. 20	5.60	Jan. 17, 1978	5.97
Sept. 10	3.96	Nov. 16	5.64	Feb. 21	6.27
Oct. 14	3.13	Dec. 15	5.74	Mar. 22	6.23
Nov. 4	3.05	Jan. 19, 1977	5.89	Apr. 12	5.12
Dec. 9	3.15	Feb. 10	5.98	May 11	4.32
Jan. 14, 1976	3.50	Mar. 16	5.72	June 20	4.41
Feb. 12	3.52	Apr. 7	5.50	July 6	4.41
Mar. 15	3.56	May 11	5.12	Aug. 2	4.98
Apr. 6	.89	June 21	5.61	Sept. 12	5.76
May 20	1.96	July 12	5.53	Oct. 5	5.93
June 23	3.40	Aug. 5	5.87		

156-077-16DDD2 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
May 19, 1971	7.23	May 10	8.58	Aug. 26	7.12
Aug. 5	8.83	June 7	9.10	Sept. 10	7.15
Sept. 13	8.41	Aug. 8	9.62	Nov. 4	6.40
Oct. 5	8.62	Oct. 1	9.98	Apr. 16, 1976	4.52
Nov. 1	7.97	Nov. 7	9.90	July 7	6.26
Dec. 1	7.99	July 16, 1974	8.02	July 22	6.81
Jan. 4, 1972	8.21	Aug. 8	8.65	Aug. 3	7.17
May 4	6.95	Sept. 5	8.82	Sept. 2	7.72
June 9	7.06	Oct. 2	9.00	Oct. 19	8.05
July 13	7.98	Oct. 31	9.05	Nov. 16	8.16
Aug. 8	8.30	Dec. 4	9.18	May 11, 1977	8.66
Sept. 7	8.72	July 16, 1975	6.16	June 21	9.13
Oct. 4	8.87	Aug. 5	6.45	July 12	9.26
Nov. 7	8.89	Aug. 14	6.92	Aug. 2, 1978	9.62
Apr. 9, 1973	8.52	Aug. 19	6.97		

156-077-17AAA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
June 23, 1976	4.48	Mar. 16	6.59	Jan. 17, 1978	7.03
July 7	4.69	Apr. 7	6.32	Feb. 21	7.15
July 22	5.08	May 11	6.35	Mar. 22	7.22
Aug. 3	5.40	June 21	6.53	Apr. 12	6.35
Sept. 2	5.87	July 12	6.68	May 11	6.04
Oct. 19	6.27	Aug. 5	6.83	June 20	6.25
Nov. 16	6.38	Sept. 22	7.04	July 6	6.22
Dec. 15	6.47	Oct. 4	6.98	Sept. 12	6.75
Jan. 19, 1977	6.58	Nov. 7	6.89	Oct. 4	6.82
Feb. 10	6.66	Dec. 13	6.93		

Depth to water, in feet below or (+) above land surface

156-077-22CCC MP is top of 1¼-inch plastic pipe 1.90 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 30, 1975	4.12	July 7	3.50	Sept. 22	5.98
Aug. 4	3.97	July 22	3.76	Oct. 4	5.92
Aug. 14	4.13	Aug. 3	3.96	Nov. 7	5.93
Aug. 19	4.11	Sept. 2	4.38	Dec. 13	5.89
Aug. 26	4.16	Oct. 20	4.95	Jan. 17, 1978	5.92
Sept. 10	4.12	Nov. 16	5.08	Feb. 21	6.04
Oct. 14	3.83	Dec. 15	5.18	Mar. 22	6.16
Nov. 4	3.82	Jan. 19, 1977	5.25	Apr. 12	5.95
Dec. 9	3.62	Feb. 10	5.35	May 11	5.59
Jan. 14, 1976	3.65	Mar. 16	5.47	June 20	5.52
Feb. 12	3.73	Apr. 7	5.45	Aug. 2	5.69
Mar. 15	3.75	May 11	5.32	Sept. 12	5.96
Apr. 6	3.35	June 21	5.36	Oct. 5	6.16
May 20	2.87	July 12	5.47		
June 23	3.30	Aug. 5	5.73		

156-077-24CCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 31, 1975	4.88	July 7	5.31	Sept. 22	7.82
Aug. 5	5.14	July 22	5.93	Oct. 4	7.58
Aug. 14	5.59	Aug. 3	6.27	Nov. 7	7.43
Aug. 19	5.66	Sept. 2	6.82	Dec. 13	7.44
Aug. 26	5.86	Oct. 20	7.15	Jan. 17, 1978	7.62
Sept. 10	5.47	Nov. 16	7.20	Feb. 21	7.88
Oct. 14	4.70	Dec. 15	7.31	Mar. 22	7.89
Nov. 4	4.65	Jan. 19, 1977	7.45	Apr. 12	6.73
Dec. 9	4.75	Feb. 10	7.55	May 11	6.22
Jan. 14, 1976	5.07	Mar. 16	7.27	June 20	6.03
Feb. 12	5.16	Apr. 7	7.15	July 6	6.10
Mar. 15	5.19	May 11	7.15	Aug. 2	6.77
Apr. 16	2.75	June 21	7.51	Sept. 12	7.39
May 20	3.38	July 12	7.28	Oct. 5	7.49
June 23	4.92	Aug. 5	7.57		

156-077-24CDD MP is top of 1¼-inch plastic pipe 2.40 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 31, 1975	7.96	Apr. 16	4.56	Mar. 16	9.18
Aug. 5	7.83	May 20	5.09	Apr. 7	8.98
Aug. 14	7.68	June 23	6.48	May 11	8.80
Aug. 19	7.61	July 7	6.90	June 21	9.19
Aug. 26	7.59	July 22	7.53	July 12	9.04
Sept. 10	7.25	Aug. 3	7.88	Aug. 5	9.26
Oct. 14	6.60	Sept. 2	8.42	Sept. 22	9.60
Nov. 4	6.47	Oct. 20	9.06	Oct. 4	9.34
Dec. 9	6.56	Nov. 16	9.08	Apr. 12, 1978	8.60
Jan. 14, 1976	6.90	Dec. 15	9.17	May 11	7.93
Feb. 12	6.97	Jan. 19, 1977	9.30	June 20	7.60
Mar. 15	6.98	Feb. 10	9.41	Sept. 12	9.09

Depth to water, in feet below or (+) above land surface

156-077-27AAA MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 30, 1975	7.13	Feb. 12	7.16	Nov. 16	9.09
Aug. 4	6.75	Mar. 15	7.28	Dec. 15	9.20
Aug. 14	6.90	Apr. 6	3.54	Jan. 19, 1977	9.36
Aug. 19	6.70	May 20	5.31	Feb. 10	9.48
Aug. 26	6.93	June 23	6.58	Mar. 16	9.27
Sept. 10	6.71	July 7	6.93	Apr. 7	9.10
Oct. 14	5.62	July 22	7.40	May 11	8.74
Nov. 4	6.20	Aug. 3	7.73	June 21	8.89
Dec. 9	6.53	Sept. 2	8.35	July 12	9.24
Jan. 14, 1976	7.10	Oct. 19	9.00	Aug. 5	9.45

156-077-29BBC MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

July	30, 1975	5.75	July	7	6.22	Sept.	22	8.73
Aug.	4	5.42	July	22	6.64	Oct.	4	8.59
Aug.	14	5.47	Aug.	3	6.94	Nov.	7	8.48
Aug.	19	5.38	Sept.	2	7.45	Dec.	13	8.59
Aug.	26	6.54	Oct.	19	7.84	Jan.	17, 1978	8.73
Sept.	10	6.39	Nov.	16	7.92	Feb.	21	8.85
Oct.	14	5.78	Dec.	15	7.79	Mar.	22	8.84
Nov.	4	5.69	Jan.	19, 1977	8.12	Apr.	12	7.83
Dec.	9	5.79	Feb.	7	8.19	May	11	7.51
Jan.	14, 1976	5.95	Mar.	16	8.05	June	20	7.65
Feb.	12	6.17	Apr.	7	7.93	July	6	7.84
Mar.	15	6.21	May	11	7.89	Aug.	2	8.04
Apr.	16	3.97	June	21	8.10	Sept.	12	8.46
May	20	4.60	July	12	8.29	Oct.	5	8.56
June	23	5.85	Aug.	5	8.48			

156-078-33BBB MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

Aug.	2, 1978	4.00	Sept.	12	4.02	Oct.	5	4.15

156-079-10AAD MP is top of 4-inch pipe 2.70 ft above lsd.

Oct.	24, 1952	4.61	Nov.	27, 1962	4.42	July	16, 1975	0.82
Apr.	28, 1953	2.46	Apr.	25, 1963	4.76	Sept.	10	.77
Oct.	9	.49	Nov.	20	3.81	Oct.	14	1.92
Mar.	17, 1954	.99	May	7, 1964	3.90	Dec.	9	1.28
Sept.	29	.30	Oct.	7	3.28	Jan.	14, 1976	1.06
Apr.	15, 1955	.07	May	25, 1965	3.17	Feb.	12	.94
Oct.	25	1.34	Nov.	17	2.48	Apr.	16	+.74
May	24, 1956	1.76	May	5, 1966	2.54	July	8	.25
Sept.	20	2.11	Nov.	15	3.03	Oct.	19	.70
Apr.	30, 1957	3.07	Aug.	16, 1967	3.69	Nov.	16	.81
Sept.	15	4.84	Jan.	17, 1968	3.60	Dec.	15	.89
May	22, 1958	2.98	July	26	3.50	Mar.	16, 1977	1.10
Oct.	8	3.49	July	25, 1969	1.85	May	4	1.19
May	13, 1959	3.97	Dec.	17	2.37	June	21	1.22
Oct.	28	4.45	Dec	2, 1970	1.51	July	12	1.23
May	6, 1960	3.97	Dec.	1, 1971	1.36	Oct.	4	2.39
Oct.	5	3.43	Dec.	6, 1972	1.47	Dec.	13	1.59
May	4, 1961	3.80	Dec.	5, 1973	1.75	Apr.	20, 1978	1.79
Nov.	14	4.50	Dec.	3, 1974	2.09	May	11	1.77

Depth to water, in feet below or (+) above land surface

157-075-20BBB1 MP is top of 2-inch steel pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Dec. 14, 1976	47.76	July 12	47.42	May 10	47.14
Jan. 19, 1977	46.95	Sept. 22	47.48	June 21	47.40
Feb. 10	47.62	Oct. 4	47.49	July 6	47.30
Mar. 17	47.50	Dec. 13	47.25	Aug. 1	47.37
Apr. 7	47.13	Feb. 22, 1978	47.30	Sept. 12	47.19
May 3	47.22	Mar. 22	47.31	Oct. 4	47.30
June 22	47.60	Apr. 12	47.15		

157-075-20BBB2 MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Nov.	3, 1976	21.65	June	22	22.15	May	10	22.52
Nov.	15	21.73	July	12	22.57	June	21	22.50
Dec.	14	21.87	Sept.	22	22.69	July	6	22.48
Jan.	19, 1977	22.02	Oct.	4	22.75	Aug.	1	22.50
Feb.	10	21.84	Dec.	13	22.85	Sept.	12	22.27
Mar.	17	22.22	Feb.	22, 1978	22.92	Oct.	4	22.77
Apr.	7	22.29	Mar.	22	22.97			
May	3	22.38	Apr.	12	22.53			

157-075-31AAB1 MP is top of 1¼-inch plastic pipe 1.90 ft above lsd.

Nov.	1, 1966	52.85	Jan.	24, 1969	19.02	Aug.	5	18.42
Nov.	15	17.96	Feb.	19	19.02	Sept.	14	18.29
Nov.	23	19.55	Mar.	19	18.84	Oct.	5	18.28
Dec.	21	19.51	Apr.	30	18.72	Nov.	2	18.01
Jan.	19, 1967	19.47	May	27	18.64	Dec.	1	18.04
Feb.	15	19.40	June	24	18.78	Jan.	4, 1972	17.94
Feb.	28	19.40	July	25	18.70	Feb.	10	17.99
Mar.	12	19.42	Aug.	25	18.95	Mar.	9	17.90
Apr.	20	19.07	Sept.	17	19.19	Apr.	5	17.74
May	25	18.94	Oct.	15	19.08	May	4	17.65
June	6	19.01	Nov.	19	19.17	June	8	17.70
June	20	18.98	Dec.	16	18.97	July	13	17.91
July	20	19.22	Jan.	13, 1970	18.92	Aug.	8	18.02
Aug.	1	19.09	Feb.	11	18.85	Sept.	7	18.10
Aug.	15	19.45	Mar.	9	18.77	Oct.	5	18.19
Oct.	24	19.53	Apr.	9	18.69	Nov.	7	18.18
Nov.	21	19.60	May	13	18.07	Dec.	6	18.17
Dec.	20	19.50	June	9	18.22	Mar.	3, 1973	18.17
Jan.	17, 1968	19.38	July	7	18.41	Apr.	9	18.15
Feb.	12	19.44	Aug.	5	18.43	May	10	18.12
Mar.	27	19.26	Sept.	1	18.64	Aug.	8	18.37
Apr.	17	19.23	Sept.	28	18.61	Sept.	13	18.50
May	1	19.08	Nov.	2	18.62	Oct.	1	18.59
May	27	19.06	Dec.	2	18.55	Nov.	7	18.53
June	25	19.20	Jan.	6, 1971	18.51	Dec.	5	18.44
July	26	19.39	Feb.	9	18.42	Jan.	11, 1974	18.40
Aug.	26	19.18	Mar.	12	18.38	Feb.	6	18.37
Sept.	24	19.15	Apr.	16	18.14	Mar.	6	18.31
Oct.	24	19.26	May	12	18.05	Apr.	28	18.00
Nov.	20	19.15	June	3	18.11	June	19	17.81
Dec.	19	19.12	July	10	18.20	July	18	18.05

157-075-31AAB1, Continued

Date	Water level	Date	Water level	Date	Water level
Aug. 8, 1974	18.21	Mar. 15	19.17	June 22	19.77
Sept. 5	18.25	Apr. 16	19.14	July 12	19.66
Oct. 2	18.39	May 20	19.17	Aug. 4	19.79
Oct. 31	18.40	June 23	19.32	Sept. 22	19.82
Dec. 4	18.46	July 8	19.37	Oct. 4	19.71
Jan. 9, 1975	18.25	Aug. 5	19.53	Dec. 13	19.63
Mar. 6	18.21	Sept. 2	19.64	Mar. 22, 1978	19.57
June 3	17.57	Oct. 20	19.78	Apr. 12	19.50
Aug. 13	17.94	Nov. 3	19.81	May 2	19.55
Aug. 19	17.92	Nov. 15	19.82	May 10	19.47
Sept. 10	19.46	Dec. 14	19.80	June 21	19.62
Oct. 14	19.31	Jan. 19, 1977	19.82	July 6	19.55
Nov. 4	19.40	Feb. 10	19.83	Aug. 1	19.68
Dec. 9	19.35	Mar. 16	19.82	Sept. 12	19.69
Jan. 14, 1976	19.30	Apr. 7	19.83	Oct. 4	19.87
Feb. 12	19.21	May 11	19.78		

157-075-31AAB2 MP is top of 4-inch pipe 2.00 ft above lsd.

Nov.	15, 1966	16.95	Aug.	15	16.58	Jan.	5	16.89
Nov.	16	16.97	Aug.	20	16.64	Jan.	10	16.90
Nov.	23	17.87	Aug.	25	16.68	Jan.	15	16.90
Dec.	21	17.02	Aug.	31	16.71	Jan.	17	16.94
Jan.	5, 1967	17.02	Sept.	1	16.71	Jan.	20	16.91
Jan.	10	17.02	Sept.	5	16.72	Jan.	25	16.93
Jan.	15	17.02	Sept.	10	16.77	Jan.	31	16.93
Jan.	19	17.04	Sept.	15	16.77	Feb.	5	16.93
Feb.	15	17.12	Sept.	20	16.80	Feb.	10	16.93
Feb.	28	17.15	Sept.	25	16.82	Feb.	12	16.95
Mar.	12	17.14	Sept.	26	16.83	Feb.	15	16.93
Apr.	19	17.13	Sept.	28	16.82	Feb.	20	16.93
Apr.	20	16.71	Sept.	30	16.83	Feb.	25	16.93
Apr.	25	17.13	Oct.	5	16.85	Feb.	29	16.99
Apr.	30	17.13	Oct.	10	16.85	Mar.	1	16.99
May	5	17.15	Oct.	15	16.84	Mar.	5	16.99
May	10	17.16	Oct.	20	16.84	Mar.	10	16.98
May	15	16.89	Oct.	23	16.86	Mar.	15	16.98
May	20	16.81	Oct.	24	16.80	Mar.	20	16.85
May	25	16.34	Oct.	25	16.79	Mar.	25	16.85
June	6	16.29	Oct.	29	16.78	Mar.	27	16.80
June	20	16.26	Oct.	31	16.79	Mar.	31	16.79
June	25	16.27	Nov.	1	16.78	Apr.	1	16.79
June	30	16.27	Nov.	5	16.79	Apr.	5	16.78
July	1	16.27	Nov.	10	16.80	Apr.	10	16.78
July	4	16.32	Nov.	15	16.79	Apr.	15	16.76
July	5	16.31	Nov.	20	16.80	Apr.	17	16.77
July	10	16.34	Nov.	21	16.82	Apr.	20	16.77
July	15	16.38	Nov.	25	16.79	Apr.	25	16.74
July	19	16.41	Nov.	30	16.79	Apr.	28	16.73
July	20	16.42	Dec.	1	16.79	Apr.	30	16.73
July	25	16.43	Dec.	5	16.81	May	1	16.83
July	31	16.45	Dec.	10	16.81	May	5	16.71
Aug.	1	16.55	Dec.	15	16.82	May	10	16.69
Aug.	2	16.45	Dec.	20	16.85	May	15	16.66
Aug.	5	16.57	Dec.	25	16.86	May	20	16.65
Aug.	10	16.59	Dec.	31	16.88	May	25	16.65
Aug.	14	16.64	Jan.	1, 1968	16.87	May	27	16.64

157-075-31AAB2, Continued

Date	Water level	Date	Water level	Date	Water level
May 31, 1968	16.64	Jan. 10	16.64	Sept. 20	16.01
May 31	16.63	Jan. 15	16.64	Sept. 25	16.03
June 1	16.03	Jan. 20	16.65	Sept. 30	16.05
June 5	16.64	Jan. 24	16.70	Oct. 1	16.05
June 10	16.64	Jan. 25	16.68	Oct. 5	16.06
June 15	16.63	Jan. 31	16.68	Oct. 10	16.08
June 20	16.63	Feb. 1	16.68	Oct. 15	16.09
June 25	16.69	Feb. 5	16.71	Oct. 20	16.11
June 30	16.70	Feb. 10	16.69	Oct. 25	16.13
July 1	16.70	Feb. 15	16.69	Oct. 31	16.14
July 5	16.73	Feb. 19	16.72	Nov. 5	16.14
July 10	16.77	Feb. 20	16.69	Nov. 8	16.16
July 15	16.80	Feb. 25	16.69	Nov. 10	16.14
July 20	16.83	Feb. 28	16.69	Nov. 15	16.15
July 25	16.86	Mar. 1	16.69	Nov. 20	16.12
July 26	16.85	Mar. 5	16.69	Nov. 21	16.11
July 31	16.89	Mar. 10	16.70	Nov. 25	16.12
Aug. 5	16.92	Mar. 15	16.70	Nov. 30	16.12
Aug. 10	16.94	Mar. 19	16.75	Dec. 5	16.12
Aug. 15	16.96	Mar. 20	16.71	Dec. 10	16.13
Aug. 20	16.96	Mar. 25	16.71	Dec. 15	16.14
Aug. 25	16.94	Mar. 31	16.71	Dec. 20	16.16
Aug. 26	16.87	Apr. 1	16.75	Dec. 25	16.16
Aug. 31	16.76	Apr. 5	16.75	Dec. 31	16.16
Sept. 1	16.76	Apr. 10	16.26	Jan. 5, 1970	16.16
Sept. 5	16.73	Apr. 15	16.12	Jan. 10	16.16
Sept. 10	16.69	Apr. 20	15.98	Jan. 13	16.21
Sept. 15	16.64	Apr. 25	15.89	Jan. 15	16.21
Sept. 20	16.63	Apr. 30	15.82	Jan. 20	16.21
Sept. 24	16.59	Apr. 30	15.80	Jan. 25	16.24
Sept. 25	16.59	May 1	15.80	Jan. 31	16.26
Sept. 30	16.57	May 5	15.78	Feb. 1	16.26
Oct. 1	16.57	May 10	15.70	Feb. 5	16.29
Oct. 5	16.56	May 15	15.66	Feb. 10	16.29
Oct. 10	16.55	May 20	15.63	Feb. 11	16.31
Oct. 15	16.54	May 25	15.61	Feb. 15	16.31
Oct. 20	16.54	May 27	15.60	Feb. 20	16.31
Oct. 21	16.52	May 31	15.61	Feb. 25	16.31
Oct. 24	16.56	June 1	15.61	Feb. 28	16.31
Oct. 25	16.55	June 5	15.63	Mar. 5	16.31
Oct. 31	16.55	June 10	15.65	Mar. 9	16.40
Nov. 1	16.55	June 15	15.69	Mar. 10	16.36
Nov. 5	16.55	June 20	15.72	Mar. 15	16.36
Nov. 10	16.53	June 24	15.72	Mar. 20	16.36
Nov. 15	16.53	June 25	15.73	Mar. 25	16.36
Nov. 20	16.52	June 30	15.73	Mar. 31	16.36
Nov. 21	16.50	July 5	15.69	Apr. 5	16.36
Nov. 25	16.51	July 10	15.68	Apr. 9	16.09
Nov. 30	16.51	July 15	15.64	Apr. 10	16.08
Dec. 4	16.48	July 20	15.64	Apr. 15	16.03
Dec. 5	16.50	July 25	15.66	Apr. 20	15.99
Dec. 10	16.51	July 26	15.63	Apr. 25	15.96
Dec. 15	16.52	July 31	15.66	Apr. 30	15.85
Dec. 19	16.54	Aug. 5	15.69	May 1	15.83
Dec. 20	16.54	Aug. 10	15.73	May 5	15.73
Dec. 25	16.56	Aug. 15	15.78	May 10	15.60
Dec. 31	16.54	Aug. 20	15.82	May 12	15.53
Jan. 1, 1969	16.59	Aug. 25	15.84	May 15	15.51
Jan. 5	16.61	Sept. 17	15.98	May 20	15.41

Depth to water, in feet below or (+) above land surface

157-075-31AAB2, Continued

Date	Water level	Date	Water level	Date	Water level
May 25, 1970	15.34	Jan. 5	15.84	Sept. 5	15.71
May 31	15.27	Jan. 10	15.91	Sept. 10	15.57
June 1	15.26	Jan. 15	15.93	Sept. 13	15.51
June 5	15.21	Jan. 20	15.93	Sept. 14	15.53
June 9	15.17	Jan. 25	15.97	Sept. 15	15.52
June 10	15.16	Jan. 31	16.00	Sept. 20	15.53
June 15	15.13	Feb. 1	16.00	Sept. 25	15.54
June 20	15.12	Feb. 5	16.01	Sept. 30	15.55
June 25	15.11	Feb. 9	15.95	Oct. 5	15.57
June 28	15.09	Feb. 10	16.05	Oct. 6	15.58
June 30	15.13	Feb. 15	16.07	Oct. 10	15.55
July 1	15.13	Feb. 20	16.09	Oct. 15	15.56
July 5	15.16	Feb. 25	16.09	Oct. 20	15.53
July 7	15.19	Feb. 28	16.12	Oct. 25	15.41
July 10	15.20	Mar. 5	16.13	Oct. 31	15.30
July 15	15.22	Mar. 10	16.15	Nov. 1	15.30
July 20	15.25	Mar. 12	16.07	Nov. 2	15.29
July 25	15.26	Mar. 15	16.04	Nov. 5	15.25
July 31	15.25	Mar. 20	16.06	Nov. 10	15.23
Aug. 1	15.24	Mar. 25	16.08	Nov. 15	15.20
Aug. 5	15.30	Mar. 31	16.07	Nov. 20	15.17
Aug. 10	15.29	Mar. 31	16.02	Nov. 25	15.14
Aug. 15	15.32	Apr. 16	15.40	Nov. 30	15.14
Aug. 20	15.35	Apr. 20	15.39	Dec. 1	15.15
Aug. 25	15.38	Apr. 25	15.34	Dec. 5	15.12
Aug. 31	15.47	Apr. 30	15.29	Dec. 10	15.10
Sept. 1	15.44	May 1	15.29	Dec. 11	15.09
Sept. 5	15.49	May 5	15.25	Dec. 15	15.11
Sept. 10	15.54	May 10	15.22	Dec. 20	15.13
Sept. 15	15.56	May 12	15.17	Dec. 24	15.19
Sept. 20	15.56	May 14	15.18	Dec. 25	15.18
Sept. 25	15.59	May 15	15.19	Dec. 31	15.18
Sept. 28	15.55	May 20	15.19	Jan. 1, 1972	15.18
Sept. 31	15.56	May 25	15.19	Jan. 4	15.22
Oct. 1	15.55	May 31	15.21	Jan. 5	15.22
Oct. 5	15.56	June 1	15.21	Jan. 10	15.24
Oct. 10	15.60	June 3	15.23	Jan. 15	15.28
Oct. 15	15.62	June 5	15.23	Jan. 20	15.31
Oct. 20	15.62	June 10	15.23	Jan. 25	15.35
Oct. 25	15.64	June 15	15.25	Jan. 31	15.38
Oct. 31	15.66	June 20	15.28	Feb. 1	15.38
Nov. 2	15.67	June 25	15.29	Feb. 5	15.40
Nov. 5	15.68	June 30	15.33	Feb. 10	15.43
Nov. 6	15.65	July 1	15.33	Feb. 10	15.42
Nov. 10	15.67	July 5	15.34	Feb. 15	15.44
Nov. 15	15.68	July 10	15.38	Feb. 20	15.45
Nov. 20	15.69	July 10	15.39	Feb. 25	15.46
Nov. 23	15.71	July 15	15.39	Feb. 29	15.48
Nov. 25	15.67	July 20	15.43	Mar. 5	15.49
Nov. 30	15.70	July 25	15.46	Mar. 9	15.51
Dec. 1	15.69	July 31	15.49	Mar. 10	15.52
Dec. 2	15.78	Aug. 1	15.49	Mar. 15	15.52
Dec. 5	15.79	Aug. 5	15.55	Mar. 20	15.19
Dec. 10	15.80	Aug. 5	15.54	Mar. 21	15.13
Dec. 15	15.80	Aug. 10	15.57	Mar. 25	15.13
Dec. 20	15.83	Aug. 15	15.61	Mar. 31	15.13
Dec. 25	15.84	Aug. 20	15.63	Apr. 1	15.13
Dec. 31	15.86	Aug. 25	15.65	Apr. 5	15.10
Jan. 1, 1971	15.86	Aug. 31	15.69	Apr. 5	15.13

Depth to water, in feet below or (+) above land surface

157-075-31AAB2, Continued

Date	Water level	Date	Water level	Date	Water level
Apr. 10, 1972	15.12	Nov. 30	15.44	Jan. 20	16.17
Apr. 15	15.10	Dec. 1	15.44	Jan. 25	16.18
Apr. 20	15.10	Dec. 5	15.46	Jan. 31	16.21
Apr. 25	15.07	Dec. 6	15.45	Feb. 1	16.21
Apr. 30	15.03	Dec. 10	15.47	Feb. 5	16.22
May 1	15.03	Dec. 15	15.50	Feb. 6	16.20
May 4	14.98	Dec. 20	15.52	Feb. 10	16.24
May 5	14.99	Dec. 25	15.55	Feb. 15	16.25
May 10	14.96	Dec. 31	15.58	Feb. 20	16.27
May 15	14.90	Jan. 5, 1973	15.60	Feb. 24	16.29
May 20	14.87	Jan. 10	15.62	Feb. 25	16.29
May 25	14.84	Jan. 15	15.64	Feb. 28	16.29
May 31	14.81	Jan. 20	15.66	Mar. 1	16.27
May 31	14.82	Jan. 25	15.68	Mar. 5	16.29
June 5	14.80	Jan. 27	15.70	Mar. 6	16.30
June 8	14.80	Jan. 31	15.68	Mar. 9	16.32
June 10	14.83	Feb. 1	15.69	Mar. 10	16.32
June 15	14.86	Feb. 5	15.73	Mar. 15	16.30
June 20	14.88	Feb. 10	15.73	Mar. 20	16.30
June 25	14.89	Feb. 15	15.75	Mar. 25	16.30
June 30	14.91	Feb. 20	15.78	Mar. 31	16.30
July 1	14.91	Feb. 25	15.79	Apr. 2	16.29
July 5	14.95	Feb. 28	15.79	Apr. 5	16.27
July 10	14.97	Mar. 2	15.80	Apr. 10	16.00
July 13	14.97	Mar. 5	15.76	Apr. 15	15.78
July 15	15.00	Mar. 8	15.77	Apr. 20	15.64
July 20	15.04	Mar. 10	15.74	Apr. 25	15.51
July 25	15.06	Mar. 15	15.72	Apr. 28	15.44
July 31	15.08	Mar. 20	15.73	Apr. 30	15.37
Aug. 1	15.07	Mar. 25	15.72	May 1	15.37
Aug. 5	15.10	Mar. 26	15.70	May 5	15.32
Aug. 8	15.10	Mar. 31	15.70	May 10	15.25
Aug. 10	15.09	Apr. 1	15.70	May 15	15.19
Aug. 15	15.10	Apr. 5	15.68	May 20	15.14
Aug. 20	15.11	Apr. 9	15.68	May 25	15.05
Aug. 25	15.13	Apr. 10	15.68	May 31	14.89
Aug. 31	15.16	Apr. 15	15.64	May 31	14.91
Sept. 1	15.16	Apr. 19	15.60	June 1	14.89
Sept. 5	15.18	Apr. 20	15.61	June 5	14.80
Sept. 7	15.21	Apr. 25	15.61	June 10	14.72
Sept. 10	15.21	Apr. 30	15.60	June 15	14.64
Sept. 15	15.23	May 1	15.60	June 19	14.62
Sept. 20	15.26	May 5	15.57	June 20	14.61
Sept. 25	15.28	May 10	15.55	June 25	14.60
Sept. 30	15.29	May 10	15.54	June 26	14.59
Oct. 5	15.32	May 15	15.55	June 30	14.59
Oct. 7	15.28	May 17	15.52	July 1	14.59
Oct. 10	15.33	May 20	15.52	July 5	14.64
Oct. 15	15.35	May 25	15.52	July 10	14.68
Oct. 20	15.35	May 31	15.54	July 15	14.74
Oct. 25	15.37	June 5	15.58	July 18	14.78
Oct. 31	15.39	June 7	15.60	July 20	14.79
Nov. 1	15.39	June 10	15.63	July 25	14.83
Nov. 5	15.39	Aug. 8	15.82	July 31	14.88
Nov. 7	15.42	Sept. 13	15.96	Aug. 1	14.88
Nov. 10	15.42	Oct. 1	16.00	Aug. 5	14.92
Nov. 15	15.42	Nov. 7	16.07	Aug. 8	14.95
Nov. 20	15.43	Dec. 5	16.13	Aug. 10	14.96
Nov. 25	15.44	Jan. 11, 1974	16.14	Aug. 15	15.02
Nov. 29	15.45	Jan. 15	16.16	Aug. 20	15.04

Depth to water, in feet below or (+) above land surface

157-075-31AAB2, Continued

Date	Water level	Date	Water level	Date	Water level
Aug. 25, 1974	15.07	May 5	15.16	Feb. 29	15.25
Aug. 31	15.11	May 10	15.04	Mar. 5	15.26
Sept. 1	15.11	May 15	14.95	Mar. 10	15.26
Sept. 5	15.17	May 20	14.86	Mar. 15	15.26
Sept. 10	15.17	May 25	14.81	Mar. 20	15.16
Sept. 15	15.21	May 31	14.77	Mar. 25	14.95
Sept. 20	15.25	June 5	14.71	Mar. 31	14.84
Sept. 25	15.28	June 10	14.72	Apr. 5	14.70
Sept. 29	15.32	June 15	14.68	Apr. 10	14.55
Sept. 30	15.32	June 20	14.62	Apr. 15	14.40
Oct. 1	15.32	June 25	14.59	Apr. 20	14.37
Oct. 2	15.32	June 30	14.56	Apr. 25	14.32
Oct. 5	15.35	July 5	14.56	Apr. 30	14.25
Oct. 10	15.37	July 10	14.58	May 5	14.21
Oct. 15	15.41	July 15	14.58	May 10	14.23
Oct. 20	15.44	July 20	14.64	May 15	14.26
Oct. 25	15.46	July 25	14.67	May 20	14.30
Oct. 30	15.50	July 31	14.70	May 25	14.32
Oct. 31	15.50	Aug. 5	14.76	May 31	14.39
Nov. 1	15.50	Aug. 10	14.78	June 5	14.44
Nov. 5	15.50	Aug. 15	14.91	June 10	14.46
Nov. 10	15.52	Aug. 20	14.93	June 15	14.50
Nov. 15	15.54	Aug. 25	14.96	June 20	14.54
Nov. 20	15.56	Aug. 31	15.03	June 25	14.56
Nov. 25	15.58	Sept. 5	15.06	June 30	14.60
Nov. 30	15.61	Sept. 10	15.01	July 5	14.63
Dec. 1	15.61	Sept. 15	15.03	July 10	14.65
Dec. 4	15.67	Sept. 20	15.05	July 15	14.70
Dec. 5	15.63	Sept. 25	14.96	July 20	14.74
Dec. 10	15.63	Sept. 30	14.93	July 25	14.78
Dec. 15	15.66	Oct. 5	14.91	July 31	14.85
Dec. 20	15.67	Oct. 10	14.97	Aug. 5	14.89
Dec. 25	15.69	Oct. 15	14.98	Aug. 10	14.94
Dec. 31	15.72	Oct. 20	15.01	Aug. 15	14.99
Jan. 5, 1975	15.72	Oct. 25	14.98	Aug. 20	15.03
Jan. 9	15.77	Oct. 31	14.97	Aug. 25	15.08
Jan. 10	15.77	Nov. 5	15.03	Aug. 31	15.15
Jan. 15	15.77	Nov. 10	15.00	Sept. 5	15.19
Jan. 20	15.76	Nov. 15	14.99	Sept. 10	15.24
Jan. 25	15.78	Nov. 20	14.96	Sept. 15	15.29
Jan. 31	15.82	Nov. 25	14.99	Sept. 20	15.33
Feb. 5	15.83	Nov. 30	14.96	Sept. 25	15.38
Feb. 10	15.84	Dec. 5	14.94	Sept. 30	15.41
Feb. 15	15.86	Dec. 10	15.00	Oct. 5	15.45
Feb. 20	15.86	Dec. 15	15.05	Oct. 20	15.57
Feb. 25	15.90	Dec. 20	15.00	Oct. 25	15.60
Feb. 28	15.90	Dec. 25	15.07	Oct. 31	15.63
Mar. 5	15.91	Dec. 31	15.07	Nov. 5	15.64
Mar. 10	15.94	Jan. 5, 1976	15.09	Nov. 10	15.68
Mar. 15	15.95	Jan. 10	15.12	Nov. 15	15.70
Mar. 20	15.96	Jan. 15	15.19	Nov. 20	15.72
Mar. 25	15.97	Jan. 20	15.20	Nov. 25	15.74
Mar. 31	15.96	Jan. 25	15.21	Nov. 30	15.76
Apr. 5	15.97	Jan. 31	15.22	Dec. 5	15.79
Apr. 10	15.97	Feb. 5	15.23	Dec. 10	15.81
Apr. 15	15.82	Feb. 10	15.24	Dec. 15	15.76
Apr. 20	15.65	Feb. 15	15.24	Dec. 20	15.79
Apr. 25	15.52	Feb. 20	15.25	Dec. 25	15.80
Apr. 30	15.37	Feb. 25	15.25	Dec. 31	15.83

Depth to water, in feet below or (+) above land surface

157-075-31AAB2, Continued

Date	Water level	Date	Water level	Date	Water level
Jan. 5, 1977	15.85	July 5	16.20	Apr. 10	16.23
Jan. 10	15.88	July 10	16.22	Apr. 15	16.17
Jan. 19	15.95	July 15	16.23	Apr. 20	16.10
Jan. 20	15.96	July 20	16.22	Apr. 25	16.07
Jan. 25	15.98	July 25	16.24	Apr. 30	16.03
Jan. 31	16.01	July 31	16.25	May 2	16.05
Feb. 5	16.03	Aug. 5	16.27	May 5	16.03
Feb. 10	16.07	Aug. 10	16.29	May 10	15.98
Feb. 15	16.09	Aug. 15	16.31	May 15	15.97
Feb. 20	16.10	Aug. 20	16.33	May 20	15.96
Feb. 25	16.11	Aug. 25	16.35	May 25	15.95
Feb. 28	16.11	Aug. 31	16.39	May 31	15.94
Mar. 5	16.12	Sept. 5	16.39	June 5	15.93
Mar. 10	16.13	Sept. 10	16.40	June 10	15.92
Mar. 15	16.10	Sept. 15	16.41	June 21	15.97
Mar. 20	16.10	Sept. 20	16.42	June 25	15.98
Mar. 25	15.98	Sept. 25	16.43	June 30	16.01
Mar. 31	15.97	Sept. 30	16.40	July 6	16.00
Apr. 5	16.10	Oct. 5	16.37	July 10	15.96
Apr. 7	16.18	Oct. 10	16.33	July 15	15.95
Apr. 10	16.17	Oct. 15	16.31	July 20	16.00
Apr. 15	16.15	Oct. 20	16.34	July 25	16.02
Apr. 20	16.14	Oct. 25	16.29	July 31	16.07
Apr. 25	16.12	Oct. 31	16.29	Aug. 5	16.09
Apr. 30	16.10	Nov. 5	16.31	Aug. 10	16.13
May 5	16.08	Nov. 10	16.32	Aug. 15	16.16
May 10	16.05	Dec. 13	16.42	Aug. 20	16.20
May 15	15.97	Jan. 8, 1978	16.47	Aug. 25	16.22
May 20	15.98	Feb. 22	16.59	Aug. 31	16.25
May 25	15.99	Feb. 28	16.61	Sept. 12	16.30
May 31	16.03	Mar. 5	16.62	Sept. 15	16.31
June 5	16.06	Mar. 10	16.63	Sept. 20	16.32
June 10	16.12	Mar. 15	16.64	Sept. 25	16.34
June 15	16.14	Mar. 20	16.65	Sept. 30	16.35
June 22	16.14	Mar. 25	16.57	Oct. 4	16.38
June 25	16.16	Mar. 31	16.41		
June 30	16.18	Apr. 5	16.30		

157-076-14BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Dec. 13, 1977	6.35	June 20	6.34	Oct. 4	6.20
May 1, 1978	6.74	Aug. 1	6.25		
May 10	6.44	Sept. 12	6.16		

Depth to water, in feet below or (+) above land surface

157-076-34BAA MP is top of 1¼-inch plastic pipe 1.30 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 31, 1975	5.52	Aug. 3	9.02	Oct. 4	10.07
Aug. 6	6.29	Oct. 20	9.97	Dec. 13	10.57
Sept. 10	7.93	Nov. 16	10.03	Jan. 18, 1978	10.88
Oct. 14	7.07	Dec. 15	10.22	Feb. 22	11.15
Nov. 4	7.12	Jan. 19, 1977	10.50	Mar. 22	11.10
Dec. 9	7.67	Feb. 10	10.65	Apr. 12	8.95
Jan. 14, 1976	8.19	Mar. 15	10.23	May 11	8.32
Feb. 12	8.33	Apr. 7	9.84	June 21	9.00
Mar. 15	8.42	May 4	9.26	July 6	8.50
Apr. 16	3.40	June 21	10.06	Aug. 2	9.52
May 20	5.85	July 12	9.56	Sept. 12	10.04
June 23	7.31	Aug. 4	10.42	Oct. 4	10.18
July 8	7.67	Sept. 22	10.79		

157-076-34DDD MP is top of 1¼-inch plastic pipe 0.90 ft above lsd.

July	31, 1975	4.95	Aug.	3	5.49	Sept.	22	6.55
Aug.	6	5.11	Oct.	20	6.22	Oct.	4	6.38
Sept.	10	5.14	Nov.	16	6.43	May	10, 1978	5.65
Oct.	14	4.59	Dec.	15	6.34	June	20	5.68
Nov.	4	4.59	Mar.	15, 1977	6.39	July	6	5.81
Dec.	9	4.67	Apr.	7	6.24	Aug.	2	5.90
Apr.	16, 1976	2.74	May	4	6.08	Sept.	12	6.40
May	20	3.67	June	21	6.30	Oct.	3	6.53
June	23	4.74	July	12	6.24			
July	8	4.92	Aug.	4	6.26			

157-078-13CCC MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

July	31, 1978	27.37	Sept.	12	27.82	Oct.	3	27.97
Aug.	1	27.40						

157-078-23DDD MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

July	31, 1978	22.84	Sept.	12	22.17	Oct.	4	22.30
Aug.	1	22.80						

157-080-18DDD1 MP is top of 2-inch steel pipe 2.00 ft above lsd.

Dec.	15, 1976	36.62	Jan.	19, 1977	36.66	May	3	36.23

157-080-18DDD2 MP is top of 2-inch steel pipe 3.50 ft above lsd.

Nov.	16, 1976	29.01	Dec.	15	28.91	Jan.	19, 1977	28.88

Depth to water, in feet below or (+) above land surface

158-076-13BCB MP is top of 2-inch steel pipe 1.50 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Nov. 3, 1976	12.33	Sept. 22	12.64	Aug. 1	12.51
May 3, 1977	12.76	Oct. 4	12.65	Sept. 12	12.50
June 22	12.66	May 10, 1978	12.30	Oct. 4	12.55
July 12	12.53	June 21	12.52		

158-076-14CDC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Dec.	13, 1977	7.36	May	10	4.90	Sept.	12	7.58
Apr.	12, 1978	5.05	June	21	5.95	Oct.	4	7.45
May	1	5.23	Aug.	1	6.50			

158-078-13DDD1 MP is top of 2-inch steel pipe 2.00 ft above lsd.

Dec.	15, 1976	6.54	Sept.	22	6.46	June	21	6.29
Jan.	19, 1977	6.44	Oct.	4	6.35	July	6	6.16
Feb.	10	6.40	Dec.	13	6.23	Aug.	1	6.32
Apr.	7	6.76	Feb.	22, 1978	6.12	Sept.	21	6.34
May	3	6.61	Mar.	22	6.11	Oct.	3	6.32
June	22	6.42	Apr.	12	6.40			
July	12	6.46	May	11	6.15			

158-078-13DDD2 MP is top of 1¼-inch plastic pipe 2.50 ft above lsd.

Oct.	28, 1976	7.04	June	22	5.60	May	11	5.45
Nov.	16	6.72	July	12	5.90	June	21	5.29
Dec.	15	6.95	Sept.	22	7.10	July	6	4.97
Jan.	19, 1977	7.24	Oct.	4	6.80	Aug.	1	4.95
Feb.	10	7.55	Dec.	13	6.82	Sept.	21	5.98
Mar.	16	7.53	Feb.	22, 1978	7.58	Oct.	3	6.09
Apr.	7	7.44	Mar.	22	7.85			
May	3	7.03	Apr.	12	6.60			

158-079-13CCC MP is top of 2-inch steel pipe 2.00 ft above lsd.

Oct.	28, 1976	15.36	June	21	13.56	Aug.	1	13.80
Nov.	16	14.04	July	12	13.96	Sept.	21	14.11
Dec.	15	13.84	Oct.	4	14.05	Oct.	3	13.93
May	3, 1977	13.47	May	11, 1978	13.74			

158-079-22AAA3 MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

July	27, 1978	11.79	Sept.	21	11.71	Oct.	3	11.64
Aug.	1	11.15						

Depth to water, in feet below or (+) above land surface

158-079-23DCC MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
July 27, 1978	10.15	Sept. 21	10.31	Oct. 3	10.26
Aug. 1	10.19				

158-080-13DDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Oct.	28, 1976	17.29	Dec.	15	16.84	July	12	17.13
Nov.	16	17.63	June	21, 1977	17.02	Sept.	21, 1978	17.69

159-077-18CDD MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Dec.	13, 1977	4.30	Mar.	22, 1978	4.86

159-078-21ABA MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

June	23, 1976	19.25	Sept.	2	21.45	Aug.	31	35.50
July	8	19.33	Oct.	20	20.66	Sept.	6	36.63
July	28	19.99	Nov.	16	20.42	Oct.	4	34.47
July	28	20.14	Dec.	15	32.24	Nov.	2	39.46
July	29	23.43	Jan.	19, 1977	34.00	Dec.	13	37.73
July	29	25.80	Feb.	10	34.98	Apr.	12, 1978	39.80
July	30	28.50	Mar.	15	34.29	May	11	40.12
Aug.	2	27.88	Apr.	7	37.26	June	21	41.75
Aug.	3	25.77	May	4	40.00	July	6	41.52
Aug.	5	24.90	June	22	38.43	Aug.	1	42.30
Aug.	9	23.64	July	12	39.40	Sept.	21	43.29
Aug.	10	23.49	July	27	40.63	Oct.	3	42.65

159-078-21BAB1 MP is top of 1¼-inch plastic pipe 1.50 ft above lsd.

June	23, 1976	19.15	Aug.	13	23.00	Sept.	6	37.42
July	8	19.25	Aug.	20	22.07	Oct.	4	37.22
July	28	22.38	Sept.	2	21.26	Nov.	2	49.30
July	29	39.48	Oct.	20	20.58	Dec.	13	38.89
July	30	46.50	Nov.	16	20.37	Feb.	22, 1978	40.92
July	31	28.90	Dec.	15	38.12	Mar.	22	41.84
Aug.	2	27.50	Jan.	19, 1977	37.90	Apr.	12	40.45
Aug.	3	26.35	Feb.	10	35.93	May	11	40.58
Aug.	4	25.50	Mar.	15	34.20	June	21	42.64
Aug.	5	25.24	Apr.	7	38.57	July	6	42.17
Aug.	6	24.60	May	4	44.50	Aug.	1	49.12
Aug.	7	24.30	June	22	42.37	Sept.	21	44.48
Aug.	9	23.63	July	12	40.23	Oct.	3	43.52
Aug.	11	23.38	July	27	45.74			
Aug.	12	23.15	Aug.	31	35.40			

Depth to water, in feet below or (+) above land surface

159-078-21BBB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

Date	Water level	Date	Water level	Date	Water level
Oct. 4, 1977	17.57	Mar. 22	20.44	July 6	21.70
Nov. 2	18.23	Apr. 12	20.71	Aug. 1	21.60
Dec. 13	19.23	May 11	21.07	Sept. 21	22.61
Feb. 22, 1978	19.63	June 21	21.69	Oct. 3	22.23

159-078-22BCB MP is top of 1¼-inch plastic pipe 2.00 ft above lsd.

May	24, 1976	32.97	Dec.	15	39.15	July	12	39.19
June	23	37.00	Jan.	19, 1977	39.05	July	27	39.25
July	8	37.43	Feb.	10	38.99	Aug.	31	39.42
Aug.	3	38.23	Mar.	15	39.02	Oct.	4	39.37
Sept.	2	38.63	Apr.	7	39.11	Nov.	2	39.05
Oct.	20	39.17	May	3	38.68			
Nov.	16	39.12	June	22	39.00			

159-078-22DCB MP is top of 10-inch steel pipe 2.00 ft above lsd.

May	20, 1976	50.47	Jan.	19, 1977	49.93	Sept.	6	49.05
May	24	50.48	Feb.	10	49.61	Oct.	4	49.49
June	23	50.73	Mar.	15	49.93	Dec.	13	48.04
July	8	52.90	Apr.	7	49.49	Jan.	18, 1978	48.24
Aug.	3	53.29	May	4	48.47	Feb.	22	47.50
Sept.	2	51.14	June	22	49.27	Mar.	22	47.45
Oct.	20	52.58	July	12	48.85	Apr.	12	47.07
Nov.	16	52.56	July	27	49.05	June	21	47.00
Dec.	15	50.80	Aug.	31	48.83	July	6	46.94

TABLE 3.--Logs of wells and test holes

Depths are shown in feet below land surface.

Electric logs are uncalibrated.

Gamma-ray logs are uncalibrated.

Neutron logs are in API units.

Potential given in millivolts (mV).

Resistance given in ohms.

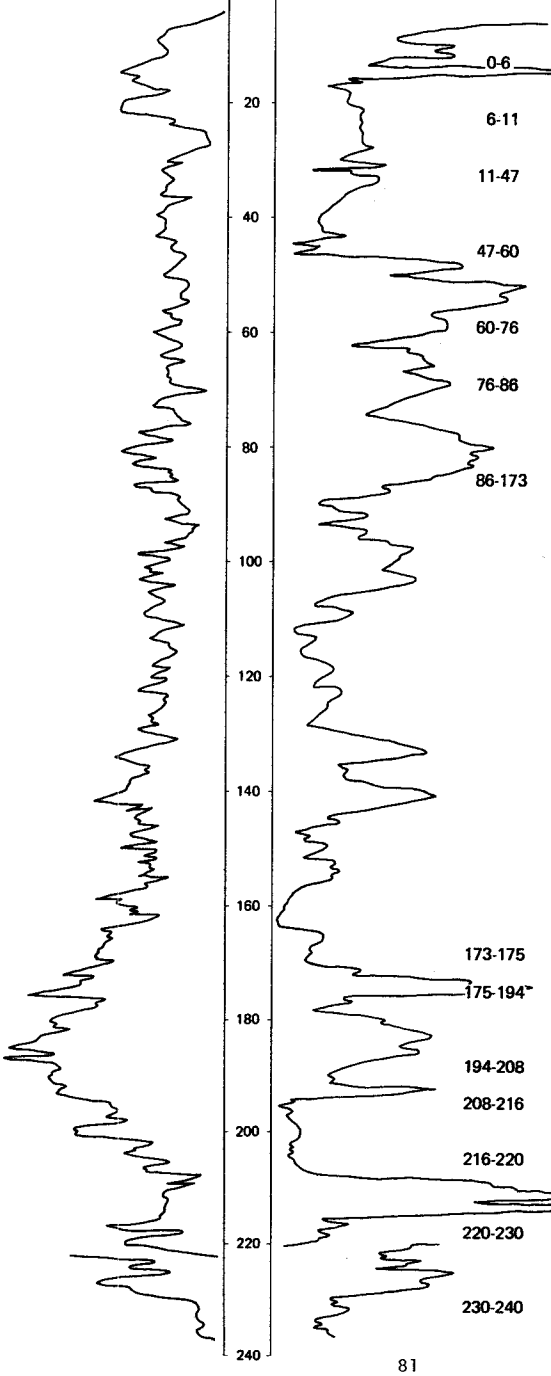
NDSWC 10182

LOCATION: 151-075-02DDD

DATE DRILLED: 8/09/78

ALTITUDE: 1605
(FT, NGVD)

DEPTH: 240
(FT)



	DESCRIPTION OF DEPOSITS
	GLACIAL DRIFT
0-6	Sand, very fine to very coarse, silty, gravelly, oxidized.
6-11	Till, yellowish-brown, sandy to gravelly, oxidized.
11-47	Till, dark-gray.
47-60	Sand, very fine to fine, subrounded.
60-76	Clay, dark-grayish-brown, very silty to sandy.
76-86	Sand, very fine to fine, subrounded.
86-173	Clay, dark-grayish-brown, silty to sandy.
173-175	Sand, fine to medium.
175-194	Till, dark-gray, sandy.
194-208	Till, dark-gray.
208-216	Gravel, very coarse; cobbles and boulders.
216-220	Till, dark-gray; boulders.
	HELL CREEK FORMATION
220-230	Sandstone, grayish-green, very fine to medium, clayey to silty, cemented.
230-240	Siltstone, dark-grayish-brown, clayey.

151-075-03BBB
Test hole 1088
(Log modified from Adolphson, 1961)

Altitude: 1611 feet — Date drilled: 10/24/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, sandy, yellow	3	3
	Till, yellow, and fine to medium gravel	13	16
	Till, gray, and fine to medium gravel	116	132
	Till, smooth, gray	10	142
	Till, sandy, gray	7	149
	Till, gray, and fine to medium gravel	104	253
	Gravel, cemented, clayey; very hard drilling	52	305
	Till, gray, and fine gravel	5	310
Fox Hills Sandstone:			
	Clay, smooth, silty, gray	5	315

151-075-04DDD
Test hole 1057
(Log modified from Adolphson, 1961)

Altitude. 1614 feet — Date drilled: 9/02/55

Glacial drift:			
	Till, yellow, and fine gravel	16	16
	Till, gray, and fine to medium gravel	186	202
	Sand, fine to medium, silty	10	212
	Till, gray, and fine to medium gravel	32	244
	Gravel, fine to medium	16	260
	Gravel, fine, and coarse sand	20	280
Fox Hills Sandstone:			
	Clay, smooth, sandy, gray	85	365
Pierre Shale:			
	Shale, gray	5	370

151-075-05DDD
Test hole 1058
(Log modified from Adolphson, 1961)

Altitude: 1616 feet — Date drilled: 9/06/55

Glacial drift:			
	Till, sandy, yellow	5	5
	Till, yellow, and fine gravel	13	18
	Till, gray, and fine gravel	3	21
	Sand, fine	10	31
	Till, gray, and fine gravel	4	35
	Sand, medium to coarse	21	56
	Till, gray, and fine to medium gravel	17	73
	Gravel, fine, sandy	17	90
	Till, gray, and fine to medium gravel	30	120
Hell Creek Formation:			
	Clay, sandy, silty, gray to brown	160	280

151-075-07AAA
Test hole 1059
(Log modified from Adolphson, 1961)

Altitude: 1597 feet — Date drilled: 9/09/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, yellow, coarse sand, and fine gravel	9	9
	Till, gray, and fine to medium gravel	24	33
	Till, sandy, gray	9	42
	Till, gray, and fine to medium gravel	60	102
	Sand, fine to medium, silty	8	110
	Till, sandy, green	17	127
	Till, gray, and fine to medium gravel	14	141
Hell Creek Formation:			
	Shale, lignitic	3	144
	Clay, smooth, brown	3	147
	Clay, sandy, silty, green	40	187
	Clay, lignitic, silty	25	212
Fox Hills Sandstone:			
	Clay, smooth, gray	8	220

151-075-07BBB
Test hole 1060
(Log modified from Adolphson, 1961)

Altitude: 1617 feet — Date drilled: 9/12/55

Glacial drift:			
	Till, sandy, yellow	11	11
	Till, gray, and fine to medium gravel	7	18
	Gravel, fine to medium	1	19
	Till, gray, and fine to medium gravel	13	32
	Sand, coarse, and fine gravel	3	35
	Gravel, fine to medium	4	39
	Till, gray, and fine to medium gravel; lost circulation from 70 to 83 feet	47	86
Hell Creek Formation:			
	Clay, sandy, gray	48	134
	Lignite	1	135
	Clay, smooth, brown	13	148
	Clay, smooth, gray	19	167
	Clay, smooth, brown	30	197
	Clay, sandy, silty, gray	13	210

151-075-15CBA
(Log modified from Mariner Drilling Service)

Date drilled: 12/12/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Yellow clay	37	38
	Blue sandy clay	87	125
	Mud and sand	3	128
	Blue clay and rocks	63	191
	Blue sand and mud	2	193
Hell Creek Formation:			
	Blue clay	23	216
	Sand and water	12	228

151-075-22C
(Log modified from Russell Drilling Co.)

Altitude: 1622 feet

Date drilled: 4/23/76

Glacial drift:			
	Till	125	125
	Gravel and sand	17	142
Hell Creek Formation:			
	Shale	3	145
	Bedrock sand	17	162

151-075-23DD
(Log modified from Russell Drilling Co.)

Altitude: 1620 feet

Date drilled: 5/20/74

Glacial drift:			
	Topsoil	1	1
	Yellow clay	19	20
	Blue clay	62	82
	Sand and gravel	4	86
	Blue clay	92	178
	Sand and gravel	12	190
Hell Creek Formation:			
	Bedrock shale	20	210
	Bedrock sand	20	230

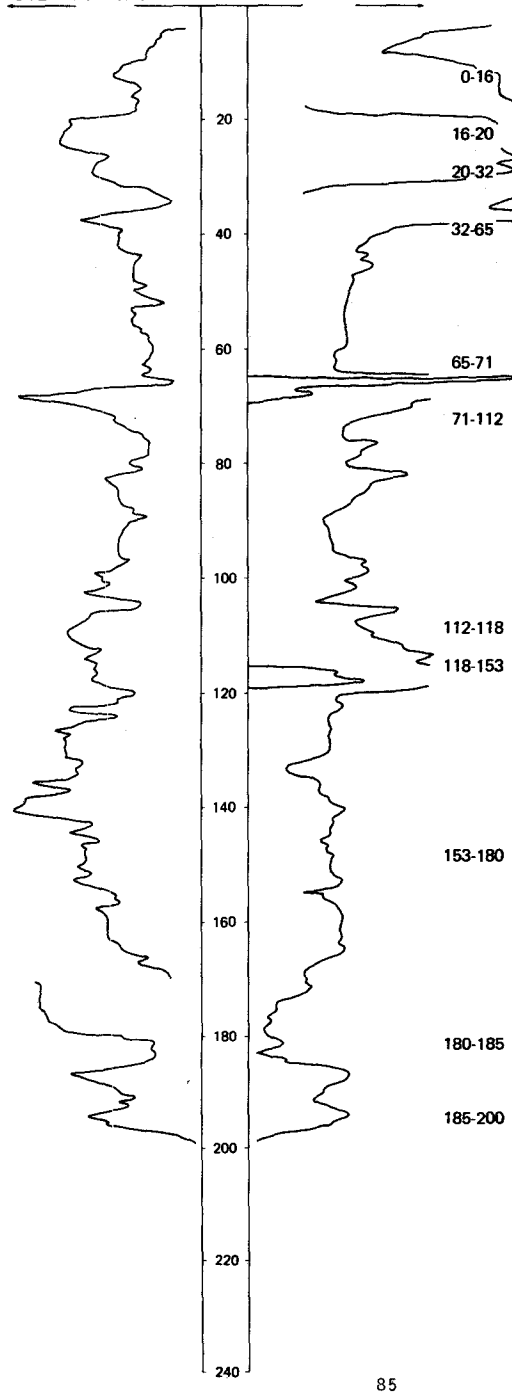
NDSWC 10184

LOCATION: 151-075-31CCC

DATE DRILLED: 8/09/78

ALTITUDE: 1610
(FT, NGVD)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-16	Till, light-olive to yellowish-brown, very silty, sandy, oxidized.
16-20	Till, dark-olive, silty to sandy.
20-32	Gravel, fine to coarse, and fine to very coarse sand; subangular.
32-65	Till, dark-gray.
65-71	Sand, very fine to coarse, gravelly; cobbles and boulders.
71-112	Till, dark-gray, gravelly; cobbles and boulders.
112-118	Gravel, fine to coarse, sandy.
118-153	Till, dark-gray; occasional thin lens of sand and gravel or boulder.
153-180	Till, dark-gray, very compact.

CANNONBALL MEMBER

180-185	Sandstone, gray, very fine, clayey; interbedded with dark-brownish-gray shale.
185-200	Sandstone, gray, fine to medium, clayey.

151-075-35AAA
NDSWC 10183

Altitude: 1630 feet — Date drilled: 8/09/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, yellowish-brown, very silty to sandy, oxidized	16	16
	Till, medium-dark-gray, very sandy, gravelly	24	40
	Gravel, fine to medium, sandy, angular to subrounded	4	44
	Till, dark-gray, very silty to sandy	4	48
	Sand, very fine to medium, silty	2	50
	Till, dark-gray, very sandy, gravelly	36	86
	Clay, dark-grayish-brown, very silty	48	134
	Gravel, fine to medium, sandy	2	136
	Till, dark-gray, very silty to sandy	22	158
	Clay, dark-grayish-brown, silty	13	171
	Sand, fine to medium, gravelly, silty	13	184
	Clay, brownish-gray, sandy	7	191
	Clay, grayish-brown to dark-gray, silty to sandy; cobbles and boulders from 211 to 213 feet	22	213
Fox Hills Sandstone:			
	Sandstone, greenish-gray, very fine, clayey; interbedded with grayish-brown clayey siltstone	27	240

151-076-01DC
(Log modified from Russell Drilling Co.)

Altitude: 1622 feet — Date drilled: 12/28/75

Glacial drift:			
	Brown clay	20	20
	Sand	3	23
	Rocky till	79	102
Hell Creek Formation:			
	Shale	33	135
	Sand	15	150
	White shaly sand	12	162
	Brown and black shale	43	205
	Sand	10	215
	Black shale	45	260
	Blue shale	20	280
Fox Hills Sandstone:			
	Sand	28	308
	Shale	7	315

151-076-02BCC
(Log modified from Russell Drilling Co.)

Date drilled: 10/27/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Gravelly till	20	20
	Bedrock; sandy shale	115	135
	Sticky sand	13	148
	Shale	22	170
	White sticky clay	37	207
	Silty shale	28	235
	Brown sticky sand	20	255
	Shale	55	310
	Loose sand	30	340
	Tight sand	20	360
	Shale	20	380

151-076-02CBC1
Test hole 1082
(Log modified from Adolphson, 1961)

Altitude: 1660 feet — Date drilled: 10/10/55

Glacial drift:			
	Till, sandy, yellow	3	3
	Till, yellow, and fine gravel	25	28
	Till, sandy, brown	26	54
	Till, sandy, gray-green	5	59
Cannonball Member:			
	Clay, silty, gray	11	70

151-076-02CCC
Test hole 1061
(Log modified from Adolphson, 1961)

Altitude: 1640 feet — Date drilled: 9/13/55

Glacial drift:			
	Sand, fine	5	5
	Till, yellow, and fine gravel	8	13
	Sand, medium to coarse, and fine gravel	6	19
	Till, gray, and fine to medium gravel	1	20
	Sand, medium to coarse, and fine gravel	14	34
	Till, gray, and fine to medium gravel	14	48
	Till, smooth, gray	3	51
	Till, gray, and fine to medium gravel	16	67
	Sand, medium to coarse, and fine gravel	10	77
	Till, gray, and fine to medium gravel; hard drilling from 98 to 100 feet	22	99
Cannonball Member:			
	Clay, smooth, dark-gray	21	120
	Clay, sandy, silty, gray	10	130

151-076-03AAA
Test hole 1063
(Log modified from Adolphson, 1961)

Altitude: 1647 feet — Date drilled: 9/15/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, yellow, and fine gravel	4	4
	Till, sandy, yellow	3	7
	Till, yellow, and fine to medium gravel	24	31
	Sand, fine to medium	13	44
	Till, gray, and fine to medium gravel	32	76
Cannonball Member:			
	Clay, smooth, dark-gray	24	100

151-076-04CCC
Test hole 1069
(Log modified from Adolphson, 1961)

Altitude: 1596 feet — Date drilled: 9/19/55

Glacial drift:			
	Till, sandy, yellow	19	19
	Sand, fine to medium	2	21
	Till, sandy, gray	12	33
	Till, gray, and fine to medium gravel	13	46
	Sand, medium to coarse, and fine gravel	3	49
	Till, sandy, gray	7	56
	Till, gray, and fine to medium gravel	15	71
Hell Creek Formation:			
	Clay, smooth, gray	17	88
	Clay, sandy, dark-gray	2	90

151-076-04DDD
Test hole 1068
(Log modified from Adolphson, 1961)

Altitude: 1604 feet — Date drilled: 9/19/55

Glacial drift:			
	Till, sandy, yellow	6	6
	Till, yellow, and fine to medium gravel	8	14
	Till, gray, and fine to medium gravel	10	24
	Sand, fine to medium	2	26
	Till, gray, and fine to medium gravel	14	40
Hell Creek Formation:			
	Clay, sandy, dark-gray	22	62
	Clay, smooth, light-gray	3	65
	Clay, smooth, dark-gray	5	70

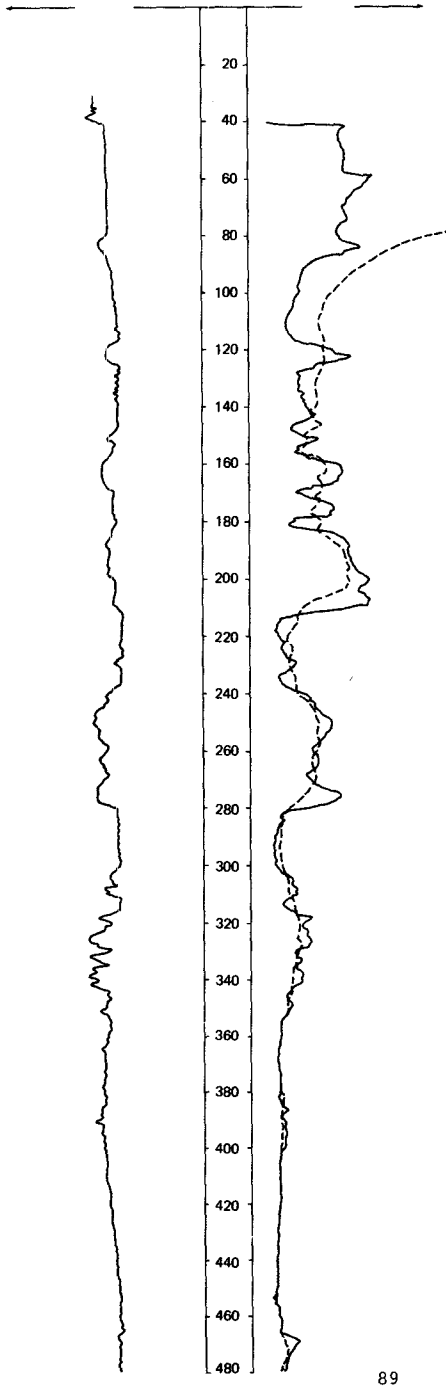
NDSWC 4972, 4972A, 4972B, 4972C

LOCATION: 151-076-07DDC1, 2, 3, 4

DATE DRILLED: 8/26/76

ALTITUDE: 1590 (FT, NGVD)

DEPTH: 550 (FT)



DESCRIPTION OF DEPOSITS

CANNONBALL MEMBER

0-22	Sandstone, yellowish-brown, fine, semiconsolidated, oxidized.

HELL CREEK FORMATION

22-82	Shale, medium-dark-gray; interbedded with brownish-gray siltstone; carbonaceous streaks.
82-88	Sandstone, medium-gray, very fine to fine, clayey.
88-118	Shale, medium-dark-gray, silty, micaceous.
118-125	Sandstone, medium-dark-gray, very fine, silty.
125-150	Shale, medium-dark-gray; interbedded with dark-gray slightly bentonitic siltstone; carbonaceous streaks.
150-152	Sandstone, medium-gray, very fine to fine, clayey.
152-158	Shale, medium-dark-gray, silty.
158-167	Sandstone, medium-dark-gray, very fine to fine.
167-172	Shale, dark-gray.
172-178	Sandstone, medium-gray, very fine, clayey.
178-183	Shale, dark-gray.
183-210	Sandstone, medium-bluish-gray, fine to medium.
210-237	Shale, medium-brownish-gray, silty, carbonaceous.

FOX HILLS SANDSTONE

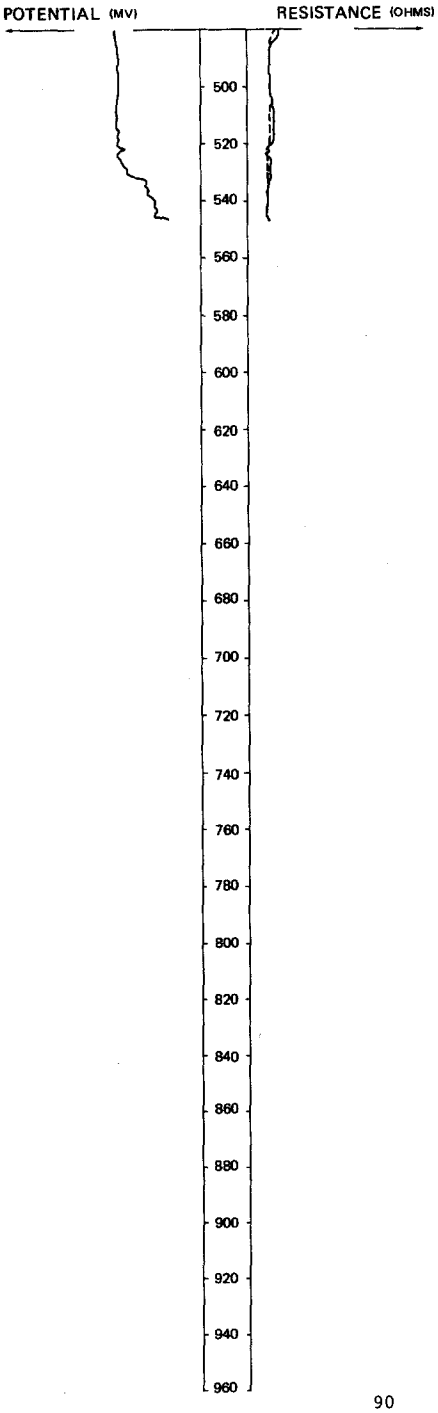
237-280	Sandstone, light-greenish-gray, fine to medium, rounded; some thin intermittent lenses of limestone.
280-284	Lignite, black, brittle.
284-303	Shale, medium-dark-gray, silty.
303-310	Sandstone, grayish-green, fine to medium, glauconitic.
310-316	Shale, brownish-gray, silty; carbonaceous streaks.
316-352	Sandstone, greenish-gray, fine to medium, glauconitic, semiconsolidated.
352-382	Shale, medium-dark-gray, silty.
382-402	Siltstone, greenish-gray; interbedded with thin lenses of fine sandstone.

LOCATION: 151-076-07DDC1, 2, 3, 4

DATE DRILLED: 8/26/76

ALTITUDE: 1590
(FT, NGVD)

DEPTH: 550
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

402-468	Shale, dark-gray.
468-485	Sandstone, dark-grayish-green, very fine.
485-522	Shale, medium-dark-gray, silty to sandy, bentonitic.

PIERRE SHALE

522-550	Shale, grayish-black, siliceous, brittle; slightly bentonitic in places.

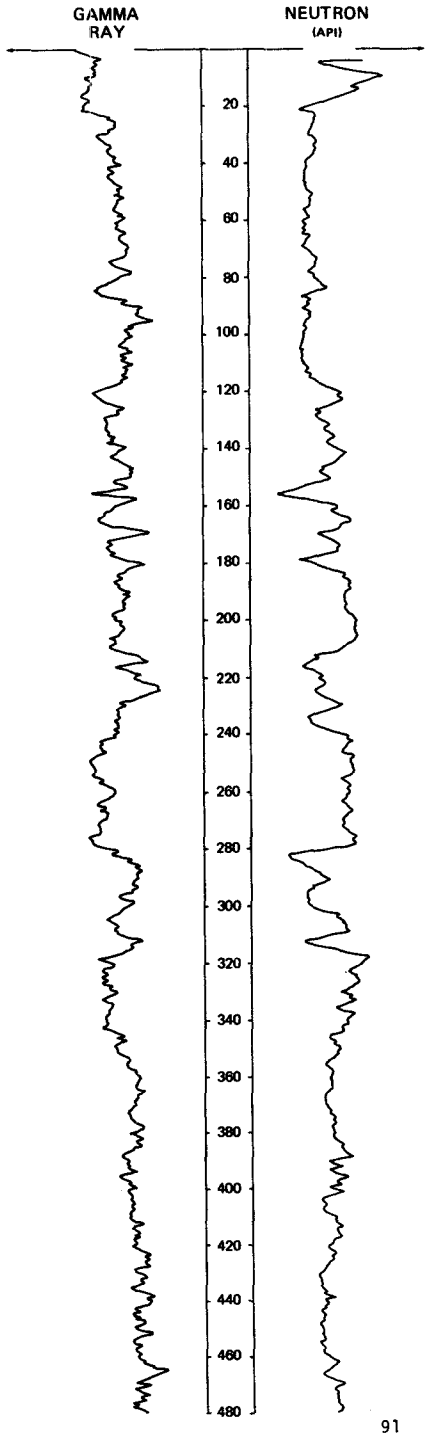
NDSWC 4972, 4972A, 4972B, 4972C, Continued

LOCATION: 151-076-07DDC1, 2, 3, 4

DATE DRILLED: 8/26/76

ALTITUDE: 1590
(FT, NGVD)

DEPTH: 550
(FT)



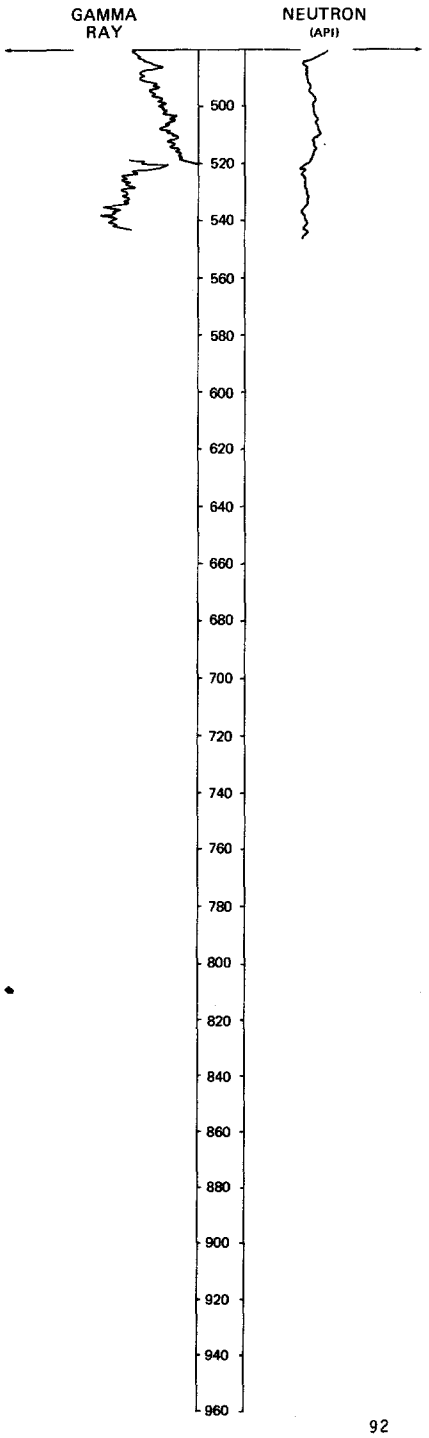
DESCRIPTION OF DEPOSITS

LOCATION: 151-076-07DDC1, 2, 3, 4

DATE DRILLED: 8/26/76

ALTITUDE: 1590
(FT, NGVD)

DEPTH: 550
(FT)



DESCRIPTION OF DEPOSITS

151-076-08ABB
Test hole 1081
(Log modified from Adolphson, 1961)

Altitude: 1585 feet — Date drilled: 10/08/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, sandy, dark-gray	4	4
	Till, sandy, yellow	10	14
	Sand, clayey, yellow	7	21
	Sand, fine to coarse	3	24
	Till, gray, and fine to medium gravel	29	53
Cannonball Member:			
	Clay, smooth, gray	17	70

151-076-08BBB
Test hole 1070
(Log modified from Adolphson, 1961)

Altitude: 1558 feet — Date drilled: 9/20/55

Glacial drift:			
	Sand, fine	3	3
	Sand, fine to medium	2	5
	Sand, medium to coarse, and fine gravel; large lignite fragments	17	22
	Sand, coarse, and fine gravel	18	40
	Till, gray, and fine to medium gravel	16	56
Cannonball Member:			
	Clay, smooth, gray	19	75
	Clay, smooth, light-brown	5	80

151-076-10AAA
(Log modified from Nick Erck Well Drilling)

Altitude: 1625 feet — Date drilled: 11/06/72

Black topsoil	2	2
Yellow clay	16	18
Fine sand	6	24
Gray clay	58	82
Bedrock shale	59	141

151-076-10AAD
(Log from Russell Drilling Co.)

Date drilled: 7/05/76

Sandy till	8	8
Gravel	3	11
Brown clay	5	16
Blue till	22	38
Shale	4	42
Bedrock sand	6	48
Shale	132	180
Sand	36	216
Blue shale	22	238
Shale	44	282

151-076-10DDD
Test hole 1074
(Log modified from Adolphson, 1961)

Altitude: 1620 feet — Date drilled: 9/28/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, silty, yellow, and coarse sand	22	22
	Till, yellow, and fine gravel	4	26
	Till, silty, gray, and fine gravel	9	35
	Till, sandy, gray	28	63
	Sand, fine to coarse, and fine gravel	11	74
	Sand, fine, silty, gray	16	90
	Till, gray, and fine gravel	10	100
	Till, sandy, gray	4	104
Cannonball Member:			
	Clay, sandy, light-gray	16	120

151-076-11BBB
Test hole 1062
(Log modified from Adolphson, 1961)

Altitude: 1640 feet — Date drilled: 9/15/55

Glacial drift:			
	Till, smooth, gray	3	3
	Till, yellow, and fine gravel	5	8
	Sand, medium to coarse	2	10
	Till, yellow, and fine gravel	3	13
	Till, gray, and fine to medium gravel	11	24
	Sand, medium to coarse, and fine gravel	6	30
	Till, gray, and fine to medium gravel	34	64
Cannonball Member:			
	Clay, smooth, gray	12	76
	Clay, sandy, silty, gray	9	85
	Clay, smooth, gray	25	110

151-076-14BCC
Test hole 1077
(Log modified from Adolphson, 1961)

Altitude: 1600 feet — Date drilled: 10/04/55

Glacial drift:			
	Clay, silty, gray-brown	5	5
	Clay, smooth, light-gray	2	7
	Clay, yellow, and fine gravel	3	10
	Clay, gray to yellow, fine gravel, and fine to coarse sand	3	13
	Sand, medium to coarse, and fine gravel	2	15
	Sand, fine to coarse, fairly clean	36	51
	Till, dark-gray, and fine gravel	14	65
Cannonball Member:			
	Clay, smooth, light-gray	5	70

151-076-14CCC
Test hole 1075
(Log modified from Adolphson, 1961)

Altitude:	1620 feet	Date drilled:	9/28/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, brown	6	6
	Sand, fine to coarse, brown to yellow, and fine gravel	9	15
	Sand, very fine to fine, gray, and lignite fragments	37	52
	Sand, fine to coarse	3	55
	Sand, fine to coarse, and fine gravel; shale pebbles	4	59
	Till, dark-gray, and fine gravel	16	75
Cannonball Member:			
	Clay, silty, light-gray	15	90

151-076-15ADC
NDSWC 8661

Altitude:	1600 feet	Date drilled:	8/25/66
Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, fine to medium, subangular to subrounded, oxidized	13	15
	Sand, medium, subrounded to subangular	20	35
	Sand, medium to coarse, subangular to subrounded	10	45
	Sand, very coarse to coarse, subrounded	10	55
	Sand, very fine to medium, silty, subangular	18	73
	Gravel, fine to medium, subangular to angular	5	78
Hell Creek Formation:			
	Siltstone, dark-greenish-gray, sandy, clayey, moderately indurated	27	105

151-076-15DAB
NDSWC 8662

Altitude:	1605 feet	Date drilled:	8/25/66
Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, fine to coarse, subangular to subrounded, oxidized	13	15
	Sand, fine to very fine, subrounded, oxidized	10	25
	Sand, fine to medium, subrounded; abundant detrital lignite	30	55
	Sand, medium to very coarse, predominantly medium, subrounded; silty to clayey from 65 to 75 feet	20	75
	Gravel, medium to coarse, sandy, silty, subangular to subrounded	10	85
Hell Creek Formation:			
	Siltstone, brown to greenish-gray, sandy, partially carbonaceous, moderately indurated	10	95

151-076-19ACC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1631 feet	Date drilled:	7/06/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Clay, black, organic, silty, sandy	4.4	5.4
	Till, brown, silty, sandy; becoming gray at 18.5 feet	15.6	21
	Sand, tan, fine and medium; trace of silt	1	22
	Till, gray; silty and sandy in zones; abundant fine and medium gravel	16	38
	Sand, gray, fine, silty	2	40

151-076-19CAB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1622 feet	Date drilled:	11/18/69
Glacial drift:			
	Topsoil, dark-brown	3	3
	Clay, gray	9	12
	Clay, gray, silty; some organic material and snail fossils	4	16
	Silt, gray to brown, organic; fossils throughout	12	28
	Clay, light-gray, silty	8	36
	Sand, gray, silty; estimate 60 percent predominantly fine sand and 40 percent nonplastic to slightly plastic fines	11	47
	Till, brown, silty	3	50

151-076-19CBC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1650 feet	Date drilled:	7/07/55
Glacial drift:			
	Topsoil	0.6	0.6
	Till, brown, silty to sandy	8.4	9
	Sand, tan to brown, fine	11	20
	Sand, brown, fine, silty; with trace of clay	15	35
	Sand, brown, fine; trace of silt	5	40
	Sand, brown; becoming gray at 41.3 feet; fairly well graded sand with approximately 5 to 10 percent fine gravel	3	43
	Till, gray, silty	7.8	50.8
	Sand, gray, fine, uniform, silty	4.2	55
	Sand, gray, fine to medium, silty; trace of clay; approximately 5 to 10 percent fine to medium gravel	15	70

151-076-19DAB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1637 feet — Date drilled: 11/18/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Till, brown, sandy, silty, oxidized	7	8
	Sand, yellowish-brown, silty	9.5	17.5
	Till, gray	15.5	33
	Sand, gray, clayey; estimate 60 percent predominantly fine sand and 40 percent moderately plastic fines	5	38
	Till, gray	22	60

151-076-20BDC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1613 feet — Date drilled: 11/17/69

Glacial drift:			
	Topsoil, black	1	1
	Till, yellowish-brown, sandy, silty, oxidized	8	9
	Sand, yellowish-brown, silty, gravelly; estimate 15 percent nonplastic fines	3.5	12.5
	Till, yellowish-brown, sandy, silty	2	14.5
	Till, gray, sandy, silty	5.5	20
	Till, bluish-gray, sandy, silty	3	23
	Till, gray to yellowish-brown	27	50

151-076-20DBD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1611 feet — Date drilled: 11/14/69

Glacial drift:			
	Topsoil, silty, sandy	1	1
	Till, yellowish-brown, sandy, silty	9	10
	Sand, gray to brown, silty	25	35
Cannonball Member:			
	Shale, black; alternating with fine sandy siltstone or sandstone	15	50

151-076-23CBB
Test hole 1078
(Log modified from Adolphson, 1961)

Altitude: 1600 feet — Date drilled: 10/04/55

Glacial drift:			
	Clay, sandy, dark-brown	3	3
	Clay, yellow, and fine gravel	11	14
	Clay, sandy, yellowish-brown	8	22
	Sand, fine, silty	7	29
	Clay, gray, and fine sand	3	32
	Sand, fine to coarse, and fine gravel	11	43
	Sand, coarse, and fine gravel	7	50
	Gravel, fine, and coarse sand	4	54
Cannonball Member:			
	Clay, sandy, silty, light-gray	16	70

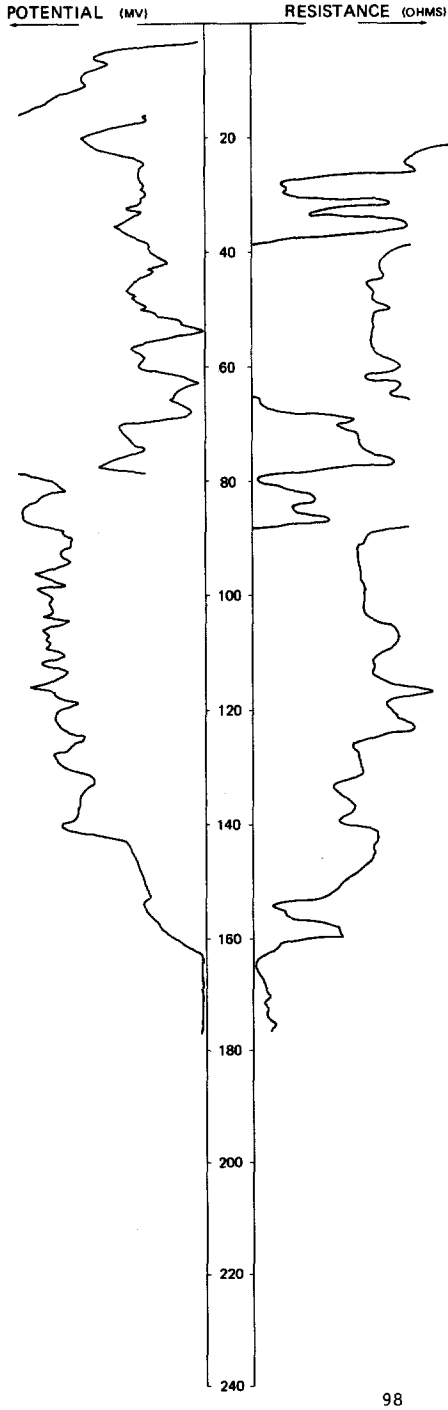
NDSWC 10185

LOCATION: 151-076-24DDD

DATE DRILLED: 8/09/78

ALTITUDE: 1620
(FT, NGVD)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-3	Sand, very fine to medium, oxidized.
3-12	Till, light-olive-brown, silty to sandy, oxidized.
12-22	Gravel, fine to medium; about 30 percent fine to very coarse sand; oxidized.
22-38	Till, medium-gray, silty; interbedded with sand lenses.
38-69	Till, medium-dark-gray, silty.
69-78	Gravel, fine to medium; about 40 percent very coarse sand.
78-88	Till, dark-gray, sandy to gravelly.
88-130	Till, dark-gray, silty to sandy.
130-163	Till, dark-gray, tight.

CANNONBALL MEMBER

163-180	Sandstone, medium-gray, medium, moderately indurated; interbedded with grayish-brown carbonaceous shale.

151-076-26BBB
Test hole 1076
(Log modified from Adolphson, 1961)

Altitude:	1623 feet	Date drilled:	9/30/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine, clayey, brown and yellow	4	4
	Clay, smooth, yellow	2	6
	Gravel, fine, clayey, yellow	15	21
	Clay, yellow, and fine gravel	4	25
	Hard rock; difficult drilling	2	27
	Clay, yellow to brown, and fine to medium sand	4	31
	Hard rock; difficult drilling	2	33
	Clay, silty, yellow to brown, and fine to coarse sand	3	36
	Sand, fine to medium, gray	14	50
	Till, smooth, dark-gray	10	60
Cannonball Member:			
	Clay, sandy, gray	10	70

151-076-28BBB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1614 feet	Date drilled:	7/05/55
Glacial drift:			
	Topsoil	1	1
	Till, buff, silty, sandy, oxidized	15.4	16.4
	Rock zone	2.6	19
	Sand, gray, silty; fine micaceous sand with clayey lenses from 25 to 29 feet	10	29
	Sand, dark-gray to black, silty, clayey; very fine micaceous sand	11	40

151-076-28BDB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1612 feet	Date drilled:	11/13/69
Glacial drift:			
	Topsoil, brown, dry, silty	1	1
	Till, yellowish-brown, sandy, silty	6	7
	Sand, yellowish-brown, silty	8	15
Cannonball Member:			
	Sandstone, gray, unconsolidated	27	42
	Shale, black; alternating with uncemented sandstone from 42 to 46 feet; thin unconsolidated sandstone layers from 46 to 50 feet	8	50

151-076-28DBC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1613 feet	Date drilled:	11/12/69
Glacial drift:			
	Topsoil, dark-brown, clayey; silty sand	1	1
	Till, brown, sandy, silty, oxidized	9	10
	Sand, gray, silty; estimate 80 percent fine sand and 20 percent nonplastic fines	15	25
Cannonball Member:			
	Sandstone, gray, silty, uncemented; some thin clay shale interbeds	25	50

151-076-29BBB
Missile Site A-5
(Log modified from J. N. Pitcher Drilling Co.)

Altitude: 1641 feet — Date drilled: 7/05/61

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, yellowish-brown, silty, oxidized	13	13
	Till, gray, silty	11	24
	Till, gray, sandy	3	27
	Sand, fine, gravelly; cobbles	9	36
	Silt, dark-gray, clayey	6	42
	Sand, fine to coarse, gravelly	5	47
	Till, dark-gray, silty to sandy	32	79
Cannonball Member:			
	Siltstone, medium-dark-gray, clayey	11	90
	Shale, grayish-black, silty	10	100

151-076-30BBC
NDSWC 10186

Altitude: 1631 feet — Date drilled: 8/10/78

Glacial drift:			
	Till, yellowish-brown, very silty to sandy, oxidized	20	20
	Till, medium-gray, silty to sandy	6	26
	Sand, fine to very coarse; about 10 percent gravel; subrounded	4	30
	Till, dark-gray, silty to very sandy; cobbles and boulders at 51 and 60 feet	30	60
	Clay, dark-grayish-brown, very silty to sandy	6	66
Cannonball Member:			
	Shale, dark-grayish-brown, silty, very compact	10	76
	Sandstone, medium-gray, very fine to medium, moderately indurated	24	100

151-076-33AAA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1617 feet — Date drilled: 9/07/69

Glacial drift:			
	Topsoil, dark-brown	1	1
	Till, light-brown to dark-brown, sandy to silty	5.5	6.5
	Sand, brown; estimate 85 to 90 percent coarse to predominantly fine sand and 10 to 15 percent fines	3.5	10
	Sand, gray, silty; estimate 80 percent fine sand and 20 percent nonplastic fines; little coarse sand and fine gravel with some clay from 18 to 20 feet	18.5	28.5
	Sand, silty; brown to 31 feet; gray below; estimate 75 percent fine sand and 25 percent nonplastic to slightly plastic fines	6.5	35
Cannonball Member:			
	Sandstone, gray, uncemented; high silt content	15	50

151-076-33AAB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1618 feet	Date drilled:	7/05/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	0.7	0.7
	Till, brown and buff, silty, sandy	2.3	3
	Sand, light-brown, fine, silty; grading to coarse at 9 feet	7	10
	Sand, brown; becoming gray at 13.2 feet; approximately 10 percent fine gravel; trace of clay; silty from 10 to 11 feet; lens of medium uniform gray sand from 14.7 to 15 feet; oxidized to 13.2 feet	9	19
	Till, gray, silty, sandy	2	21
	Sand, gray, fine; with some fine to coarse gravel from 26 to 30 feet	9	30
Cannonball Member:			
	Sand, greenish-gray, fine; with clayey streaks throughout	10	40

151-076-34ADD
Test hole 1079
(Log modified from Adolphson, 1961)

Altitude:	1610 feet	Date drilled:	10/06/55
Glacial drift:			
	Sand, clayey, dark-gray	3	3
	Sand, medium to coarse	9	12
	Gravel, fine to medium	16	28
Cannonball Member:			
	Clay, smooth, light-gray	3	31
	Clay, sandy, silty, light-gray	4	35
	Clay, sandy, silty, dark-gray	15	50

151-076-34BCD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1614 feet	Date drilled:	11/06/69
Glacial drift:			
	Topsoil, dark-brown	1	1
	Till, brown, sandy, silty	6	7
	Sand, brown; estimate 90 to 95 percent fine to medium sand and 5 to 10 percent nonplastic fines; becomes siltier near bottom	2.5	9.5
	Till, gray, sandy, silty	20.8	30.3
Cannonball Member:			
	Shale, gray; very silty in zones	19.7	50

151-076-34DCB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1622 feet	Date drilled:	11/05/69
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, silty	1	1
	Silt, tan	3	4
	Till, yellowish-brown, sandy, oxidized	6	10
	Sand, silty, gravelly; brown at top to gray at bottom; oxidized at top	9	19
	Till, bluish-gray	19	38
	Sand, gray, silty, clayey	1	39
Cannonball Member:			
	Shale, dark-brown, silty	11	50

151-076-34DDC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1629 feet	Date drilled:	7/01/55
Glacial drift:			
	Topsoil	0.6	0.6
	Till, brown, silty, sandy	12.4	13
	Sand, brown, fairly well graded; with approximately 5 to 10 percent fine gravel; trace of clay	2	15
	Till, brown, silty, sandy; becoming gray at 16 feet; oxidized to 16 feet	10	25
Cannonball Member:			
	Shale, gray, silty, sandy	15	40

151-077-01BCC
(Log modified from Russell Drilling Co.)

		Date drilled:	3/31/65
	Silty sand and gravel	18	18
	Blue clay	60	78
Cannonball Member:			
	Rocks	8	86
Hell Creek Formation:			
	Blue clay	93	179
	Brown oily shale	16	195
Fox Hills Sandstone:			
	Clay; with sand	67	262
	Water sand	8	270

151-077-01DDD
Test hole 1071
(Log modified from Adolphson, 1961)

Altitude: 1556 feet — Date drilled: 9/20/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Clay, smooth, light-gray	7	7
Glacial drift:			
	Sand, fine to medium	8	15
	Sand, medium to coarse, and large lignite fragments	10	25
	Sand, medium to coarse	11	36
	Till, gray, and fine to medium gravel	7	43
Cannonball Member:			
	Clay, smooth, gray	17	60

151-077-02AAC
Missile Site A-4
(Log modified from E. J. Longyear Drilling Co.)

Altitude: 1574 feet — Date drilled: 5/11/61

Glacial drift:			
	Till, yellowish-brown, silty	18	18
	Till, dark-gray, sandy	5	23
	Silt, dark-gray, sandy; thin interbedded lenses of clay	28	51
Cannonball Member:			
	Shale, gray, silty	22	73
	Siltstone, dark-gray, clayey	16	89
	Siltstone, dark-gray; interbedded with sandstone and shale	10	99
	Shale, gray, silty to sandy	3	102

151-077-02CCC
Test hole 1073
(Log modified from Adolphson, 1961)

Altitude: 1620 feet — Date drilled: 9/27/55

Glacial drift:			
	Till, sandy, yellow	6	6
	Till, yellow, and fine to medium gravel	35	41
Cannonball Member:			
	Clay, sandy, gray	19	60
	Clay, smooth, gray	10	70

151-077-02DDD
Test hole 1072
(Log modified from Adolphson, 1961)

Altitude: 1592 feet — Date drilled: 9/22/55

Glacial drift:			
	Till, yellow, and fine to medium gravel	10	10
	Till, dark-brown, and fine to medium gravel	7	17
Cannonball Member:			
	Clay, sandy, dark-brown	20	37
	Sand, fine to medium, dark-brown	4	41
	Clay, sandy, dark-brown	6	47
	Clay, smooth, light-gray	13	60

151-077-05CBC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1612 feet	Date drilled:	7/12/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	0.6	0.6
	Till, brown, silty, sandy	7.4	8
	Sand, brown, fine, silty	4	12
	Till, brown and gray, silty, sandy, slightly oxidized; gypsum at 13 feet	5	17
	Sand, brown and gray, fine, silty	2	19
Cannonball Member:			
	Shale, gray to black, silty; lenses of fine micaceous sand	11	30

151-077-05DCC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1609 feet	Date drilled:	12/05/69
Glacial drift:			
	Topsoil, dark-brown, sandy	0.5	0.5
	Till, dark-brown, silty, sandy, oxidized; limey zones	6	6.5
	Sand, brown, silty, loose; estimate 80 percent fine sand and 20 percent nonplastic fines; trace of clay to slightly clayey with depth	6	12.5
	Till, brown, silty, sandy, oxidized	3.5	16
	Sand, brown, clayey; estimate 85 to 95 percent fine to medium sand and 5 to 15 percent low plasticity to moderately plastic fines; few lignite fragments	3	19
	Till, gray, sandy, silty	7.5	26.5
Cannonball Member:			
	Sandstone, dark-gray to black, clayey	23.5	50

151-077-06ACB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1616 feet	Date drilled:	12/09/69
Glacial drift:			
	Topsoil, dark-brown, sandy, silty	1.5	1.5
	Till, brown, silty	8.5	10
	Till, brown, oxidized; with gray-brown zones	16	26
	Sand, clayey; brown to 31 feet; gray below; oxidized to 31 feet; estimate 75 percent fine to coarse sand and 20 percent slightly plastic to moderately plastic fines	8	34
Cannonball Member:			
	Shale, gray; fine sand increasing near bottom	16	50

151-077-06BBA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1607 feet — Date drilled: 12/09/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, dark-brown	1	1
	Till, brown; becoming gray at 15 feet	15	16
Cannonball Member:			
	Shale, gray; variable sand, silt, and clay content with fine sand increasing below 45 feet	34	50

151-077-08AAA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1622 feet — Date drilled: 7/11/55

Glacial drift:			
	Till, brown, silty, sandy	4	4
	Sand, brown to tan, silty, clayey, fairly well graded; approximately 5 to 10 percent fine to medium gravel	12.7	16.7
	Till, buff, silty, sandy	2.8	19.5
	Sand, buff, fine and medium, silty; occasional clayey zones to 25 feet	10.5	30
	Till, brown, silty, sandy	10	40

151-077-09BBD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1610 feet — Date drilled: 12/05/69

	Topsoil, dark-brown	1	1
	Till, brown, sandy, silty, oxidized	18.5	19.5
	Sand, tan to brown, silty; estimate 80 to 85 percent predominantly fine sand and 15 to 20 percent nonplastic fines; slightly clayey in zones	9.5	29
	Sand, gray, silty; estimate 85 to 90 percent coarse to predominantly fine sand and 10 to 15 percent nonplastic fines; few fine gravels with cobbles and boulders from 45 to 47 feet	18	47
Cannonball Member:			
	Shale, gray to black	3	50

151-077-09DBA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1619 feet — Date drilled: 12/04/69

Glacial drift:			
	Topsoil	1	1
	Till, brown, oxidized	13.1	14.1
	Sand, tan, silty; estimate 60 percent fine sand and 40 percent nonplastic fines	2.4	16.5
	Till, brown, sandy, silty, oxidized	8.5	25
	Sand, brown; estimate 95 percent fine to medium sand and 5 percent fines	3	28
	Till, brown, oxidized	7	35
	Sand, gray, silty; estimate 50 to 55 percent fine sand and 45 to 50 percent nonplastic fines; laminated; some laminations are lignitic	15	50

151-077-10BBB
NDSWC 10188

Altitude: 1560 feet — Date drilled: 8/10/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand, very fine to very coarse; about 20 percent fine to medium gravel; subrounded to rounded; oxidized	9	9
	Sand, fine to medium, subrounded	7	16
	Clay, medium-gray, silty to sandy	2	18
	Sand, fine to coarse, gravelly, subrounded	9	27
Cannonball Member:			
	Sandstone, greenish-gray, fine, clayey	2	29
	Shale, dark-brownish-black, silty; interbedded with thin lenses of fine sandstone	31	60

151-077-14CBA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1617 feet — Date drilled: 11/21/69

Glacial drift:			
	Topsoil	1	1
	Clay, light-brown, silty	1	2
	Sand, brown, silty; predominantly fine sand with nonplastic fines	1	3
	Till, yellowish-brown, oxidized; with gypsum and(or) anhydrite present along joints in upper 10 to 12 feet	17	20
	Sand, yellowish-brown, silty; predominantly fine with nonplastic fines	3	23
	Sand, yellowish-brown, medium; with fine gravel and nonplastic fines	4.5	27.5
	Till, yellowish-brown, sandy, silty	2.5	30
	Sand, yellowish-brown, gravelly; contains nonplastic fines	2.5	32.5
Cannonball Member:			
	Shale, gray to brown, unconsolidated, firm	9.5	42
	Siltstone, light-gray, sandy, unconsolidated, soft	8	50

151-077-14CDC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1612 feet — Date drilled: 7/08/55

Glacial drift:			
	Topsoil	1.4	1.4
	Till, brown, silty, sandy; becoming gray at 14 feet; oxidized to 14 feet	13.6	15
Cannonball Member:			
	Sandstone, gray, micaceous, silty, clayey, impervious, hard, compact	15	30

151-077-14CDD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1616 feet	Date drilled:	11/20/69
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, dry	0.7	0.7
	Sand, light-gray to light-brown, fine, silty; carbonate concretions	5.8	6.5
	Till, yellowish-brown, sandy, silty, oxidized	2	8.5
	Sand, yellowish-brown, fine	1.5	10
	Till, yellowish-brown, sandy, silty	4	14
Cannonball Member:			
	Siltstone, gray, unconsolidated, moderately firm; iron-oxide coating to 17 feet; saturated; fine sandy zones between 30 and 32, 35 and 37, and 40 and 48 feet; trace of clay	36	50

151-077-15ACD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1616 feet	Date drilled:	12/03/69
Glacial drift:			
	Clay, grayish-brown, silty	8	8
	Till, brown, sandy, silty; oxidized to 15 feet	12	20
	Sand, silty; brown to 30 feet; gray below; estimate 70 to 80 percent predominantly fine sand with some medium and coarse grains and 20 to 30 percent nonplastic fines; occasional gravel; trace of clay	15	35
	Sand, gray, clayey; fine to coarse with few fine gravels from 48 to 50 feet; estimate 60 to 80 percent predominantly fine sand and 20 to 40 percent slightly plastic to moderately plastic fines	15	50

151-077-15BAC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1614 feet	Date drilled:	12/03/69
Glacial drift:			
	Topsoil, dark-brown, silty, sandy	0.5	0.5
	Till, brown, sandy, silty, oxidized	10.5	11
	Sand, tan to brown, silty; estimate 75 percent fine sand with little medium and coarse from 20 to 25 feet and 25 percent nonplastic fines; clayey in zones; lignite slack concentration at 23 feet	18	29
	Clay, dark-gray, moderately to highly plastic; thin sandy laminations at 29.5 feet	1	30
	Sand, gray, clayey, silty, estimate 80 percent coarse to fine sand and 20 percent low plasticity to moderately plastic fines	2	32
	Sand, gray, silty, cohesive; estimate 70 percent fine sand and 30 percent nonplastic to moderately plastic fines	18	50

151-077-15BBB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1609 feet — Date drilled: 7/11/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1.5	1.5
	Till, silty, sandy	18.5	20
Cannonball Member:			
	Shale, brown and gray, silty, slightly oxidized; traces of very fine sand	8	28
	Shale, gray, silty, slightly plastic, hard	2	30

151-077-18CCB
Missile Site A-7
(Log modified from J. N. Pitcher Drilling Co.)

Altitude: 1643 feet — Date drilled: 4/18/61

Glacial drift:			
	Sand, medium, silty, oxidized	5	5
	Clay, brownish-gray, silty to sandy	2	7
	Till, grayish-brown, silty, oxidized	18	25
	Till, dark-gray, silty	14	39
Cannonball Member:			
	Siltstone, dark-gray, clayey	15	54
	Siltstone and sandstone, dark-gray	18	72
	Shale, gray, silty	7	79
	Sandstone, gray, silty	12	91
	Siltstone, gray, sandy, clayey	9	100

151-077-23ABD
(Log modified from U.S. Bureau of Reclamation)

Altitude. 1613 feet — Date drilled: 11/20/69

Glacial drift:			
	Topsoil	1	1
	Sand, dark-brown, fine, silty	3	4
	Sand, brown, fine, silty	5	9
Cannonball Member:			
	Shale, light-gray, highly plastic, soft	3	12
	Sandstone, yellowish-brown, fine, unconsolidated	1	13
	Siltstone, medium-gray, unconsolidated; firm to soft where sandy; clay laminations, claystone horizon from 15 to 17 feet; silty sandstone from 30 to 36 feet	28	41
	Limestone, dark-gray, silty, moderately cemented, hard	3	44
	Siltstone, gray, unconsolidated, firm; clay laminations	6	50

151-077-24CBC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1618 feet — Date drilled: 7/08/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	0.6	0.6
	Till, buff, silty, sandy, oxidized	9.6	10.2
	Till, gray, silty, sandy	1	11.2
	Sand, gray, fine, silty	.9	12.1
	Till, gray, silty, sandy	1	13.1
	Sand, gray, fine, silty	16.9	30

151-077-24CDA
(Log modified from U.S. Bureau of Reclamation)

Altitude. 1619 feet — Date drilled: 11/19/69

Glacial drift:			
	Till, dark-brown, sandy, silty	6	6
	Clay, yellowish-brown, sandy, silty, firm; scattered fine gravel and lignite fragments throughout	4	10
	Sand, gray, fine to coarse, and fine gravel	4.5	14.5
	Till, gray	2.5	17
	Sand, gray, fine	10	27
	Till, gray, sandy; gravelly from 35 to 38 feet	11	38
Cannonball Member:			
	Shale, black, unconsolidated, soft	5	43
	Sandstone, gray, fine, silty, unconsolidated	7	50

151-077-29ADD
(Log modified from Russell Drilling Co.)

Altitude: 1663 feet — Date drilled: 4/16/65

Glacial drift:			
	Sand and gravel	12	12
	Blue clay	11	23
	Silty sand and gravel	21	44
	Blue clay	49	93
Cannonball Member:			
	Hard sandrock	4	97
	Blue clay	92	189
Hell Creek Formation.			
	Gray fairly hard water sand	16	205
	Blue clay	2	207

151-077-35BBB
NDSWC 10187

Altitude. 1655 feet — Date drilled: 8/10/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty to sandy, oxidized	13	14
	Till, medium-gray, very silty to sandy	6	20
Cannonball Member:			
	Sandstone, light-gray, very fine to fine, well-indurated	4	24
	Shale, dark-brownish-black, carbonaceous; interbedded with lenses of very fine clayey sandstone	36	60

151-078-01AAA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1614 feet — Date drilled: 7/12/55

Glacial drift:			
	Till, brown, silty, sandy	1.7	1.7
	Sand, brown, fine, silty	1	2.7
	Till, brown, silty, sandy	8.8	11.5
	Sand, brown, fine to medium, silty	1	12.5
	Till, brown, silty, sandy, gravelly, oxidized to 15 feet	2.9	15.4
	Sand, brown, fine to medium; trace of silt; approximately 10 percent gravel	1.5	16.9
	Sand, brown and gray, fine to medium, silty; becoming gray at 20 feet; till finger from 16.9 to 17.1 feet; fine sand from 21 to 22 feet; slightly oxidized to 20 feet	5.1	22
Cannonball Member:			
	Shale, gray to black, organic, silty; with very fine sandy seams	8	30

151-078-09BBB
NDSWC 10082

Altitude: 1600 feet — Date drilled: 11/16/77

Glacial drift:			
	Topsoil, brown, sandy	1	1
	Clay, yellowish-brown, silty to very sandy, oxidized	8	9
	Till, medium-gray, silty to sandy	12	21
	Sand, fine to medium, subangular	3	24
	Till, medium-gray, silty, pebbly	2	26
	Sand, fine to medium, subangular to subrounded	2	28
	Till, dark-gray, sandy	15	43
Cannonball Member:			
	Sandstone, greenish-gray, fine to medium, silty, indurated	17	60

151-078-10ABB
NDSWC 10081

Altitude: 1600 feet — Date drilled: 11/16/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brown	1	1
	Till, yellowish-brown, silty, oxidized	5	6
	Sand, fine to medium, silty	2	8
	Till, medium-gray, silty	6	14
Cannonball Member:			
	Shale, dark-brownish-gray, carbonaceous; interbedded with greenish-gray fine clayey sandstone	26	40

151-078-14AAC
(Log modified from Russell Drilling Co.)

Date drilled: 7/13/65

Glacial drift:			
	Quicksand and gravel	35	35
	Blue clay	60	95
Cannonball Member:			
	Fine sand	10	105
	Hard sand	2	107
	Sand and clay	8	115
	Clay	45	160
	Soft coal	20	180
	Good water sand	35	215

151-078-16CCB
NDSWC 10084

Altitude: 1610 feet — Date drilled: 11/17/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, oxidized	21	22
	Till, medium-gray, silty to sandy	40	62
	Sand, fine to medium, gravelly, subangular	26	88
	Clay, dark-gray, sandy	28	116
	Till, medium-gray, silty	38	154
	Sand, fine to medium, very clayey	16	170
Hell Creek Formation:			
	Shale, dark-gray, silty; carbonaceous streaks	10	180

151-078-17AAA
NDSWC 10083

Altitude: 1600 feet — Date drilled: 11/16/77

Glacial drift:			
	Topsoil, brown, sandy	1	1
	Sand, very fine to medium, silty, clayey, oxidized	10	11
	Clay, medium-gray, silty to sandy	41	52
	Till, medium-dark-gray, sandy	70	122
	Sand, fine to medium; about 20 percent fine subangular gravel	11	133
	Till, medium-gray, sandy	9	142
	Cobbles and boulders	2	144
	Till, medium-gray, silty	13	157
	Cobbles and boulders	3	160
Hell Creek Formation:			
	Shale, dark-grayish-brown, silty, carbonaceous	20	180

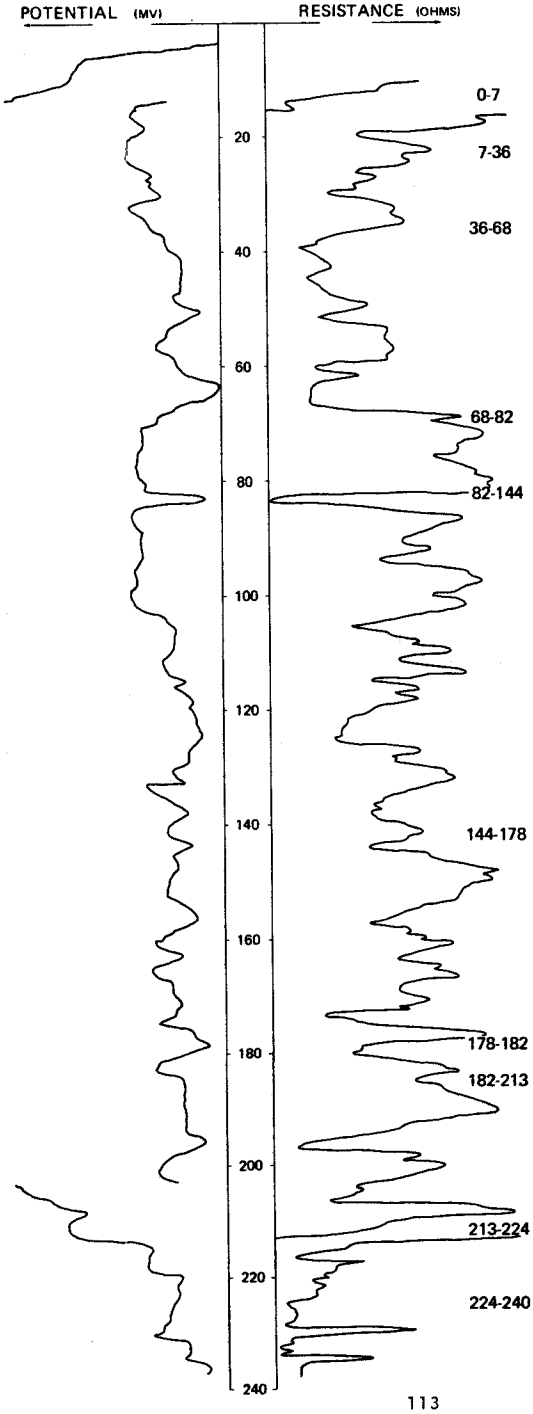
NDSWC 10196

LOCATION: 151-078-21CBB1

DATE DRILLED: 8/11/78

ALTITUDE: 1620
(FT, NGVD)

DEPTH: 240
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-7	Clay, yellowish-brown, silty to sandy, oxidized.
7-36	Gravel, fine to coarse; about 40 percent very fine to medium sand; subangular to rounded; oxidized.
36-68	Till, brownish-gray, silty to sandy.
68-82	Sand, very fine to medium, silty.
82-144	Silt, dark-gray, silty to clayey.
144-178	Sand, fine to very coarse, gravelly; some lenses of clayey silt.
178-182	Clay, dark-gray, silty to sandy.
182-213	Gravel, fine to medium; about 40 percent very fine to very coarse sand; subrounded to rounded; lenses of clay from 196 to 198 and 204 to 206 feet.

HELL CREEK FORMATION

213-224	Sandstone, medium-grayish-green, clayey, poorly indurated.
224-240	Siltstone, dark-gray; interbedded with thin lenses of indurated sandstone.

151-078-21CBB2
(Log modified from Nick Erck Well Drilling)

Date drilled: 11/06/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Black topsoil	1	1
	Yellow clay sand	25	26
	Sand; coal	23	49
	Muddy sand	20	69
	Sand	7	76

151-078-22DDD
NDSWC 10195

Altitude: 1604 feet — Date drilled: 8/10/78

Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized	10	11
	Till, olive-gray, silty	17	28
	Sand, fine to medium, oxidized	2	30
	Till, medium-gray, silty	6	36
Cannonball Member:			
	Sandstone, medium-gray, fine to medium, well-indurated	1	37
	Sandstone, greenish-gray, fine to medium; interbedded with grayish-brown clayey siltstone; carbonaceous streaks	23	60

151-078-27CDC
(Log modified from Mariner Drilling Service)

Date drilled: 10/26/74

Glacial drift:			
	Surface soil	1	1
	Yellow clay	13	14
	Blue clay; rocks	17	31
	Sand, gravel, and water	10	41

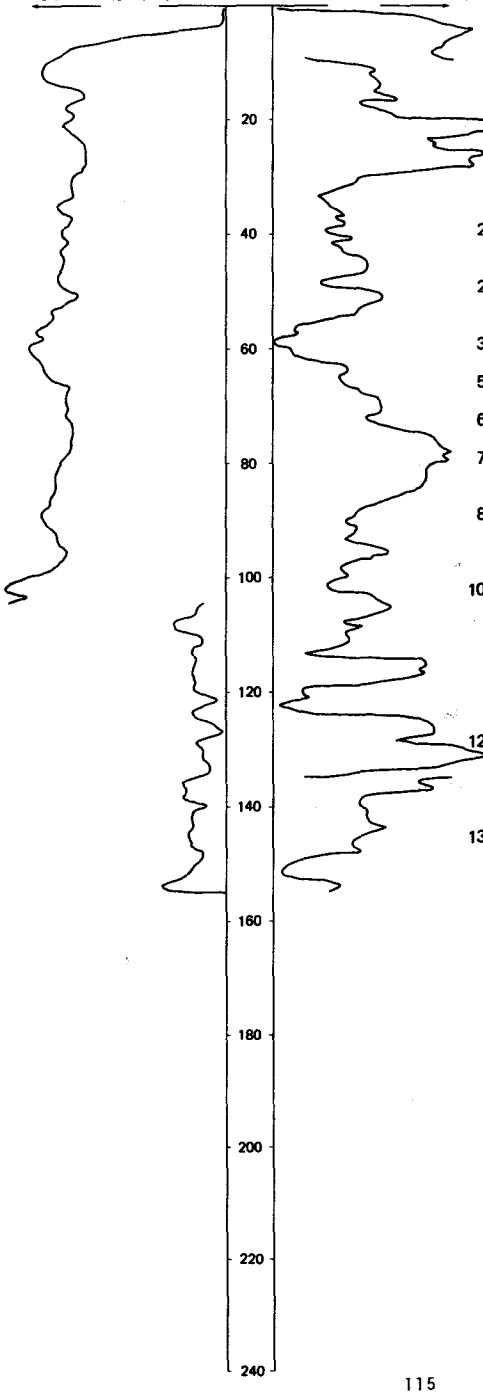
NDSWC 10217

LOCATION: 151-078-28ACB

DATE DRILLED: 8/17/78

ALTITUDE: (FT, NGVD) 1630

DEPTH: (FT) 160



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black, sandy.
1-8	Sand, very fine to coarse, mostly coarse, oxidized.
8-20	Till, olive-brown, very silty to sandy, oxidized.
20-26	Silt, dark-gray, very sandy, clayey; abundant detrital lignite.
26-30	Sand, very fine to very coarse, gravelly, subrounded.
30-54	Till, dark-gray, very silty to sandy.
54-64	Clay, dark-gray, silty.
64-74	Clay, dark-gray, silty to very sandy.
74-88	Sand, very fine to coarse, slightly silty.
88-103	Clay, medium-gray, very silty to sandy.
103-127	Till, dark-gray, silty to very sandy.
127-138	Till, dark-gray, very sandy to gravelly.

CANNONBALL MEMBER

138-160	Shale, dark-brown, carbonaceous; interbedded with grayish-green sandy siltstone; carbonaceous streaks.

151-078-29BB
(Log modified from Russell Drilling Co.)

Altitude: 1630 feet — Date drilled: 11/18/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Yellow sandy clay	4	5
	Dark sand; fine	10	15
	Gray till	3	18
	Gravel	2	20
	Rock	2	22
	Gravel and sand; with till layers	10	32
Cannonball Member:			
	Shale	30	62

151-078-33DCB
Missile Site A-8
(Log modified from J. N. Pitcher Drilling Co.)

Altitude: 1685 feet — Date drilled: 4/18/61

Glacial drift:			
	Sand, fine to coarse, and fine brown oxidized gravel	15	15
	Sand, fine, brown, oxidized	7	22
	Silt, gray, clayey; detrital lignite	10	32
	Sand, fine to medium, brown	6	38
	Sand, fine to coarse, gray, gravelly; some silty clay lenses	20	58
	Silt, gray, sandy, clayey	11	69
	Till, dark-gray, silty	6	75
Cannonball Member:			
	Siltstone, grayish-brown; interbedded with lenses of sandstone and shale	9	84
	Shale, light-gray to black, silty; interbedded with thin lenses of sandstone	16	100

151-078-34BCC
(Log modified from Mariner Drilling Service)

Date drilled: 10/28/74

Glacial drift:			
	Surface	1	1
	Yellow clay	19	20
	Blue clay	13	33
	Gravel, rocks, and water	3	36

151-078-36DDA
NDSWC 10218

Altitude:	1631 feet	Date drilled:	8/17/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brown, sandy	1	1
	Sand, very fine to coarse, subrounded to rounded, oxidized	4	5
	Till, light-olive-brown, silty to sandy, oxidized	19	24
	Till, dark-gray, very silty to sandy, gravelly	4	28
	Sand, medium to coarse, subrounded	1	29
	Till, dark-gray, sandy, gravelly	2	31
Cannonball Member:			
	Sandstone, medium-grayish-brown, very fine, silty; interbedded with brownish-black carbonaceous shale	29	60

151-079-04BBB
NDSWC 10202

Altitude.	1630 feet	Date drilled:	8/15/78
Glacial drift:			
	Clay, medium-olive-brown, silty, oxidized	2	2
	Gravel, fine to medium; about 40 percent very fine to very coarse sand; subrounded to rounded; oxidized	7	9
	Clay, medium-olive-brown, silty to sandy, oxidized	7	16
	Clay, grayish-black, silty to sandy	4	20
	Sand, medium-gray, very fine to fine, silty to clayey	18	38
	Gravel, fine; about 40 percent coarse to very coarse sand	8	46
	Clay, dark-gray, very silty to sandy	13	59
	Gravel, fine; about 30 percent fine to very coarse sand; interbedded with thin lenses of silty clay	22	81
	Clay, grayish-brown, very silty to sandy	10	91
	Gravel, fine to medium, sandy; interbedded with thin lenses of silty clay	3	94
Cannonball Member:			
	Shale, medium-dark-gray; interbedded with thin lenses of medium-gray silty sandstone	26	120

151-079-05ADD
NDSWC 10204

Altitude:	1638 feet	Date drilled:	8/15/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to very coarse; about 20 percent very fine gravel; oxidized	4	4
	Clay, yellowish-brown, very silty to sandy	12	16
	Till, yellowish-brown, silty to sandy; with thin lenses of gravel; oxidized	5	21
	Till, dark-gray, very silty to sandy, gravelly	17	38
Cannonball Member:			
	Shale, dark-gray, brittle; interbedded with lenses of very fine silty to clayey sandstone	22	60

151-079-05CBB
Missile Site B-5
(Log modified from J. N. Pitcher Drilling Co.)

Altitude:	1654 feet	Date drilled:	4/18/61
Glacial drift:			
	Till, grayish-brown, silty to sandy	9	9
	Till, grayish-brown, silty	15	24
	Clay, dark-gray, silty to sandy	15	39
	Silt and clay, dark-gray	4	43
	Sand, fine, dark-gray, silty	3	46
	Silt and clay, dark-gray, sandy	8	54
	Till, dark-gray, silty	24	78
Cannonball Member:			
	Shale, dark-gray; interbedded with siltstone	18	96
	Shale, dark-gray, silty	4	100

151-079-08AAA
NDSWC 10203

Altitude:	1665 feet	Date drilled:	8/15/78
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, very silty to sandy, oxidized	17	18
	Till, dark-gray, very silty to sandy, gravelly	24	42
Cannonball Member:			
	Shale, dark-grayish-brown, brittle; interbedded with lenses of very fine silty sandstone	18	60

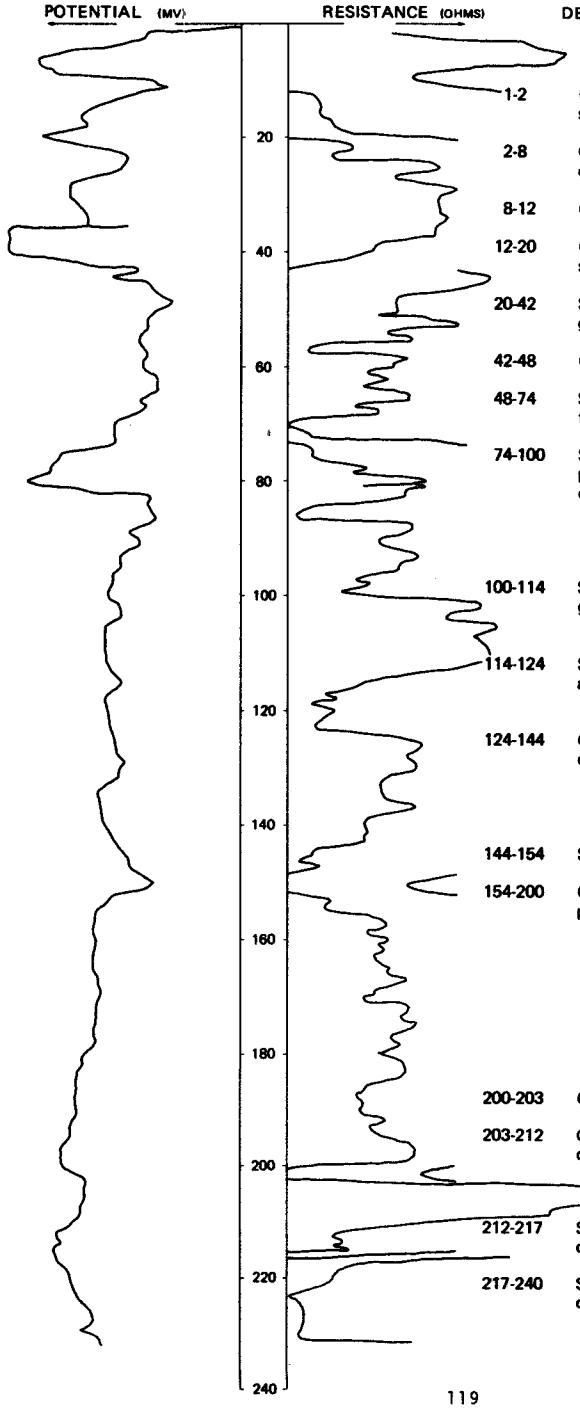
NDSWC 10197

LOCATION: 151-079-12BBB

DATE DRILLED: 8/14/78

ALTITUDE: 1615
(FT, NGVD)

DEPTH: 240
(FT)



	DESCRIPTION OF DEPOSITS
	GLACIAL DRIFT
1-2	Clay, yellowish-brown, silty to sandy, oxidized.
2-8	Gravel, fine to medium, sandy, oxidized.
8-12	Clay, yellowish-brown, oxidized.
12-20	Clay, yellowish-brown, silty to sandy, oxidized.
20-42	Sand, very fine to very coarse, gravelly, subrounded to rounded.
42-48	Clay, brownish-gray, silty to sandy.
48-74	Sandstone, light-gray, very fine to fine; shove block.
74-100	Silt, grayish-brown; about 30 percent very fine to fine sand; clayey.
100-114	Sand, very fine to very coarse, gravelly.
114-124	Sand, very fine to very coarse, silty; abundant detrital lignite.
124-144	Gravel, fine; about 20 percent coarse to very coarse sand.
144-154	Sand, fine to very coarse, silty.
154-200	Gravel, fine to medium; about 30 percent medium to coarse sand.
200-203	Clay, dark-gray, silty to sandy.
203-212	Gravel, medium to very coarse, clayey; cobbles and boulders.
	HELL CREEK FORMATION
212-217	Sandstone, light-gray, fine, silty, clayey.
217-240	Shale, grayish-brown, fissile; carbonaceous streaks.

151-079-14AAA
NDSWC 10198

Altitude: 1626 feet — Date drilled: 8/14/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty to sandy, oxidized	8	9
	Sand, very fine to very coarse, silty; about 10 percent fine gravel; subangular to rounded	21	30
	Till, medium-gray, very silty to sandy	6	36
Cannonball Member:			
	Sandstone, light-gray, fine to medium, poorly indurated	14	50
	Sandstone, medium-gray, fine, clayey, partially indurated	20	70
	Sandstone, medium-dark-gray, fine, cemented	2	72
	Sandstone, light-gray, very fine to fine, partially indurated	8	80

151-079-20BBB
NDSWC 10216

Altitude: 1765 feet — Date drilled: 8/17/78

Glacial drift:			
	Sand, fine to very coarse; about 20 percent fine gravel; subrounded to rounded; oxidized	16	16
	Clay, olive-brown, silty to sandy, oxidized	8	24
	Till, olive-brown, silty to sandy, oxidized	10	34
	Gravel, fine to medium; about 40 percent coarse to very coarse sand; oxidized	10	44
	Till, medium-gray, silty to sandy	3	47
	Sand, fine to coarse, gravelly, subrounded to rounded	11	58
	Clay, dark-gray, silty	1	59
	Sand, fine to very coarse, gravelly, subrounded	5	64
	Till, dark-gray, silty to sandy	17	81
	Sand, fine to coarse, gravelly, subangular	5	86
	Till, dark-gray, silty to sandy	16	102
Tongue River Member:			
	Sandstone, light-gray, very fine to fine, indurated; interbedded with lenses of medium-gray silty shale	18	120

151-079-33BBB
Missile Site B-6
(Log from J. N. Pitcher Drilling Co.)

Altitude:	1824 feet	Date drilled:	4/19/61
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial till:			
	Till, brown, silty, oxidized	19	19
	Till, gray-brown, silty	22	41
	Till, dark-gray, silty	38	79
	Sand, fine, silty	1	80
	Till, dark-gray, silty	20	100

151-080-02CDD
NDSWC 10213

Altitude:	1760 feet	Date drilled:	8/16/78
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty to sandy, oxidized	11	12
Tongue River Member:			
	Shale, dark-brownish-black, silty, carbonaceous, brittle	1	13
	Sandstone, greenish-gray to light-gray, very fine to fine, indurated; becoming more cemented with depth	27	40

151-080-04CCB
(Log from North Dakota Geological Survey)

Altitude:	1860 feet	Date drilled:	7/22/70
Glacial drift:			
	Till, tan, silty, sandy	14	14
	Till, olive-gray	15	29
	Sand, very silty or clayey	5	34
	Till, bluish-gray and rusty-brown, stony, sandy	15	49

151-080-04CCC
NDSWC 10211

Altitude:	1866 feet	Date drilled:	8/16/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, very silty to sandy, oxidized	4	5
	Sand, fine to medium, gravelly, subangular, oxidized	1	6
	Till, olive-gray, sandy, oxidized	18	24
	Till, medium-gray, sandy, very silty	42	66
	Sand, fine to very coarse, gravelly, subangular to rounded	3	69
	Till, medium-gray, very sandy to gravelly	9	78
	Shale, dark-brown; shove block	3	81
	Till, medium-gray, silty	19	100
	Gravel, fine to medium; cobbles; about 40 percent coarse to very coarse sand	6	106
Tongue River Member:			
	Sandstone, light-gray, very fine to fine, cemented	1	107
	Sandstone, light-gray, very fine to medium, clayey, poorly indurated	13	120

151-080-09CCB
Missile Site B-1
(Log modified from E. J. Longyear Drilling Co.)

Altitude:	1930 feet	Date drilled:	4/18/61
Glacial drift:			
	Till, brown, silty, oxidized	13	13
	Till, grayish-brown, silty	5	18
	Sand, fine, brown	10	28
	Silt, brown, sandy	5	33
	Sand, fine to medium, brown, silty	10	43
	Clay, dark-gray, silty, lignitic	4	47
	Till, dark-gray, silty	51	98
Tongue River Member:			
	Siltstone, gray, clayey, sandy	3	101

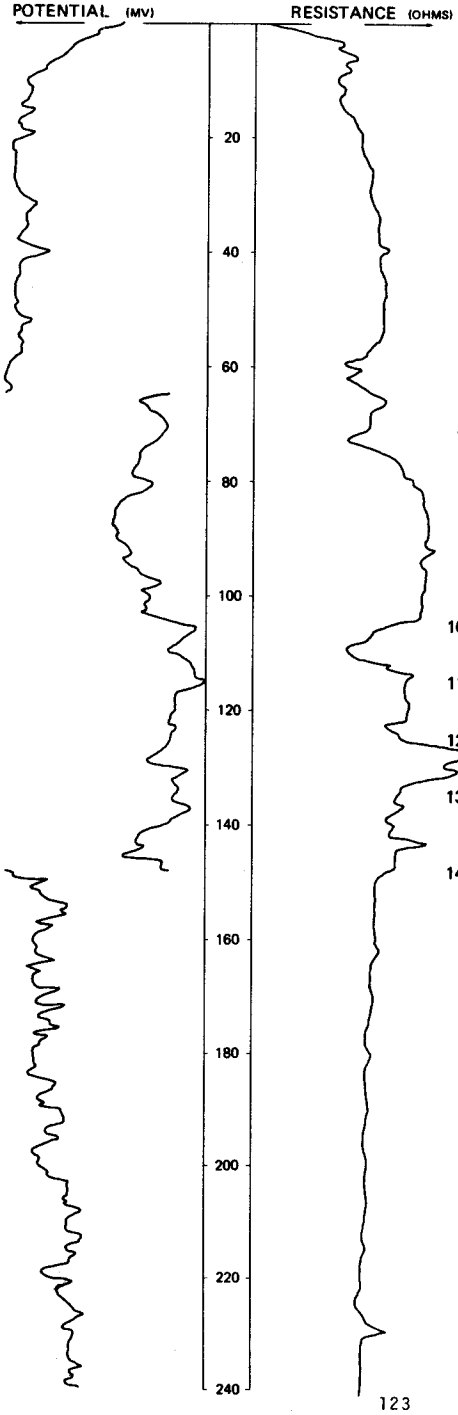
NDSWC 10212

LOCATION: 151-080-17DCC

DATE DRILLED: 8/16/78

ALTITUDE: 2013
(FT, NGVD)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

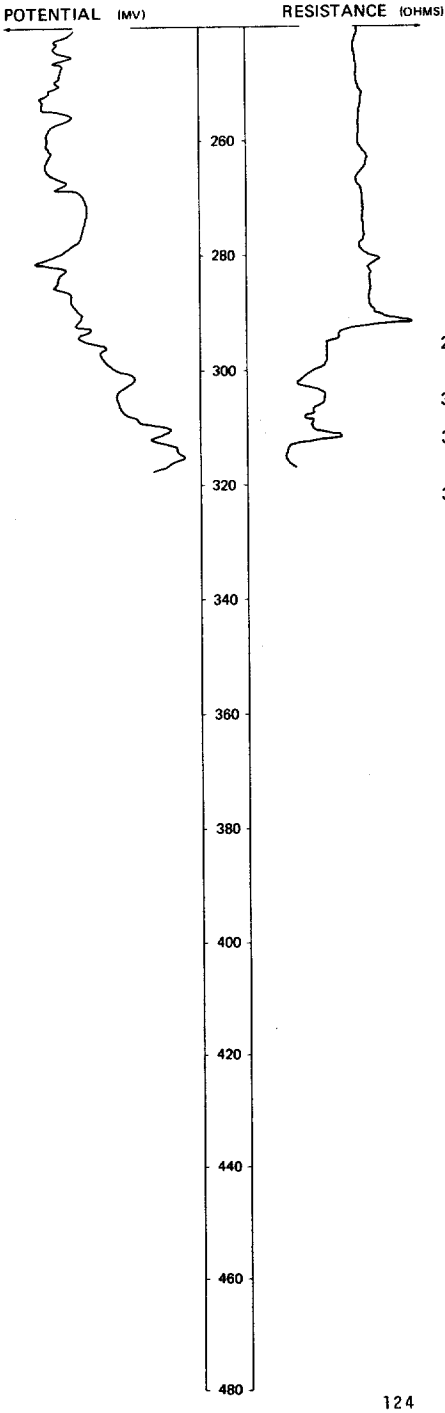
0-1	Topsoil, brownish-black.
1-30	Clay, yellowish-brown, silty to sandy, oxidized.
30-35	Till, olive-brown, very silty, oxidized.
35-59	Till, dark-gray, very silty to sandy.
59-73	Clay, dark-grayish-brown, silty, compact.
73-106	Silt, grayish-brown, slightly clayey.
106-112	Clay, grayish-brown, silty, moderately compact.
112-124	Till, dark-gray, very silty and sandy.
124-132	Sand, fine to very coarse, silty, subrounded.
132-148	Till, dark-gray, very silty to sandy; abundant detrital lignite.
148-293	Till, dark-gray; silty to sandy intervals.

LOCATION: 151-080-17DCC

DATE DRILLED: 8/16/78

ALTITUDE: (FT, NGVD) 2013

DEPTH: (FT) 320



DESCRIPTION OF DEPOSITS

TONGUE RIVER MEMBER

293-300	Sandstone, light-gray, very fine, clayey.
300-304	Shale, grayish-brown, silty, fissile.
304-310	Sandstone, medium-gray, fine, slightly indurated.
310-320	Shale, brownish-gray, compact.

151-080-24CBC
(Log modified from Donald & Keith Erck Well Drilling, Inc.)

Date drilled: 5/02/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Yellow clay	27	28
	Blue clay	55	83
	Blue gravelly clay	12	95
Tongue River Member:			
	Blue clay	63	158
	Sandstone	1	159

151-080-25CCC
NDSWC 10214

Altitude: 1925 feet — Date drilled: 8/16/78

	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty to sandy, oxidized	5	6
	Clay, olive-brown, silty to very sandy, oxidized	10	16
	Till, dark-grayish-brown, very silty	6	22
	Sand, very fine to medium, silty, rounded	7	29
	Clay, dark-grayish-brown, silty	13	42
	Till, dark-gray, very silty to sandy	51	93
	Sand, fine to coarse, gravelly	4	97
	Till, dark-gray, very sandy	6	103
	Till, dark-gray, gravelly	7	110
	Till, dark-gray, sandy to gravelly; some cobbles from 160 to 172 feet	62	172
Tongue River Member:			
	Sandstone, light-gray, fine to medium, moderately indurated	8	180

151-080-25DDC
NDSWC 10215

Altitude: 1885 feet — Date drilled: 8/17/78

Glacial drift:			
	Topsoil, brown, gravelly	1	1
	Gravel, fine to coarse, sandy, oxidized	3	4
	Till, yellowish-brown, oxidized; some cobbles at 23 feet	20	24
	Till, dark-gray; cobbles and boulders at 135 feet	126	150
Tongue River Member:			
	Sandstone, light-bluish-gray to medium-bluish-gray, very fine to fine, clayey, poorly indurated	30	180

151-080-32DDD
(Log modified from Mariner Drilling Service)

Date drilled: 4/29/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Surface	1	1
	Yellow clay	44	45
	Blue clay	6	51
	Gravel, sand, and some water	3	54
	Blue clay	71	125
	Gravel and rocks	2	127
	Blue clay	8	135
	Rocks, gravel, and slate	22	157
	Brown hard clay	24	181
	Coal	25	206
	Water	---	206

151-080-33CBB
(Log from North Dakota Geological Survey)

Altitude: 2150 feet — Date drilled: 7/22/70

Glacial till:			
	Till, tan	3	3
	Till, tan; water	1	4
	Till, brown	15	19
	Till, brown to gray	5	24
	Till, gray	5	29

152-075-04AAA
NDSWC 10181

Altitude: 1545 feet — Date drilled: 8/09/78

Glacial drift:			
	Sand, very fine to coarse, subrounded to rounded, oxidized	3	3
	Gravel, very fine to fine; about 20 percent medium to very coarse sand; subangular to rounded; oxidized	2	5
Hell Creek Formation:			
	Sandstone, light-gray, very fine, clayey; interbedded with dark-brown carbonaceous siltstone	15	20

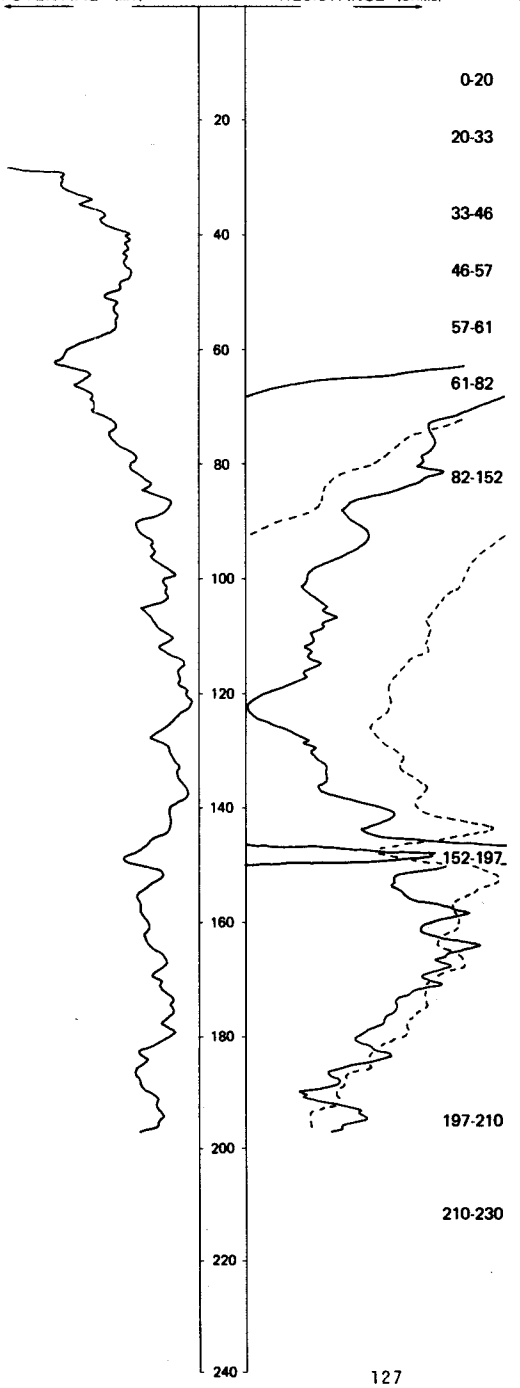
NDSWC 5001

LOCATION: 152-075-07BBB

DATE DRILLED: 9/29/76

ALTITUDE: (FT. NGVD) 1570

DEPTH: (FT) 230



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20	Till, yellowish-brown, silty to gravelly, oxidized.
20-33	Sand, fine to very coarse; about 20 percent fine to coarse gravel; sub-angular to subrounded; oxidized.
33-46	Till, olive-gray, sandy to gravelly.
46-57	Gravel, fine to very coarse, angular to subrounded, poorly sorted.
57-61	Clay, medium-dark-gray, silty to sandy.
61-82	Sand, very fine to medium, sub-rounded to rounded.
82-152	Till, medium-dark-gray, silty to very sandy.
152-197	Sand, medium to very coarse; about 30 percent fine to coarse gravel; angular to subrounded.
197-210	Till, medium-dark-gray, silty to gravelly.

FOX HILLS SANDSTONE

210-230	Siltstone, greenish-gray, slightly sandy, very tight, brittle.

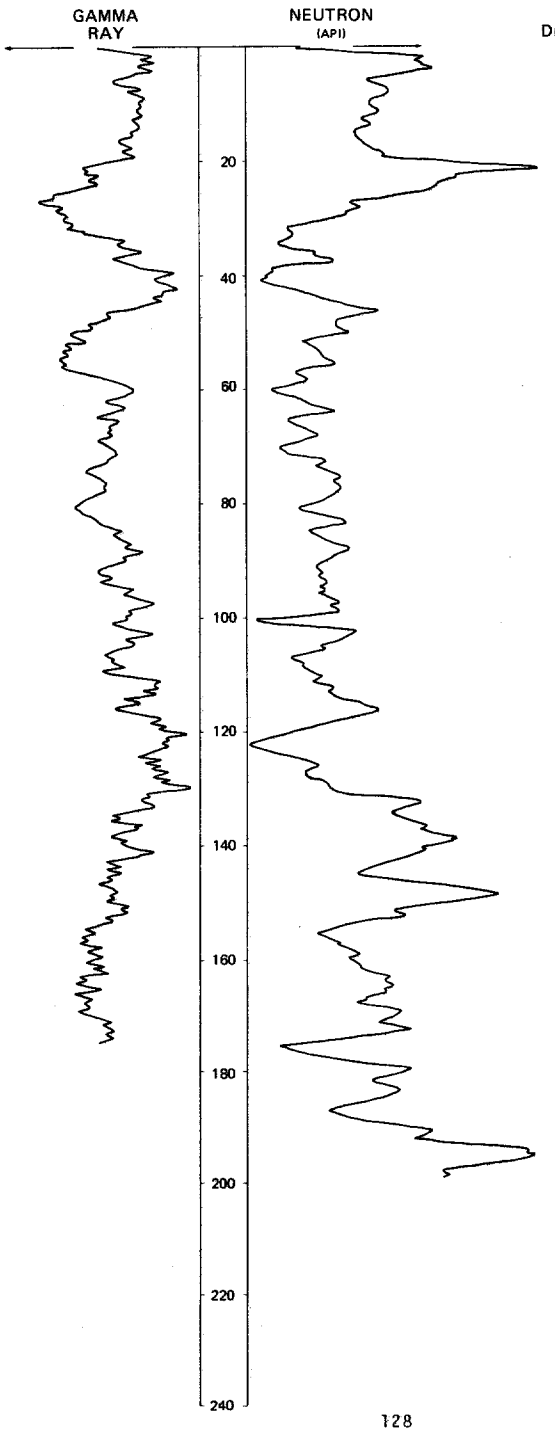
NDSWC 5001, Continued

LOCATION: 152-075-07BBB

DATE DRILLED: 9/29/76

ALTITUDE: 1570
(FT, NGVD)

DEPTH: 230
(FT)



DESCRIPTION OF DEPOSITS

152-075-09DDC
NDSWC 5854

Altitude: 1595 feet — Date drilled: 10/02/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, dark-brown, oxidized; roadfill	5	5
	Sand, very fine to medium, silty to slightly clayey, subangular to rounded, oxidized	25	30
	Sand, very fine to very coarse, subangular to rounded; gravelly from 65 to 70 feet	40	70
	Gravel, fine to coarse, sandy, angular to well-rounded	24	94
	Clay, olive-gray, very silty to sandy	3	97
	Gravel, fine to coarse, sandy, angular to rounded	5	102
	Clay, medium-dark-gray, very silty; interbedded with thin lenses of fine sand	21	123
Hell Creek Formation:			
	Shale, medium-bluish-gray, moderately sandy, fissile	17	140

152-075-20AAA
NDSWC 5855

Altitude: 1570 feet — Date drilled: 10/12/70

Glacial drift:			
	Topsoil, brownish-black, silty to sandy	1	1
	Till, yellowish-brown, silty to sandy, oxidized	12	13
	Till, olive-gray, silty; some cobbles	61	74
	Clay, medium-dark-gray, very silty to sandy	26	100
	Sand, very fine to fine, subangular to rounded	3	103
	Till, olive-gray, silty to sandy	55	158
	Sand, very fine to coarse, clayey; abundant detrital lignite	7	165
	Till, medium-dark-gray, silty to very sandy	3	168
	Sand, very fine to very coarse, slightly clayey, subangular to rounded	19	187
	Gravel, fine to coarse, sandy, subangular to well-rounded	12	199
Hell Creek Formation:			
	Shale, medium-bluish-gray, silty to slightly sandy, moderately indurated	21	220

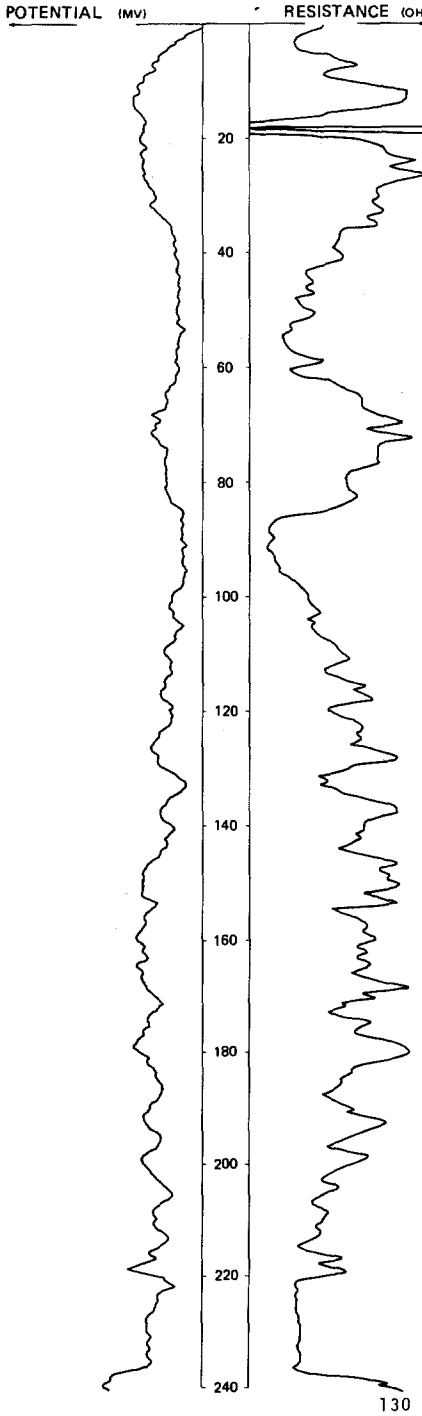
NDSWC 5853

LOCATION: 152-075-20CCC

DATE DRILLED: 10/02/70

ALTITUDE: (FT, NGVD) 1595

DEPTH: (FT) 300



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

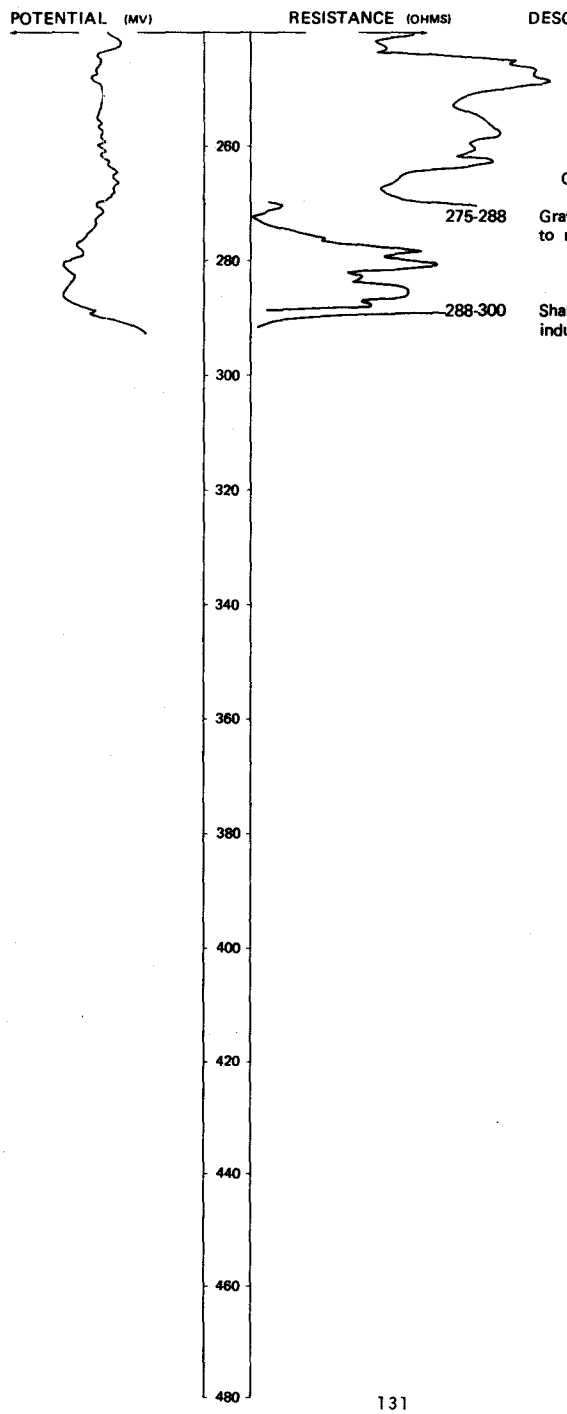
0-1	Topsoil, brownish-black, sandy.
1-9	Till, dusky-yellow, very silty to sandy, oxidized.
9-35	Sand, fine to very coarse, gravelly, subangular to rounded; some detrital lignite.
35-65	Till, medium-dark-gray, silty to slightly sandy.
65-86	Sand, fine to very coarse, gravelly, slightly clayey, subangular to rounded.
86-116	Clay, olive-gray, very silty, slightly sandy.
116-136	Clay, olive-gray, very silty; interbedded with thin lenses of fine to medium sand.
136-139	Sand, very fine to medium, silty to clayey.
139-182	Clay, medium-dark-gray, very silty; interbedded with lenses of fine to medium sand.
182-238	Till, medium-dark-gray, silty to very sandy.
238-275	Gravel, fine to coarse, sandy, angular to rounded; some clay lenses.

LOCATION: 152-075-20CCC

DATE DRILLED: 10/02/70

ALTITUDE: (FT, NGVD) 1595

DEPTH: (FT) 300



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

275-288 Gravel, fine to very coarse, angular to rounded; cobbles and boulders.

FOX HILLS SANDSTONE

288-300 Shale, medium-bluish-gray, sandy, indurated.

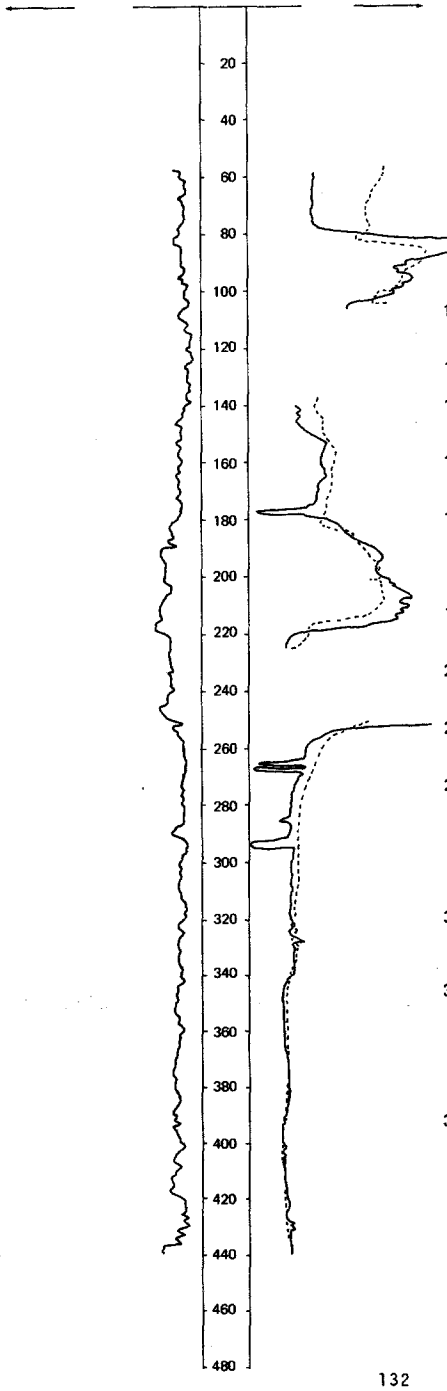
NDSWC 4971, 4971A

LOCATION: 152-075-36BBB1, 2

DATE DRILLED: 8/24/76

ALTITUDE: 1580 (FT, NGVD)

DEPTH: 440 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-10	Till, yellowish-brown.
10-13	Sand, fine to very coarse, sub-angular to subrounded, oxidized.
13-80	Till, olive-gray, silty to very sandy; some boulders.
80-105	Gravel, fine to coarse; about 40 percent fine to very coarse sand; angular to subrounded.
105-115	Sand, fine to very coarse, sub-angular to subrounded.
115-124	Silt, medium-dark-gray, very clayey.
124-128	Sand, fine to medium, silty, sub-rounded.
128-160	Till, medium-dark-gray, silty to sandy.
160-178	Clay, olive-gray, silty to very sandy; detrital lignite.

FOX HILLS SANDSTONE

178-218	Sandstone, medium-dark-gray, very fine to fine, partially indurated.
218-245	Shale, dark-gray, very sandy, slightly carbonaceous.
245-253	Sandstone, greenish-gray, fine to medium, cemented.
253-322	Shale, greenish-gray to olive-gray, carbonaceous; interbedded with lenses of siltstone and sandstone.
322-342	Sandstone, grayish-green, fine to medium; interbedded with carbonaceous shale and bentonitic siltstone.
342-396	Shale, gray; becoming very sticky; transition zone.

PIERRE SHALE

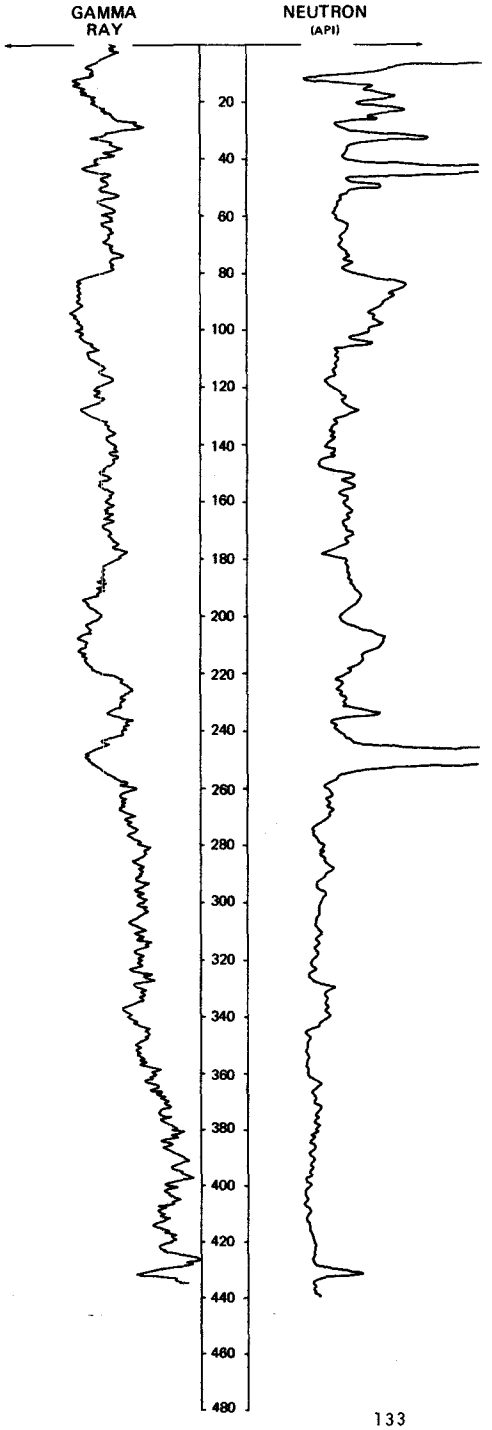
396-440	Shale, grayish-black, siliceous, fissile.

LOCATION: 152-075-36BBB1, 2

DATE DRILLED: 8/24/76

ALTITUDE: 1580
(FT, NGVD)

DEPTH: 440
(FT)



DESCRIPTION OF DEPOSITS

152-076-05CAC
(Log modified from Stemen Drilling Co.)

Altitude: 1595 feet — Date drilled: 10/26/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	3	3
	Brown clay	24	27
	Gray clay	47	74
	Gravel and clay	1	75
Hell Creek Formation:			
	Black clay	27	102
	Sandy clay	3	105
	Gray clay	69	174
	Brown coal	2	176
	Gray clay	26	202
	Gray sandy clay	7	209
	Gray clay	16	225
	Gray hard clay	8	233
	Gray sand	2	235

152-076-07BC
Missile Site A-2
(Log modified from J. N. Pitcher Drilling Co.)

Altitude: 1564 feet — Date drilled: 5/19/61

	Sand, fine to coarse, brown, oxidized; some silt and gravel	8	8
	Till, gray, silty to sandy	10	18
	Silt, gray, sandy	5	23
	Till, dark-gray, silty	2	25
	Sand, medium to coarse, and fine silty gravel	5	30
	Till, dark-gray, gravelly	8	38
Hell Creek Formation:			
	Shale, gray, silty	5	43
	Sandstone and siltstone, dark-gray	11	54
	Shale, dark-gray, silty	13	67
	Sandstone, dark-gray, silty	4	71
	Shale, dark-grayish-brown, silty to sandy	13	84
	Shale, dark-grayish-brown	10	94
	Shale, dark-grayish-brown, silty	6	100

152-076-11CCC
Test hole 1067
(Log modified from Adolphson, 1961)

Altitude: 1587 feet — Date drilled: 9/17/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, sandy, brown	3	3
	Till, sandy, yellow	2	5
	Till, yellow, and fine to medium gravel	10	15
	Till, gray, and fine to medium gravel	3	18
	Sand, medium to coarse, and fine gravel	2	20
	Till, gray, and fine to medium gravel	3	23
	Gravel, fine, and coarse sand	9	32
	Till, gray, and fine to medium gravel	23	55
	Gravel, fine	2	57
	Till, gray, and fine to medium gravel	14	71
	Sand, fine to medium	21	92
	Till, gray, and fine to medium gravel	9	101
Hell Creek Formation:			
	Clay, sandy, silty, gray	15	116
	Sand, medium, hard, silty, gray	26	142
	Clay, smooth, gray	8	150

152-076-14CCC
Test hole 1066
(Log modified from Adolphson, 1961)

Altitude: 1557 feet — Date drilled: 9/17/55

Alluvium:			
	Clay, sandy, gray	4	4
Glacial drift:			
	Sand, fine to medium	4	8
	Clay, yellow, and fine to medium gravel	9	17
	Sand, fine to coarse, and fine gravel	9	26
	Till, gray, and fine gravel	23	49
Hell Creek Formation:			
	Sand, fine to medium, silty, gray-green	13	62
	Shale, lignitic	2	64
	Clay, smooth, brown	9	73
	Clay, smooth, light-gray	2	75
	Shale, lignitic	2	77
	Clay, smooth, brown	2	79
	Clay, smooth, light-gray	1	80

152-076-18CBB
NDSWC 10191

Altitude: 1562 feet — Date drilled: 8/10/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty to very sandy, oxidized	5	6
	Sand, very fine to very coarse, gravelly, oxidized	4	10
	Clay, gray, silty to sandy	3	13
	Sand, very fine to very coarse, gravelly, subrounded to rounded	5	18
	Clay, gray, silty to sandy	2	20
	Sand, fine to very coarse, gravelly, subangular to rounded	17	37
	Clay, dark-grayish-brown, silty to sandy	5	42
Hell Creek Formation:			
	Shale, brownish-black, carbonaceous; interbedded with clayey siltstone	18	60

152-076-24BDB
(Log modified from Driver Well Drilling, Inc.)

Date drilled: 3/29/73

Glacial drift:			
	Topsoil	2	2
	Mixed gravel and clay	25	27
	Gravel	3	30
	Gray clay	3	33
	Rock; granite	1	34
	Coarse sand	11	45
	Hardpan	15	60
	Sandy clay	5	65
	Hardpan	15	80
	Gravel	5	85

152-076-26BBB
Test hole 1065
(Log modified from Adolphson, 1961)

Altitude: 1588 feet — Date drilled: 9/16/55

Glacial drift:			
	Sand, fine, silty	3	3
	Clay, smooth, light-gray	2	5
	Till, yellow, and fine to medium gravel	2	7
	Sand, medium to coarse, and fine gravel	1	8
	Till, yellow, and fine to medium gravel	4	12
	Till, gray, and fine to medium gravel	9	21
	Till, sandy, dark-brown	7	28
Hell Creek Formation:			
	Clay, smooth, light-gray	3	31
	Clay, sandy, silty, gray	3	34
	Clay, smooth, brown	6	40
	Clay, smooth, gray	10	50

152-076-35BBB
Test hole 1064
(Log modified from Adolphson, 1961)

Altitude:	1613 feet	Date drilled:	9/16/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, sandy, yellow	3	3
	Sand, fine to coarse, and fine gravel	1	4
	Till, yellow, and fine to medium gravel	8	12
	Till, gray, and fine to medium gravel	65	77
	Clay, smooth, gray	3	80
	Till, gray, and fine to medium gravel	94	174
Hell Creek Formation:			
	Clay, sandy, smooth, gray	16	190

152-076-35CCB
Missile Site A-3
(Log from E. J. Longyear Drilling Co.)

Altitude:	1617 feet	Date drilled:	4/21/61
	Till, brown, silty to sandy, oxidized	10	10
	Sand, fine, brown, clayey, oxidized	7	17
	Sand, fine, brown, silty, oxidized	9	26
	Sand, fine, gray, silty	8	34
	Clay, grayish-black, silty to sandy	15	49
	Silt and sand, fine, grayish-black, clayey	6	55
	Sand, fine, bluish-gray, silty	5	60
	Sand, fine to coarse, bluish-gray, gravelly	8	68
	Sand, fine, bluish-gray, clayey; thin lenses of gravel	12	80
	Till, dark-gray, silty	5	85
Hell Creek Formation:			
	Sandstone, grayish-green, silty; with thin interbedded lenses of shale	6	91
	Shale, light-gray, silty	10	101

152-077-05CC
(Log from Russell Drilling Co.)

		Date drilled:	8/19/74
	Topsoil	1	1
	Yellow till	18	19
	Fine sand	46	65
	Shale	195	260
	Sand and shale	20	280
	Shale	40	320
	Sand	25	345
	Shale	17	362

152-077-05DDD
NDSWC 10192

Altitude: 1597 feet — Date drilled: 8/10/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellowish-brown, silty to sandy, oxidized	10	10
	Till, light-olive-brown, very silty to sandy, oxidized	13	23
	Gravel, coarse to very coarse, sandy; cobbles and boulders	4	27
Cannonball Member:			
	Shale, dark-brownish-black, silty, carbonaceous; interbedded with thin lenses of very fine to fine clayey indurated sandstone	13	40

152-077-07CA
(Log modified from Russell Drilling Co.)

Altitude: 1560 feet — Date drilled: 3/14/74

Glacial drift:			
	Topsoil	1	1
	Yellow clay (till)	17	18
	Fine sand	4	22
	Yellow clay	18	40
	Sand and some gravel	10	50
	Shale	5	55
	Gray fine sand	50	105

152-077-19CCA
Missile Site A-1
(Log modified from J. N. Pitcher Drilling Co.)

Altitude: 1584 feet — Date drilled: 4/19/61

	Till, brown, silty, oxidized	20	20
	Sand, fine, brown, silty and clayey, oxidized	4	24
Cannonball Member:			
	Sandstone, gray-brown to dark-gray, silty	21	45
	Siltstone, dark-gray, clayey and sandy	10	55
	Shale, gray-black; interbedded with siltstone	30	85
	Sandstone, dark-gray, silty	11	96
	Sandstone, dark-gray, indurated	3	99
	Sandstone, gray, silty	2	101

152-077-25DCC
NDSWC 10190

Altitude: 1550 feet — Date drilled: 8/10/78

Glacial drift:			
	Clay, yellowish-brown, silty to sandy, oxidized	3	3
	Gravel, fine to medium; about 40 percent coarse to very coarse sand; subrounded to rounded	31	34
	Clay, dark-grayish-brown, silty	5	39
Hell Creek Formation:			
	Shale, dark-brownish-black, silty; with interbedded thin lenses of very fine clayey sandstone	21	60

152-077-26BCC
NDSWC 10189

Altitude: 1571 feet — Date drilled: 8/10/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, yellowish-brown, silty to sandy, oxidized	11	11
Cannonball Member:			
	Sandstone, greenish-gray, fine, poorly indurated	5	16
	Shale, brownish-gray, silty, fissile	4	20

152-077-28CAC
(Log from Russell Drilling Co.)

Date drilled: 7/09/76

Sand and till	26	26
Sandy shale	37	63
Brown sandy shale	59	122
Silty shale	30	152
Bedrock sand	11	163
Shale	19	182
Black shale	28	210
White sticky sand	68	278
Brown shale	12	290
Sand	31	321
Shale	21	342

152-077-28CD
(Log from Russell Drilling Co.)

Date drilled: 9/26/64

Silty sand	20	20
Surface water; gravel	3	23
Blue clay	202	225
Brown oily shale	8	233
Gray clay; streaked with sand	22	255
Sand; streaked with clay	15	270
Blue clay	10	280
Water sand	10	290

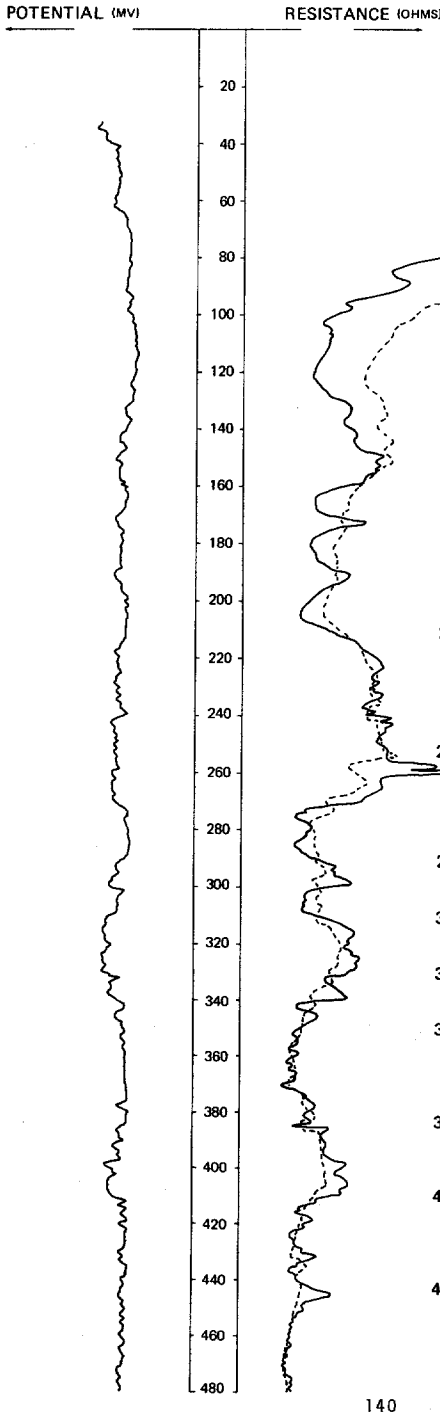
NDSWC 4973, 4973A, 4973B

LOCATION: 152-077-30DDA1, 2, 3

DATE DRILLED: 8/30/76

ALTITUDE: 1610 (FT, NGVD)

DEPTH: 620 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Topsoil, brownish-black, sandy.

1-16 Sand, fine to very coarse, gravelly, subangular to rounded, oxidized.

16-26 Till, yellowish-brown, silty to gravelly, oxidized.

CANNONBALL MEMBER

26-70 Shale, medium-dark-gray, carbonaceous, micaceous; interbedded with thin lenses of siltstone.

70-92 Sandstone, dark-gray, very fine to fine, silty.

HELL CREEK FORMATION

92-108 Shale, dark-brownish-gray, carbonaceous.

108-216 Shale, medium-dark-gray, bentonitic; interbedded with thin lenses of siltstone and sandstone.

216-268 Sandstone, medium-gray, very fine, very silty.

268-290 Shale, grayish-brown, carbonaceous; interbedded with greenish-gray very fine silty sandstone.

FOX HILLS SANDSTONE

290-300 Sandstone, grayish-green, fine to medium.

300-310 Shale, grayish-brown, very silty to sandy.

310-340 Sandstone, grayish-green, fine to medium, partially indurated.

340-376 Shale, dark-brown, carbonaceous; interbedded with greenish-gray slightly indurated siltstone and sandstone.

376-410 Sandstone, grayish-green, very fine to fine; interbedded with carbonaceous shale.

410-446 Shale, greenish-gray, very sandy, fissile.

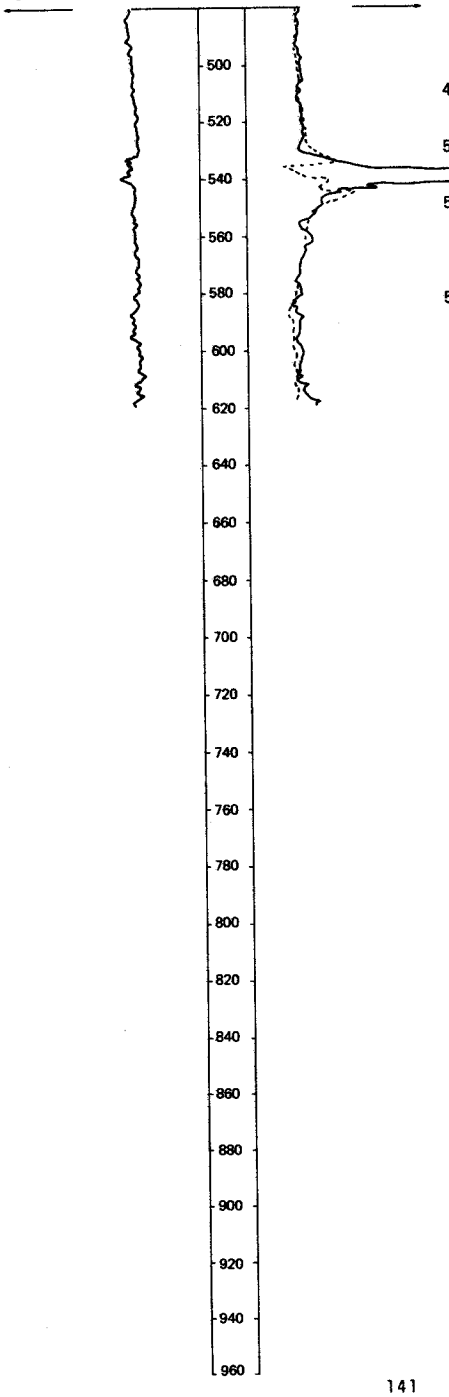
446-490 Shale, medium-gray, fissile.

LOCATION: 152-077-30DDA1, 2, 3

DATE DRILLED: 8/30/76

ALTITUDE: 1610
(FT, NGVD)

DEPTH: 620
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

490-534	Siltstone, greenish-gray, bentonitic, slightly indurated.
534-544	Sandstone, grayish-green, fine to medium, clayey, indurated.
544-578	Shale, dark-gray, very bentonitic, sticky.

PIERRE SHALE

578-620	Shale, grayish-black, siliceous, fissile; thin bentonitic lenses.

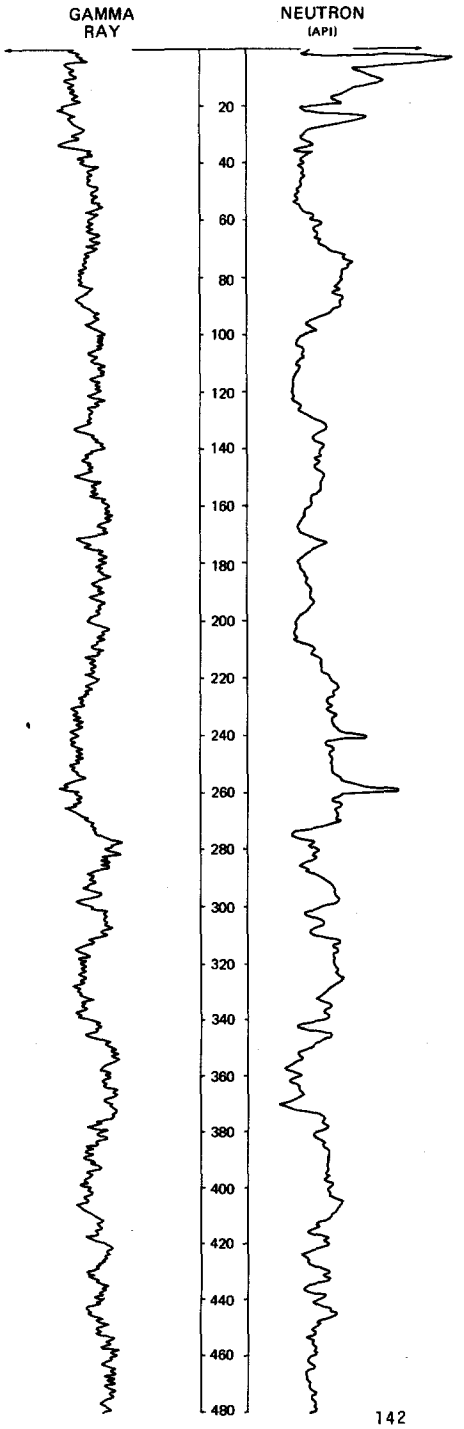
NDSWC 4973, 4973A, 4973B, Continued

LOCATION: 152-077-30DDA1, 2, 3

DATE DRILLED: 8/30/76

ALTITUDE: 1610
(FT, NGVD)

DEPTH: 620
(FT)



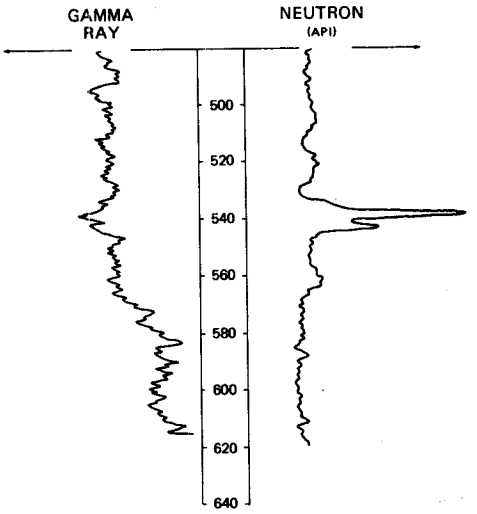
DESCRIPTION OF DEPOSITS

LOCATION: 152-077-30DDA1, 2, 3

DATE DRILLED: 8/30/76

ALTITUDE: 1610 (FT, NGVD)

DEPTH: 620 (FT)



DESCRIPTION OF DEPOSITS

152-078-05DDA
Missile Site A-9
(Log modified from J. N. Pitcher Drilling Co.)

Altitude: 1592 feet

Date drilled: 5/20/61

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Till, brown, silty to sandy, oxidized	8	8
	Sand, fine to medium, brown, oxidized	18	26
	Sand, fine, and dark-gray clayey silt	14	40
	Till, gray-brown, silty	5	45
Cannonball Member:			
	Shale, dark-grayish-brown, silty	9	54
	Sandstone and siltstone, gray-brown, clayey	4	58
	Shale, dark-gray to black, silty to sandy	22	80
	Shale, dark-grayish-brown, silty	4	84
	Sandstone, fine, gray, silty	5	89
	Shale, gray, silty	5	94
	Sandstone, fine, gray, silty	3	97
	Sandstone, fine, gray, indurated	2	99
	Sandstone, fine, gray, silty	3	102

152-078-06ACA
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1574 feet	Date drilled:	12/17/69
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, dark-brown, silty, sandy	3	3
	Sand, brown, fine, silty; trace of clay	10	13
	Sand, gray, fine to coarse; scattered fine gravel	5	18
	Till, light-gray to dark-gray, sandy, silty; scattered fine gravel and lignite fragments; sand lens from 28.5 to 29.5 feet	17	35

152-078-06DDA
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1581 feet	Date drilled:	12/16/69
Glacial drift:			
	Topsoil, sandy, silty	3	3
	Sand, light-olive-gray to dark-yellowish-brown, fine to medium; silt and clay content increases to approximately 20 percent from 21 to 25 feet	27	30
	Till, olive-gray, sandy, silty; scattered gravel and lignite fragments throughout	5	35

152-078-08BAC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1571 feet	Date drilled:	12/12/69
Glacial drift:			
	Topsoil, dark-brown, silty, sandy	3	3
	Sand, brown, fine, clayey	1.5	4.5
	Sand; brown to 15 feet; gray below; fine with some medium and coarse below 30 feet; occasional gravel to 30 feet; fine gravel below 30 feet; till finger from 36 to 37 feet	35.5	40

152-078-08BBA
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1592 feet	Date drilled:	12/16/69
Glacial drift:			
	Topsoil, silty, sandy	2	2
	Till, silty, sandy; dark yellowish brown from 2 to 13 feet; olive gray from 13 to 40 feet; carbonate concretions to 5 feet; gravelly from 30 to 31 feet; sandy and gravelly from 35 to 37 feet; scattered gravel and lignite fragments throughout	38	40
	Sand, olive-gray, fine, silty	5	45

152-078-08CAC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1567 feet	Date drilled:	1/13/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift.			
	Topsoil, black; becoming dark brown from 3 to 4 feet	4	4
	Sand, brown, fine, silty, clayey zones to 6 feet and at 7 feet	5	9
	Sand, brown, saturated; becoming gray at 19 feet, coarse gravel; coarse to fine sand with zones of fine to medium grains; lignite fragments from 23 to 24 feet	17	26
	Sand, gray, fine, uniform, saturated	8	34
	Sand, gray, clean, saturated; predominantly fine to medium grains with zones of fine gravel throughout	11	45
	Sand, gray, saturated; fine with some medium to coarse sand from 70 to 75 feet, fine gravel throughout; with higher gravel content from 70 to 75 feet; trace of silt in zones	30	75

152-078-08CDB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1565 feet	Date drilled:	12/11/69
Glacial drift:			
	Topsoil and colluvium, tan to light-gray, clayey, soft	1	1
	Sand, fine to coarse, gravelly; brown to 6 feet; gray below	49	50

152-078-16CBA
NDSWC 10079

Altitude:	1560 feet	Date drilled:	11/16/77
Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized	7	8
	Sand, fine to medium, subangular to subrounded	37	45
	Clay, brownish-gray, very silty; interbedded with lenses of fine to medium sand	9	54
	Till, medium-dark-brown, silty to sandy	6	60
Cannonball Member:			
	Shale, brownish-gray, silty, carbonaceous	20	80

152-078-17ACD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1615 feet	Date drilled:	3/04/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellowish-brown, oxidized	3	3
	Sand, brown, coarse to fine, silty, and fine gravel	1	4
	Till, yellowish-brown, gravel and sand lenses	23	27
	Sand, yellowish-brown, coarse to fine, silty; gravelly	7	34
	Sand, yellowish-brown, coarse to fine, silty; 15 percent nonplastic fines; approximately 5 percent coarse to fine gravel	2	36
	Sand, gray, fine, silty	1	37
	Till, gray, sandy to gravelly	2	39
	Sand, gray, coarse to fine, gravelly	7	46
	Till, gray, sandy to gravelly	4	50

152-078-17BAB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1566 feet	Date drilled:	1/22/70
Glacial drift:			
	Topsoil, black, sandy	1.5	1.5
	Sand, dark-brown to gray, fine, uniform, silty	5.5	7
	Sand, gray; fine with occasional medium to coarse grains; fine gravel; trace of silt	2	9
	Sand, gray, fine; lignite fragments from 20 to 22.5 feet	13.5	22.5
	Sand, light-gray, fine; clean to trace of silt in zones; occasional fine gravel and lignite particles; higher lignite content from 36.5 to 39 and 43 to 46 feet	23.5	46
	Sand, light-gray to brown, fine to medium, clean; with zones of fairly well graded sand; estimate 20 percent fine subrounded gravel in lenses; higher gravel content from 60 to 61 feet	19	65

152-078-17BAD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1568 feet	Date drilled:	1/16/70
Glacial drift:			
	Topsoil, black, silty	1.5	1.5
	Sand, brown, fine to medium, oxidized; occasional fine gravel	17.5	19
	Silt, gray, sandy	15	34
	Sand, gray, very fine; sandstone boulder from 37 to 39 feet	10	44
Cannonball Member:			
	Sandstone, gray, fine, dense, uncemented, semipervious	2	46
	Shale, gray, dense, well-consolidated, nonindurated; occasional silt lens	4	50

152-078-17DAD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1603 feet	Date drilled:	12/19/69
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, dark-brown, sandy, silty	1	1
	Sand, brown, fine, silty; with trace of clay	13	14
	Sand, brown; till inclusions or fingers; scattered fine gravel and lignite fragments	6	20
	Till, gray, sandy, silty; few scattered fine gravel and lignite fragments	15	35
Cannonball Member:			
	Shale, compact, uncemented; dark gray with reddish-gray zone from 42 to 45 feet; few sandy and silty laminations	15	50

152-078-19BCC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1603 feet	Date drilled:	7/15/55
Glacial drift:			
	Topsoil	0.5	0.5
	Till, tan and buff, silty, sandy; fine gravel and lignite fragments; silty sand zones up to 1 inch thick throughout; oxidized to 15.3 feet	14.5	15
	Till, gray, silty, sandy; some gravel and lignite fragments; gravelly zone at 19 feet; slightly oxidized to 16 feet	5	20
	Sand, gray, silty, fairly well graded; occasional clayey lens	2.5	22.5
	Till, gray, silty, sandy; some gravel and lignite fragments, sandy zones throughout	7.5	30

152-078-19CDD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1606 feet	Date drilled:	7/15/55
Glacial drift:			
	Topsoil	0.7	0.7
	Clay, buff, silty, slightly plastic	.8	1.5
	Till, tan and buff, silty, sandy; becoming gray and buff at 13 feet; some gravel and lignite fragments; oxidized to 13 feet	18	19.5
	Sand and gravel, tan, coarse, silty, clayey	2.3	21.8
	Till, gray, silty, sandy, stiff; with gravel and lignite fragments throughout; gravelly zone from 23.5 to 24 feet	8.2	30

152-078-21ACC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1614 feet	Date drilled:	12/18/69
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, dark-yellowish-brown, sandy, silty; scattered gravel and lignite fragments; carbonate concretions to 5 feet and oxidized zones throughout	21	21
	Sand, dark-yellowish-brown, fine, silty; with trace of gravel at top	11	32
	Sand, fine to medium; yellowish brown to 40 feet; dark greenish gray from 40 to 42 feet; coarse gravels with cobbles from 35 to 37 feet	10	42
	Sand, semipervious; mottled light bluish gray to medium bluish gray; predominantly medium to fine sand with trace of coarse and fine gravel	3	45
Cannonball Member:			
	Sandstone, medium-light-gray, fine, silty, unconsolidated, firm, uncemented, semipervious	5	50

152-078-21CCB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1608 feet	Date drilled:	12/18/69
Glacial drift:			
	Topsoil, dark-brown, sandy, silty	0.5	0.5
	Till, brown, silty, oxidized; leached to 2 feet; excess sand with sand lenses	14.5	15
	Till, brown, sandy, silty, oxidized; scattered fine gravel and lignite fragments	11	26
	Sand, gray; predominantly fine sand with clean fine to medium sand zones; gravel zone from 34 to 35 feet; few till fingers	12.5	38.5
Cannonball Member:			
	Shale, gray, compact, uncemented; sandy and silty with sand and silt laminations	11.5	50

152-078-21DDB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1610 feet	Date drilled:	12/17/69
Glacial drift:			
	Topsoil, dark-brown, sandy to silty	2	2
	Till, brown, sandy, silty, oxidized; leached to 5 feet; scattered fine gravel and lignite particles	18	20
	Sand, brown, very fine, clayey to silty	2	22
	Till, gray, sandy, silty; scattered fine gravel and lignite fragments	4	26
Cannonball Member:			
	Shale, dark gray with light-gray zones; clayey sandstone in zones; silty and sandy laminations	24	50

152-078-26BBB
NDSWC 10194

Altitude:	1574	Date drilled:	8/10/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, fine to coarse; about 30 percent coarse to very coarse sand; subangular to rounded	39	39
Cannonball Member:			
	Shale, dark-brown, silty, carbonaceous	5	44
	Sandstone, greenish-gray, very fine to medium, clayey; interbedded with light-gray poorly indurated siltstone	16	60

152-078-26CAD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1608 feet	Date drilled:	12/12/69
Glacial drift:			
	Topsoil, black, sandy	1	1
	Till, yellowish-brown, oxidized	5	6
Cannonball Member:			
	Shale, yellowish-brown and brown, oxidized	4	10
	Shale, unconsolidated, uncemented; mottled brown and light gray; oxidized zones and siltstone laminations to 1/8 inch throughout	20	30
	Shale; mottled light gray to dark gray; unconsolidated and soft to firm from 30 to 38 feet; slightly consolidated and firm to moderately hard from 38 to 50 feet; siltstone laminations to 1/8 inch throughout	20	50

152-078-26CBB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1608 feet	Date drilled:	12/15/69
Glacial drift:			
	Topsoil, brown, sandy, dry	0.5	0.5
	Clay; mottled yellowish brown; gypsum crystals; carbonate concretions and oxidized zones throughout	4.5	5
Cannonball Member:			
	Siltstone, yellowish-brown, oxidized; weathered shale zones from 8 to 10 and 12 to 13 feet	11	16
	Shale, unconsolidated; mottled brown, yellowish brown, and light gray	6.5	22.5
	Shale, unconsolidated to slightly consolidated, firm to tough; mottled black and light gray; light-gray zones are siltstone laminations up to 1/8 inch thick; soft siltstone zone from 45 to 47 feet	27.5	50

152-078-27ACC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1588 feet — Date drilled: 12/16/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, medium-gray to dark-gray, soft	2.5	2.5
	Sand, yellowish-brown, fine to medium	18.5	21
Cannonball Member:			
	Shale, unconsolidated, uncemented; mottled dark gray with light-gray silt laminations to 1/8 inch thick	29	50

152-078-27BAC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1606 feet — Date drilled: 12/16/69

Glacial drift.			
	Sand, brown, silty	3.5	3.5
	Sand, brown to yellowish-brown, fine; dry to 9.7 feet	6.5	10
Cannonball Member:			
	Siltstone, oxidized; mottled yellowish brown, brown, and gray	5	15
	Shale, unconsolidated, uncemented; mottled dark-gray clay with light-gray silt laminations to 1/8 inch thick	35	50

152-078-27DAD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1626 feet — Date drilled: 2/26/70

Glacial drift:			
	Topsoil, black, sandy	1	1
	Sand, brown; alternating sequences of silty to clayey sand and sandy glacial till; few coarse sand grains and fine gravel	14	15
	Sand, brown, fine to coarse	8	23
	Till, brown, oxidized; excess sand in zones	8	31
	Sand, brown; with occasional medium to coarse grains and occasional lignite particles	2	33
Cannonball Member:			
	Shale, gray, sandy, unconsolidated, slightly compacted, uncemented	17	50

152-078-28CCC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1608 feet — Date drilled: 7/14/55

Glacial drift:			
	Topsoil	0.8	0.8
	Sand, brown, medium to coarse, oxidized; becoming tan at 19 feet; trace of silt in zones; few gravels throughout	20.2	21
	Sand, light-gray; approximately 25 percent gravel; fairly clean in upper portion; becoming silty with depth	7.5	28.5
	Sand, gray, medium to coarse, silty; some gravel	1.5	30

152-078-29CCB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1608 feet	Date drilled:	7/14/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	0.6	0.6
	Till, buff, silty, sandy; becoming buff and gray at 13 feet; gravel and lignite fragments throughout; oxidized to 13 feet; slightly oxidized from 13 to 20 feet	19.4	20
	Till, gray, silty; fine to medium gravel and lignite fragments throughout; slightly oxidized to 22 feet	10	30

152-078-33AAA
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1610 feet	Date drilled:	7/13/55
Glacial drift:			
	Topsoil	2	2
	Till, tan, silty, sandy; fine gravel throughout	13	15
	Till, tan, silty, sandy; becoming gray at 20 feet; fine gravel throughout; occasional lignite fragments, oxidized to 20 feet	15	30

152-078-33CCC
NDSWC 10080

Altitude:	1615 feet	Date drilled:	11/16/77
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, gravelly, oxidized	32	33
	Sand, fine to medium, subangular	2	35
	Till, medium-dark-gray, silty	2	37
	Clay, brownish-gray, silty, shove block	9	46
	Sand, coarse; about 20 percent medium gravel; subangular to rounded; abundant detrital lignite	2	48
Cannonball Member:			
	Shale, dark-brownish-gray, silty, carbonaceous	12	60

152-078-35AAA
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1597 feet	Date drilled:	7/14/55
Glacial drift:			
	Topsoil	1	1
	Sand, brown, coarse, clayey; approximately 10 percent gravel	4.6	5.6
	Till, brown, silty, sandy; fine to coarse gravel and lignite fragments throughout	3.9	9.5
	Sand, grayish-black, coarse; some fine gravel; trace of clay; abundant lignite slack gives black color	3.5	13
	Till, silty, sandy; brownish gray to 16 feet; gray from 16 to 22.5 feet; fine to medium gravel and lignite fragments throughout; slightly oxidized to 16 feet	9.5	22.5
	Sand, gray, fine, silty	7.5	30

152-078-35AAB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1615 feet — Date drilled: 12/11/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, dark-brown, silty	1	1
	Till, brown, silty, oxidized; sand layers from 5 to 7 and 11 to 13 feet; occasional fine gravel and lignite fragments	15.5	16.5
Cannonball Member:			
	Shale, brown, sandy, oxidized; few gypsum crystals	3.5	20
	Shale, gray; spotty oxidation to 21 feet; sandy zones	30	50

152-078-36BCB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1635 feet — Date drilled: 12/11/69

Glacial drift:			
	Topsoil, brown, silty	1	1
	Till, yellowish-brown, sandy, silty; gravelly with carbonate concretions to 5 feet; gravel content decreases and fines increase below 5 feet	6	7
	Silt, yellowish-brown, sandy	3	10
	Till, yellowish-brown, sandy, silty; scattered gravel and lignite fragments; shale fragments; carbonate concretions	15	25
	Gravel and cobbles	3	28
Cannonball Member:			
	Siltstone, yellowish-brown, sandy, unconsolidated, uncemented	2	30
	Shale, unconsolidated; mottled light brown and dark brown; siltstone zone from 30 to 35 feet; gypsum crystals scattered throughout	10	40
	Shale, unconsolidated; mottled brown and black	8	48
	Claystone, unconsolidated, uncemented; mottled light gray to dark gray; laminated with light-gray siltstone layers to 1/8 inch thick; alternating with dark-gray claystone	7	55

152-078-36CAA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1606 feet — Date drilled: 12/10/69

Glacial drift:			
	Topsoil, dark-brown, sandy, silty	2	2
	Till, brown, sandy, silty, oxidized; occasional gravel and lignite fragments	5	7
	Sand, brown, fine, slightly clayey, oxidized	1	8
Cannonball Member:			
	Shale, brown, sandy, compact, oxidized	2	10
	Shale, gray, sandy, compact; spotty oxidation to 18 feet	35	45
	Sandstone, gray, fine, slightly clayey, uncemented	5	50

152-078-36DDB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1611 feet — Date drilled: 12/10/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, dark-brown	1.5	1.5
	Till, brown, sandy, silty, oxidized; scattered gravel and lignite fragments	7.5	9
	Clay, brown to grayish-brown; sandy laminations; scattered gypsum crystals	6.5	15.5
	Clay, brown, oxidized; 40 percent very fine sand	2.5	18
Cannonball Member:			
	Shale, gray, sandy, compact; with thin sand layers; oxidized top foot	32	50

152-079-02AAA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1566 feet — Date drilled: 7/20/55

Glacial drift:			
	Topsoil	0.5	0.5
	Sand, brown, coarse; approximately 25 percent gravel	1	1.5
	Till, gray, silty, sandy; fine gravel throughout; slightly oxidized to 6.5 feet	17	18.5
	Sand, gray, medium and coarse, silty; some fine to coarse gravel	1	19.5
Cannonball Member:			
	Shale, dark-gray, silty; lenses of very fine silty sand	20.5	40

152-079-02CDD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1576 feet — Date drilled: 7/19/55

Glacial drift:			
	Sand, dark-gray, fine to medium	2.4	2.4
	Sand, brown, coarse, silty; trace of clay; approximately 15 percent gravel	8.4	10.8
Cannonball Member:			
	Shale, gray, silty, sandy, lenses and streaks of dark-gray silty organic clay; indistinct bedding	3	13.8
	Shale, gray, very hard; silty organic clay; lenses of silty very fine sand throughout	26.2	40

152-079-03DDD
NDSWC 10077

Altitude: 1575 feet — Date drilled: 11/15/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, brownish-gray, silty, oxidized; detrital lignite	7	8
	Sand, fine to medium, subrounded	19	27
Cannonball Member:			
	Shale, brown, carbonaceous	15	42
	Sandstone, greenish-gray, very fine to medium, indurated	2	44
	Shale, medium-dark-gray, silty to sandy	3	47

152-079-05BCB
NDSWC 10073

Altitude: 1585 feet — Date drilled: 11/15/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, fine to medium, subangular, oxidized	21	22
	Till, medium-gray, silty to sandy	12	34
	Sand, medium, subrounded	1	35
	Till, dark-gray, sandy	2	37
	Sand, fine, subangular	1	38
	Till, dark-gray, silty to sandy	5	43
Cannonball Member:			
	Shale, grayish-brown, slightly fissile; carbonaceous streaks	17	60

152-079-05CBB
NDSWC 10074

Altitude: 1578 feet — Date drilled: 11/15/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, fine, subrounded, oxidized	15	16
	Till, dark-gray, pebbly; cobbles and boulders at 24 to 25 feet	10	26
Cannonball Member:			
	Sandstone, greenish-gray, fine; interbedded with lenses of siltstone and shale	14	40

152-079-08BCC
NDSWC 10075

Altitude: 1588 feet — Date drilled: 11/15/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, brownish-black, silty	1	1
	Clay, yellowish-brown, oxidized	3	4
	Sand, fine to coarse, oxidized	6	10
	Sand, medium to very coarse, subrounded to rounded; interbedded with lenses of fine gravel	23	33
	Gravel, fine to coarse, sandy, subrounded	12	45
	Clay, dark-gray, silty	3	48
Cannonball Member:			
	Shale, grayish-black; some carbonaceous streaks	13	61
	Sandstone, grayish-green, fine to medium; clayey in places	9	70

152-079-11BCC
NDSWC 10076

Altitude: 1590 feet — Date drilled: 11/15/77

	Topsoil, brownish-black, sandy	1	1
	Sand, fine, silty, oxidized	4	5
	Clay, yellowish-brown, silty, oxidized	6	11
	Sand, gray, fine, silty	14	25
	Till, brownish-gray, pebbly	3	28
Cannonball Member:			
	Shale, dark-brownish-gray, carbonaceous; interbedded with thin lenses of greenish-gray fine clayey sandstone	12	40

152-079-11BCD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1576 feet — Date drilled: 7/19/55

Glacial drift:			
	Topsoil	1.5	1.5
	Till, buff, silty, sandy; fine gravel	1.5	3
	Sand, tan, silty, fairly well graded; with some fine gravel	3.1	6.1
	Till, brown, silty, sandy; becoming gray at 10 feet; fine gravel throughout	13.9	20
	Cobbles or boulders	2	22
	Sand, gray, micaceous, fine, silty; dark-gray silty streaks throughout	3	25
	Till, gray, silty; lenses of silty sand; fine and medium gravel throughout	4	29
	Clay, gray; with silty sand lenses	1	30

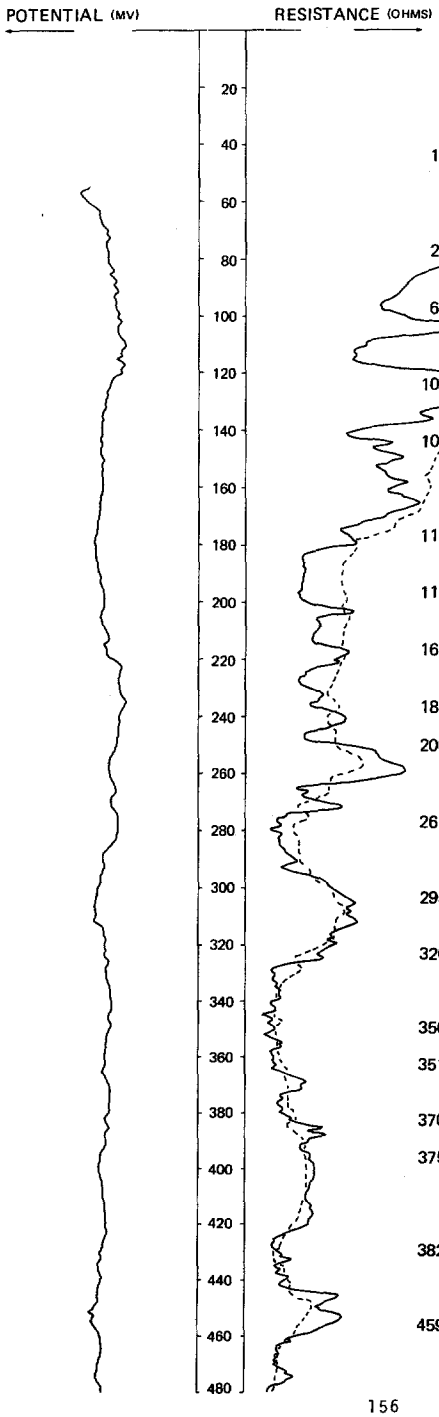
NDSWC 4974, 4974A, 4974B

LOCATION: 152-079-13DDD1, 2, 3

DATE DRILLED: 9/01/76

ALTITUDE: (FT, NGVD) 1605

DEPTH: (FT) 640



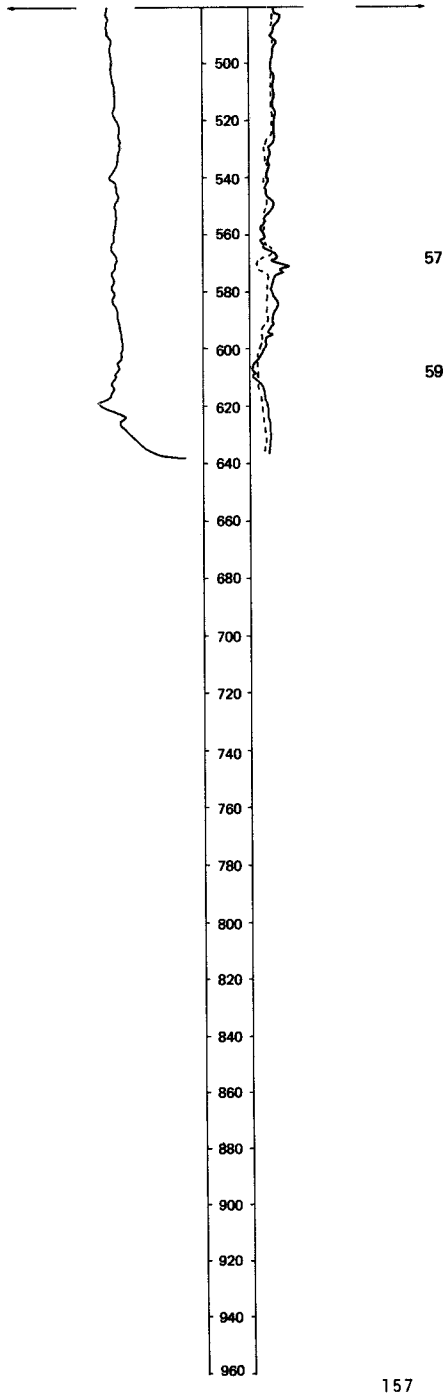
	DESCRIPTION OF DEPOSITS
0-1	Topsoil, brownish-black.
1-13	Silt, yellowish-brown, clayey, very sandy, oxidized.
13-26	Till, dark-gray to olive-gray, silty to sandy.
	CANNONBALL MEMBER
26-66	Sandstone, dark-greenish-gray, fine to medium, clayey; indurated at 64 feet.
66-100	Shale, dark-gray, slightly bentonitic; interbedded with siltstone; some carbonaceous lenses.
100-105	Sandstone, greenish-gray, fine; carbonaceous streaks.
105-118	Shale, light-greenish-gray, slightly carbonaceous, fissile.
	HELL CREEK FORMATION
118-119	Sandstone, greenish-gray, fine, indurated.
119-168	Sandstone, greenish-gray, very fine to fine, partially indurated.
168-182	Siltstone, light-gray, bentonitic; carbonaceous streaks.
182-200	Shale, brownish-gray, silty, bentonitic.
200-261	Sandstone, light-gray, very fine to fine, very clayey; interbedded with thin lenses of siltstone.
261-295	Shale, dark-brownish-gray, silty; interbedded with bentonitic siltstone; carbonaceous streaks.
295-326	Sandstone, greenish-gray, very fine to fine.
326-350	Shale, dark-gray, very silty; some carbonaceous streaks.
350-351	Lignite.
351-370	Shale, grayish-brown, silty, carbonaceous.
370-375	Sandstone, greenish-gray, very fine.
375-382	Shale, grayish-brown, silty, carbonaceous, fissile.
	FOX HILLS SANDSTONE
382-459	Sandstone, grayish-green, very fine to fine, glauconitic; interbedded with thin lenses of siltstone.
459-572	Shale, medium-dark-gray, silty, bentonitic.

LOCATION: 152-079-13DDD1, 2, 3

DATE DRILLED: 9/01/76

ALTITUDE: 1605
(FT, NGVD)

DEPTH: 640
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE,
Continued

572-594 Shale, dark-gray to grayish-black, bentonitic, sticky, macerated; transition zone.

PIERRE SHALE

594-640 Shale, grayish-black, siliceous, fissile; thin lenses of bentonite.

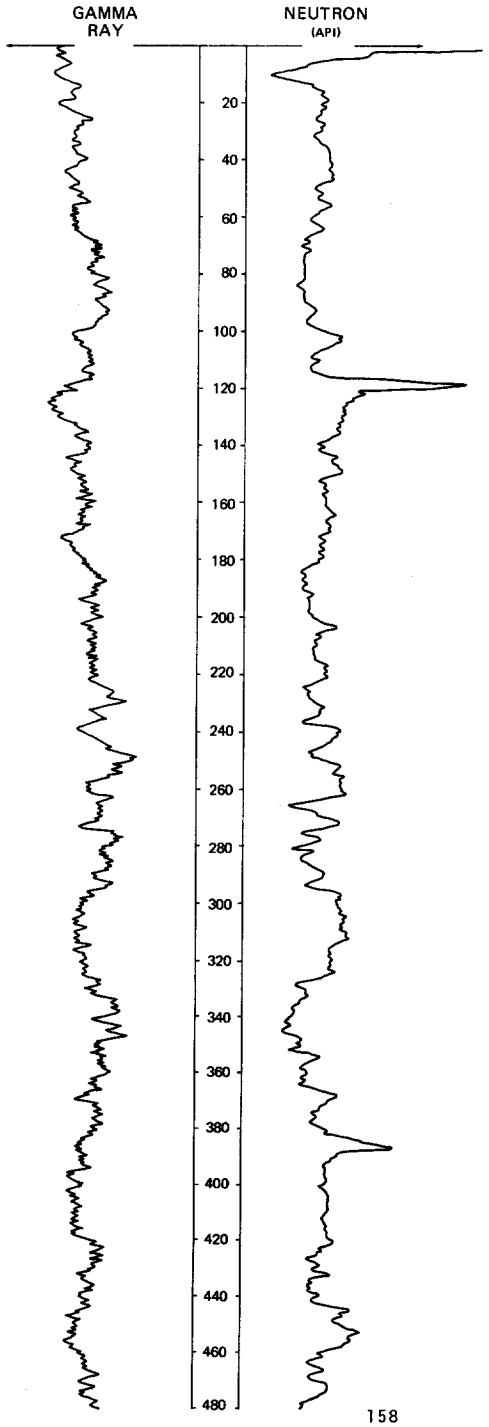
NDSWC 4974, 4974A, 4974B, Continued

LOCATION: 152-079-13DDD1, 2, 3

DATE DRILLED: 9/01/76

ALTITUDE: 1605
(FT, NGVD)

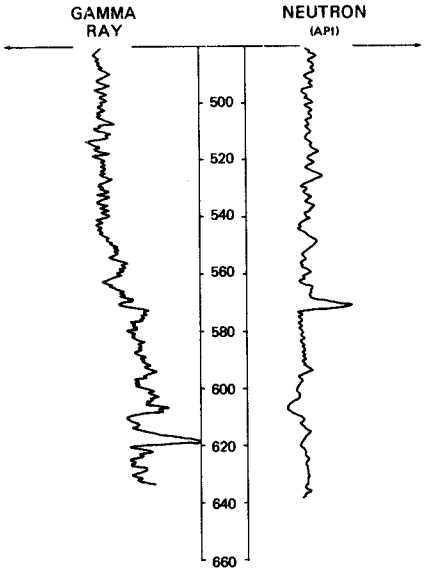
DEPTH: 640
(FT)



DESCRIPTION OF DEPOSITS

LOCATION: 152-079-13DDD1, 2, 3 DATE DRILLED: 9/01/76

ALTITUDE: 1605 (FT, NGVD) DEPTH: 640 (FT)



DESCRIPTION OF DEPOSITS

152-079-14ABB
(Log modified from U.S. Bureau of Reclamation)

Altitude. 1613 feet Date drilled: 7/18/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, brown to tan, fine; silty in zones; zones of medium and coarse; few gravels throughout; thin lignite slack laminae at 24 feet	32	32
	Sand, buff, fine, silty; silt content increases with depth	3	35

152-079-14DAD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1601 feet Date drilled: 7/18/55

Glacial drift:			
	Topsoil	0.5	0.5
	Sand, brown; some gravel throughout; clayey near bottom	8	8.5
	Till, buff, silty, sandy; becoming gray at 9.2 feet; fine gravel and lignite fragments; oxidized to 9.2 feet	3.7	12.2
	Sand and gravel, gray, silty, clayey; medium and coarse sand; approximately 20 percent gravel	2	14.2
	Till, gray, silty, sandy, gravelly, hard	3.8	18
Cannonball Member:			
	Sand, gray, micaceous, fine, silty, compact	12	30

152-079-18BBB
Missile Site B-4
(Log modified from J. N. Pitcher Drilling Co.)

Altitude:	1577 feet	Date drilled:	4/18/61
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Till, gray-brown, silty	25	25
	Till, dark-gray, silty	19	44
	Sand, fine to medium, silty, gravelly	8	52
	Silt, dark-gray, sandy, clayey	3	55
	Sand, fine, and silt; with lenses of gravel	3	58
	Silt, dark-gray, sandy, clayey	8	66
Cannonball Member:			
	Shale, dark-gray, very silty	13	79
	Sandstone, fine, and gray very dense siltstone	21	100

152-079-21DDD
NDSWC 10200

Altitude:	1617 feet	Date drilled:	8/14/78
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, very sandy and gravelly, oxidized	13	14
	Gravel, fine; about 40 percent fine to very coarse sand; angular to subrounded; oxidized	12	26
	Till, dark-gray, very silty to sandy	26	52
	Gravel, fine; about 30 percent coarse to very coarse sand, subangular to rounded	8	60
	Till, dark-gray, silty to very sandy	21	81
	Clay, dark-gray, silty to sandy	7	88
	Till, dark-gray, very sandy to gravelly	14	102
	Till, dark-gray, sandy	12	114
Cannonball Member:			
	Shale, brownish-gray, sandy, slightly carbonaceous	12	126
	Sandstone, greenish-gray, very fine to fine, clayey	14	140

152-079-29AAA
NDSWC 10206

Altitude:	1612 feet	Date drilled:	8/15/78
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, very silty to sandy, oxidized	11	12
	Sand, very fine to very coarse; about 30 percent very fine to coarse gravel; subrounded to rounded	7	19
	Till, medium-gray, sandy	8	27
	Sand, fine to coarse, subangular	1	28
	Till, dark-gray, sandy	8	36
	Sand, fine to coarse, subangular	3	39
	Till, dark-gray, sandy	5	44
	Silt, dark-gray, clayey, sandy	16	60
	Sand, very fine to medium, silty, subrounded to rounded	13	73
	Clay, dark-gray, silty, sandy	3	76
Cannonball Member:			
	Siltstone, dark-gray, sandy, slightly indurated	3	79
	Shale, dark-gray, silty, fissile	21	100

152-079-32AAA
NDSWC 10201

Altitude: 1633 feet — Date drilled: 8/15/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized	5	6
	Till, dark-brown, silty to very sandy, oxidized	11	17
	Sand, fine to coarse, gravelly, oxidized	3	20
	Till, dark-gray, sandy to gravelly	25	45
	Clay, dark-grayish-brown, silty to very sandy	3	48
Cannonball Member:			
	Sandstone, dark-gray, very fine to medium, well-indurated	2	50
	Sandstone, greenish-gray, very fine, poorly indurated; some carbonaceous streaks	30	80

152-079-33BCC
NDSWC 10205

Altitude: 1642 feet — Date drilled: 8/15/78

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty to sandy, oxidized	4	5
	Gravel, fine to medium; about 20 percent coarse to very coarse sand; subrounded to rounded; oxidized	7	12
	Till, olive-brown, silty to sandy, oxidized	3	15
	Till, dark-gray, sandy to gravelly	27	42
Cannonball Member:			
	Shale, dark-gray, silty, fissile	18	60

152-079-35DDD
NDSWC 10199

Altitude: 1604 feet — Date drilled: 8/14/78

	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty to sandy, oxidized	7	8
	Till, dark-gray, silty to very sandy	30	38
	Gravel, fine to medium; about 40 percent fine to very coarse sand; subangular to rounded	6	44
	Gravel, fine to coarse, sandy; interbedded with lenses of silty clay	23	67
	Gravel, fine to medium; about 10 percent coarse sand; subrounded to rounded	11	78
	Till, dark-gray, silty to very sandy	23	101
	Cobbles and boulders	3	104
	Till, dark-gray, sandy	2	106
Cannonball Member:			
	Sandstone, dark-gray, very fine to fine, well-indurated	2	108
	Sandstone, light-gray, very fine to fine, poorly indurated; some carbonaceous streaks	11	119
	Shale, dark-brown, carbonaceous, indurated	21	140

152-080-05DAA
(Log from Leo Erck Well Drilling)

Altitude:	1685 feet	Date drilled:	7/18/72
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black dirt	2	2
	Yellow clay	13	15
	Gray clay	75	90
	Sandy clay; coal	12	102
	Gray clay	98	200
	Blue sand	15	215

152-080-05DDA
(Log modified from North Dakota Geological Survey)

Altitude.	1667 feet	Date drilled:	7/22/70
	Till, tan, silty; few stones	4	4
	Till, dark-gray, silty	5	9
	Till, brown to gray; rusty oxidized stains	5	14
	Till, gray to brown	5	19
	Till, brown to gray	5	24
	Till, olive-gray, wet	10	34
	Till, gray	20	54

152-080-09CCC
NDSWC 10210

Altitude:	1652 feet	Date drilled:	8/15/78
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, very silty to sandy, oxidized	5	6
	Clay, yellowish-brown, silty, oxidized	10	16
	Clay, dark-gray, silty	5	21
	Sand, very fine to very coarse, gravelly, subrounded to rounded	23	44
	Till, dark-gray, sandy to gravelly	8	52
	Sandstone, brownish-gray, very fine to medium, silty, moderately indurated	20	72
	Gravel, fine; about 40 percent coarse to very coarse sand	4	76
Tongue River Member:			
	Shale, grayish-brown, fissile; interbedded with thin lenses of very fine clayey sandstone	44	120

152-080-12CCC
NDSWC 10209

Altitude: 1600 feet — Date drilled: 8/15/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized	7	8
	Clay, dark-brownish-gray, silty; abundant fossil fragments	40	48
	Till, dark-gray, sandy to gravelly	12	60
Cannonball Member:			
	Shale, dark-brownish-gray, slightly carbonaceous, fissile	20	80

152-080-15AAA
NDSWC 10208

Altitude: 1618 feet — Date drilled: 8/15/78

	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy to gravelly	17	18
	Till, dark-gray, very silty to sandy	13	31
	Sand, fine to coarse, subrounded to rounded	2	33
	Till, dark-gray, sandy	21	54
Cannonball Member:			
	Sandstone, brownish-gray, very fine to fine, silty; carbonaceous streaks	6	60

152-080-24CCC
NDSWC 10207

Altitude: 1650 feet — Date drilled: 8/15/78

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy, oxidized	19	20
	Sand, fine to coarse, gravelly, subrounded	2	22
	Till, dark-gray, silty to sandy	12	34
	Till, dark-gray, sandy, gravelly	7	41
Tongue River Member:			
	Sandstone, dark-gray, very fine to fine, poorly indurated; interbedded with thin lenses of silty shale	19	60

152-080-29AAD
(Log from Donald & Keith Erck Well Drilling, Inc.)

Date drilled: 4/23/73

Topsoil	1	1
Yellow clay; with some water and some sand and gravel	67	68
Blue clay; with some coarse sand and some water	47	115
Hardpan	1	116
Blue sandstone; with water	7	123

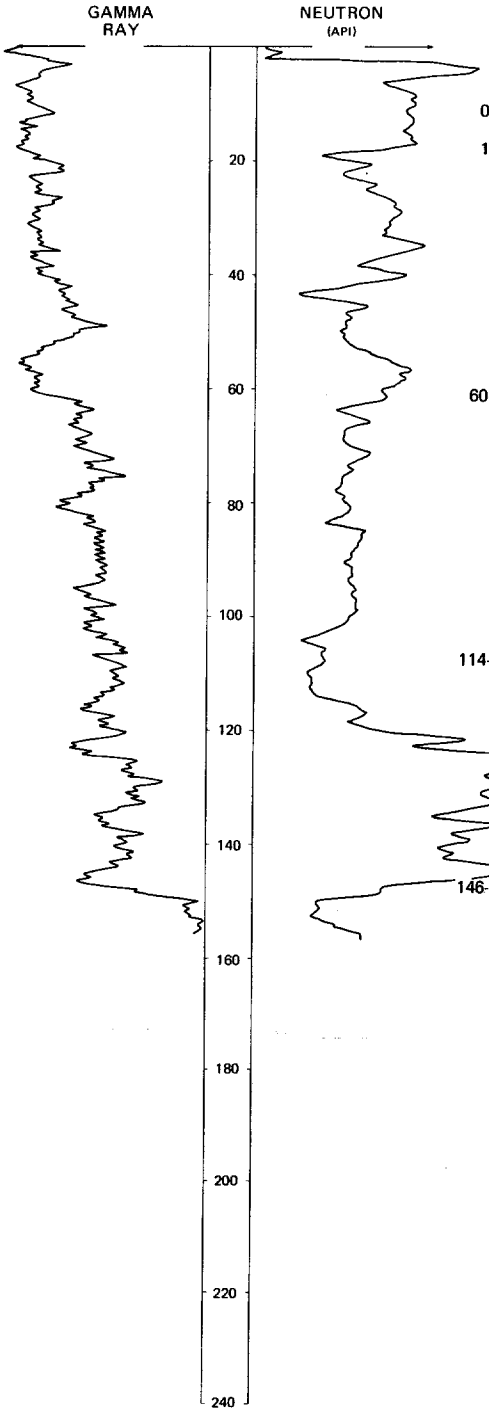
NDSWC 4996

LOCATION: 153-075-07CAC

DATE DRILLED: 9/27/76

ALTITUDE: 1525 (FT, NGVD)

DEPTH: 160 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Topsoil, brownish-black.

1-60 Sand, medium to coarse, subangular to subrounded, well-sorted.

60-114 Till, medium-gray, very silty to very sandy.

114-146 Till, medium-gray, sandy to gravelly; cobbles.

FOX HILLS SANDSTONE

146-160 Siltstone, brownish-gray to greenish-gray; interbedded with lenses of carbonaceous shale and sandstone.

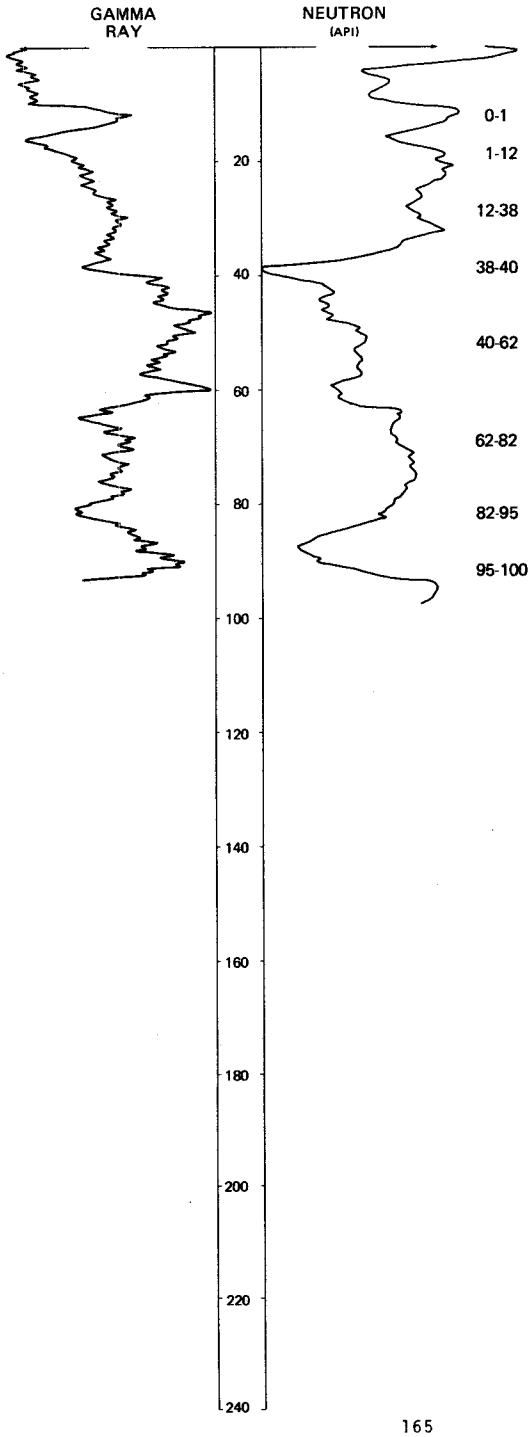
NDSWC 4995

LOCATION: 153-075-08BBB

DATE DRILLED: 9/27/76

ALTITUDE: 1530
(FT, NGVD)

DEPTH: 100
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-12	Silt, yellowish-brown, clayey, oxidized.
12-38	Till, dark-gray to olive-gray, sandy to gravelly, partially oxidized.
38-40	Lignite.

HELL CREEK FORMATION

40-62	Siltstone, brownish-gray, sandy to clayey, macerated.

FOX HILLS SANDSTONE

62-82	Siltstone, grayish-green, very sandy; carbonaceous streaks.
82-95	Shale, grayish-brown, silty, partially carbonaceous.
95-100	Sandstone, grayish-green, fine to medium, clayey.

153-075-18C
(Log modified from Russell Drilling Co.)

Date drilled: 8/11/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Silty sandy till	43	43
	Till and some gravel	171	214
	White bedrock sand	46	260
	Silty sand	18	278
	Brown shale	64	342
	Brown and gray shale	12	354
	Bedrock sand	41	395
	Brown and gray shale	7	402

153-075-31DCC
(Log modified from Russell Drilling Co.)

Date drilled: 9/04/72

Glacial drift:			
	Topsoil	1	1
	Yellow clay	24	25
	Sand	21	46

153-076-03DDD
NDSWC 9549

Altitude: 1542 feet

Date drilled: 5/12/76

Glacial drift:			
	Sand, very fine to medium, subrounded to rounded; oxidized to 10 feet	16	16
	Till, medium-dark-gray, sandy to gravelly	4	20
	Sand, fine to coarse, subangular to subrounded	10	30
	Silt, dark-gray, clayey	5	35
	Gravel, fine to coarse, bouldery, angular to subrounded	9	44
	Till, dark-gray to olive-gray; interbedded with thin lenses of sand and gravel	20	64
	Sand, fine to very coarse; about 30 percent fine to coarse gravel; angular to rounded	33	97
Hell Creek Formation:			
	Sandstone, greenish-gray, fine to medium; interbedded with carbonaceous shale	23	120

153-076-05DDD
NDSWC 5850

Altitude: 1540 feet — Date drilled: 10/01/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, very fine to fine, silty, subangular, oxidized	4	5
	Till, yellowish-brown, sandy, oxidized; cobbles	6	11
	Till, olive-gray, silty to slightly sandy	6	17
	Boulder, sandstone, indurated	2	19
	Till, dark-gray, sandy to gravelly	14	33
	Till, dark-gray, sandy	25	58
	Till, dark-gray, silty to sandy; occasional cobbles	80	138
	Clay, dark-gray, very silty	15	153
	Till, dark-gray, silty to gravelly; with thin lenses of sand	28	181
	Sand, fine to medium, silty to clayey, subangular	5	186
	Till, dark-gray, very sandy	7	193
	Sand, fine to medium, silty, subangular	4	197
	Till, dark-gray, silty to very sandy	17	214
	Sand, very fine to very coarse, silty, subangular to rounded	29	243
	Gravel, fine to coarse, sandy, angular to well-rounded	100	343
Pierre Shale:			
	Shale, grayish-black, siliceous, indurated; some thin lenses of bentonite	17	360

153-076-08DCD
NDSWC 5849

Altitude: 1555 feet — Date drilled: 9/30/70

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, very fine to medium, subangular to rounded, oxidized	4	5
	Till, yellowish-brown, sandy to gravelly, oxidized	10	15
	Till, olive-gray, sandy to gravelly; some cobbles	15	30
	Sand, very fine to fine, clayey to silty, subangular to rounded	10	40
	Till, olive-gray, silty to sandy	10	50
	Sand, very fine to fine, subangular	3	53
	Clay, dark-gray, very silty, sandy	14	67
	Sand, very fine to very coarse, subangular to rounded; abundant detrital lignite; occasional thin lenses of silty clay	133	200
	Gravel, fine to coarse, very sandy, angular to rounded; occasional thin lenses of silty clay	60	260
Fox Hills Sandstone:			
	Sandstone, greenish-gray, very fine, slightly clayey, poorly indurated	20	280

153-076-10DDC
(Log modified from Russell Drilling Co.)

Date drilled: 1/02/73

Glacial drift:			
	Topsoil	1	1
	Blue clay	17	18
	Fine sand	2	20
	Blue clay (till)	155	175
	Fine to medium-coarse sand	15	190

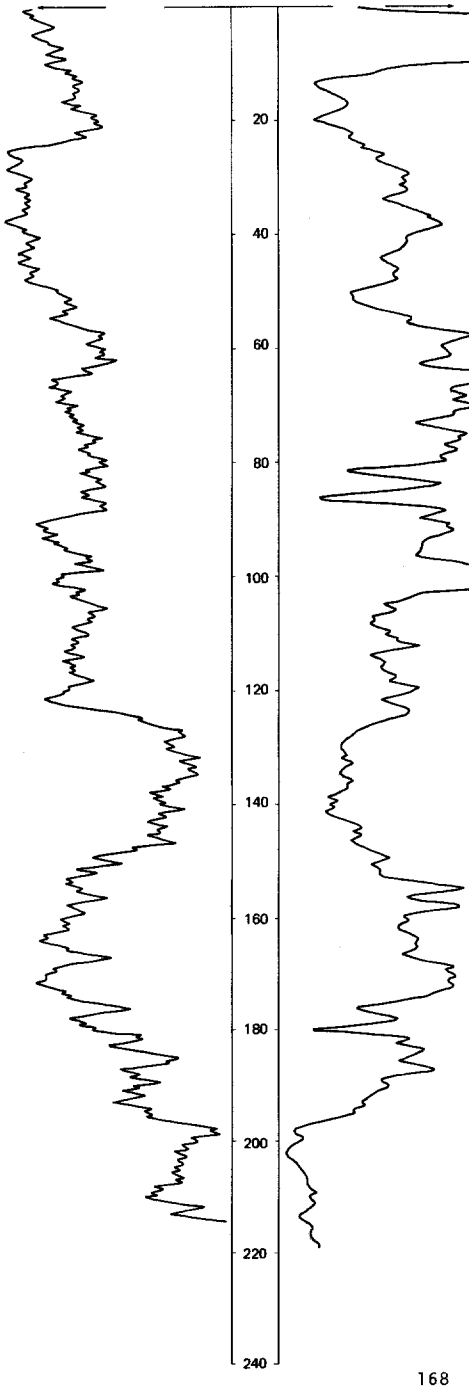
NDSWC 4997, 4997A

LOCATION: 153-076-12DDD1, 2

DATE DRILLED: 9/28/76

ALTITUDE: 1540 (FT, NGVD)

DEPTH: 220 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-10	Sand, medium to coarse, subangular to rounded; oxidized to 8 feet.
10-24	Clay, medium-gray, very silty to sandy.
24-51	Sand, medium to coarse, subangular to rounded.
51-88	Till, olive-gray, silty to sandy.
88-125	Till, medium-dark-gray, sandy to very gravelly.
125-146	Siltstone, greenish-gray, sandy; shove block.
146-150	Till, dark-gray, sandy to gravelly.
150-195	Sand, medium to very coarse; about 40 percent fine to coarse gravel; angular to subrounded.

FOX HILLS SANDSTONE

195-220	Sandstone, greenish-gray, very fine to fine, glauconitic; interbedded with lenses of medium-gray siltstone.

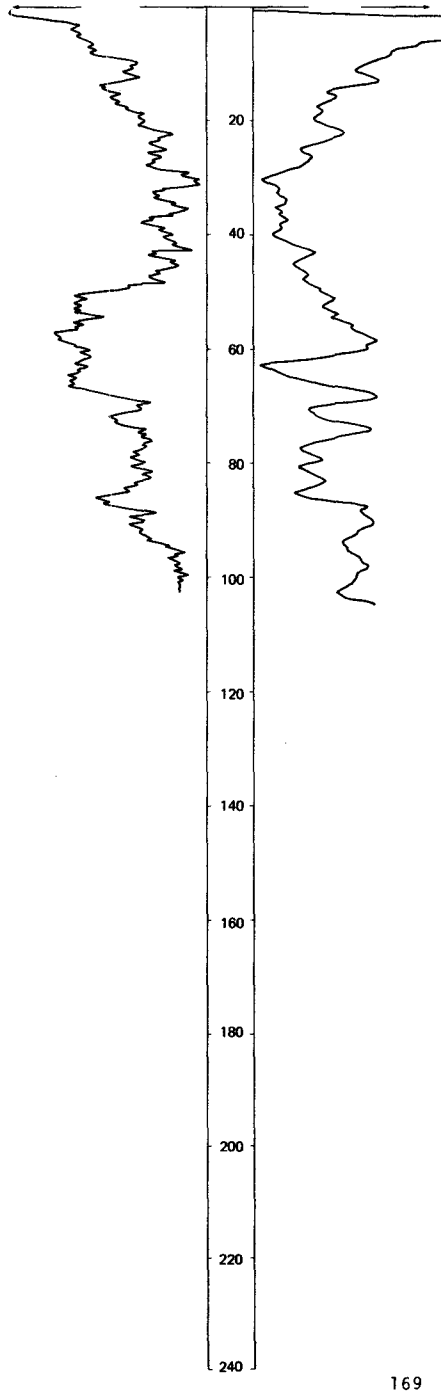
NDSWC 4998

LOCATION: 153-076-13DDD

DATE DRILLED: 9/28/76

ALTITUDE: 1560
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

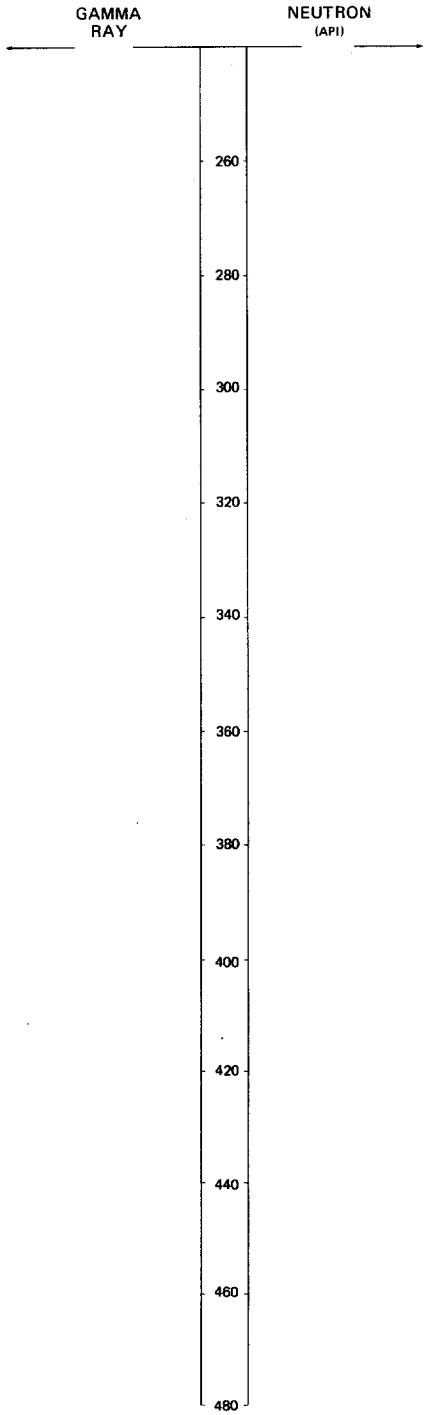
0-7	Sand, very fine to coarse, subangular to rounded, oxidized.
7-15	Till, yellowish-brown, sandy; cobbles and boulders.
15-25	Till, dark-gray, gravelly; cobbles and boulders.
25-45	Clay, dark-gray, silty to slightly sandy.
45-55	Sand, very fine to coarse, subrounded to rounded.
55-67	Gravel, fine to coarse, angular to subrounded.
67-109	Till, medium-dark-gray, sandy to gravelly.
109-135	Sand, medium to very coarse; about 40 percent fine to coarse gravel; subrounded to rounded.
135-160	Sand, medium to very coarse, gravelly, subrounded to rounded.
160-230	Till, dark-gray, silty; occasional lenses of sand and gravel to 193 feet.
230-257	Sand, very fine to very coarse, silty, gravelly, subangular to subrounded.

LOCATION: 153-076-13DDD

DATE DRILLED: 9/28/76

ALTITUDE: 1560
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

257-280 Siltstone, medium-greenish-gray, sandy, slightly indurated.

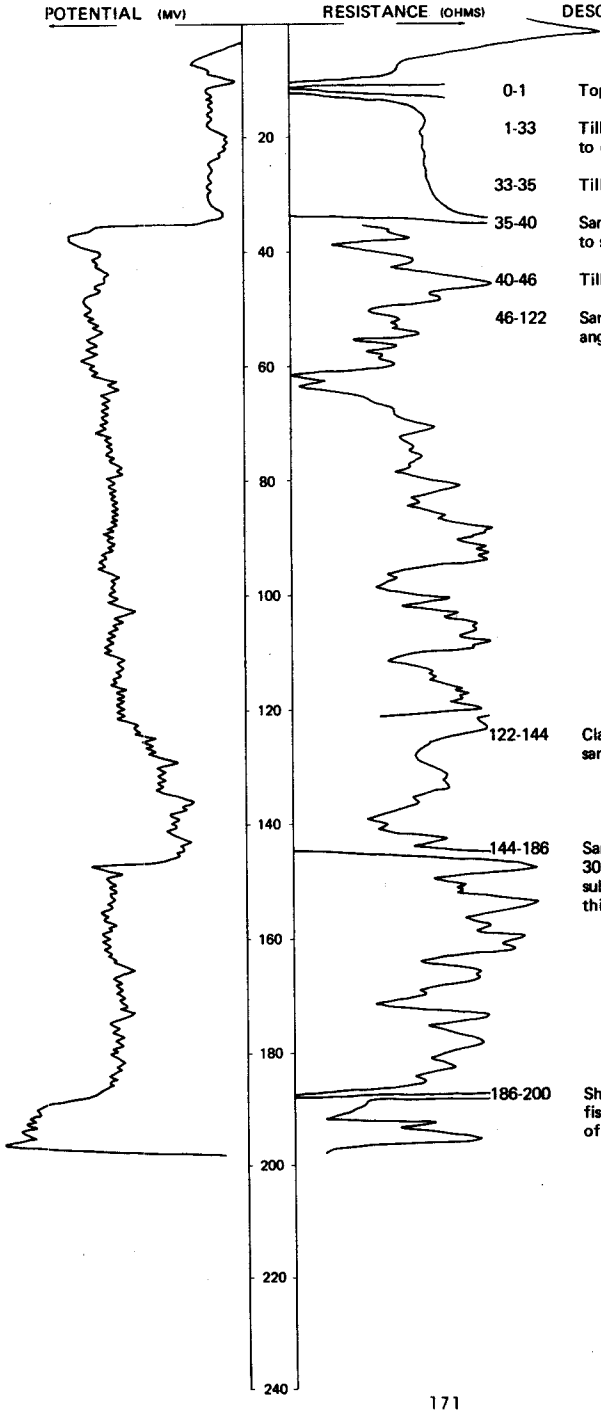
NDSWC 5852

LOCATION: 153-076-20AAA

DATE DRILLED: 10/01/70

ALTITUDE: 1570 (FT, NGVD)

DEPTH: 200 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1 Topsoil, brownish-black.

1-33 Till, yellowish-brown, silty, sandy to gravelly, oxidized; some cobbles.

33-35 Till, olive-gray, silty, pebbly.

35-40 Sand, fine to very coarse, clayey to silty.

40-46 Till, olive-gray, silty to sandy.

46-122 Sand, very fine to medium, sub-angular to rounded.

122-144 Clay, medium-dark-gray, silty to sandy.

144-186 Sand, fine to very coarse; about 30 percent fine to medium gravel; subangular to rounded; occasional thin lenses of silty clay.

HELL CREEK FORMATION

186-200 Shale, bluish-gray to greenish-gray, fissile; interbedded with thin lens of fine clayey to silty sandstone.

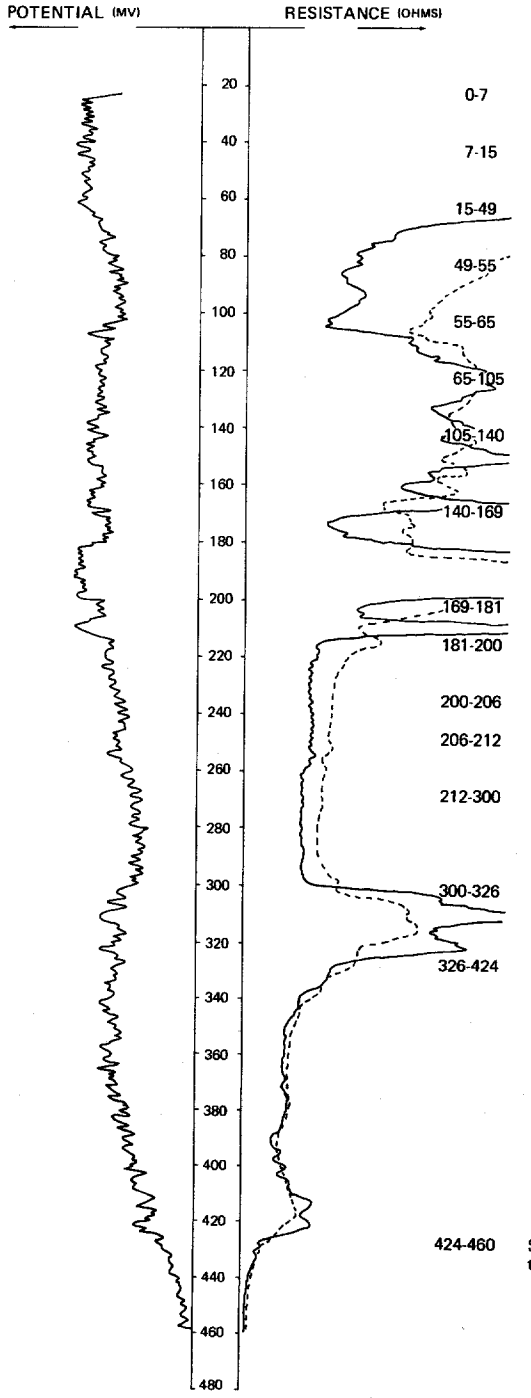
NDSWC 4999

LOCATION: 153-076-25AAA1

DATE DRILLED: 9/28/76

ALTITUDE: 1560 (FT, NGVD)

DEPTH: 460 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-7	Sand, fine to coarse, angular to subrounded, oxidized.
7-15	Till, yellowish-brown, sandy to gravelly, oxidized.
15-49	Till, dark-gray to olive-gray, sandy to gravelly.
49-55	Sand, coarse, subangular to rounded, well-sorted.
55-65	Gravel, fine to coarse, subangular to subrounded, poorly sorted.
65-105	Till, medium-dark-gray, silty to sandy.
105-140	Sand, fine to very coarse, predominantly coarse, subangular to subrounded.
140-169	Sand, fine to very coarse, predominantly coarse; about 40 percent fine to medium gravel; subangular to subrounded.
169-181	Till, olive-gray, sandy to gravelly.
181-200	Sand and gravel, fine to coarse, subrounded.
200-206	Till, dark-gray, sandy to gravelly.
206-212	Sand and gravel, fine to coarse, subrounded to rounded.
212-300	Till, olive-gray, silty to sandy.
300-326	Sand, fine to coarse; about 20 percent medium gravel; subrounded to rounded.
326-424	Till, dark-gray, silty to sandy.

PIERRE SHALE

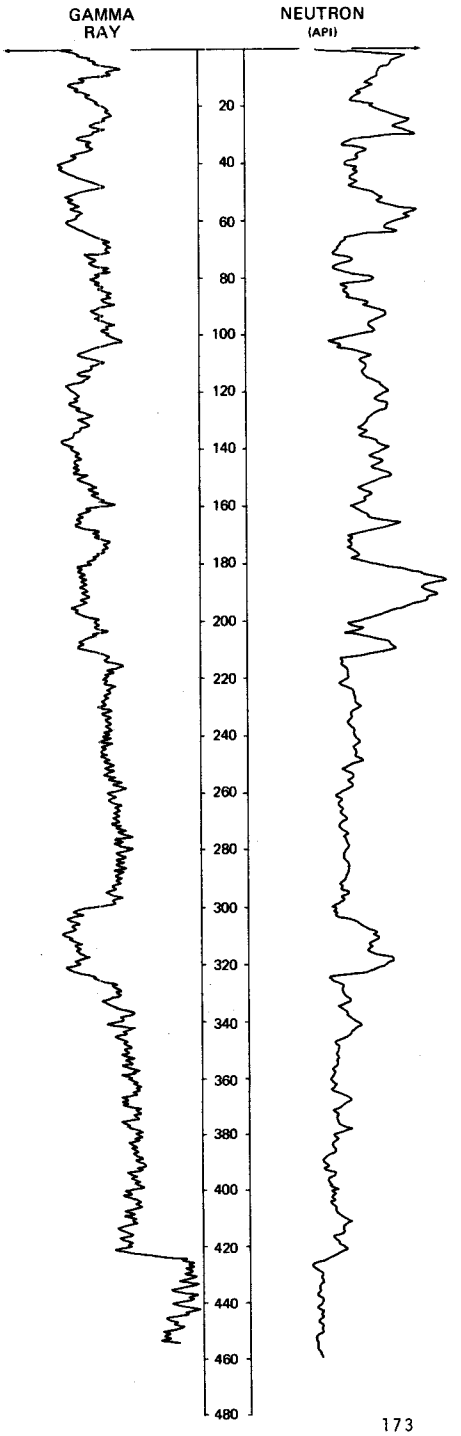
424-460	Shale, grayish-black, siliceous; some thin lenses of bentonite.

LOCATION: 153-076-25AAA1

DATE DRILLED: 9/28/76

ALTITUDE: 1560
(FT, NGVD)

DEPTH: 460
(FT)



DESCRIPTION OF DEPOSITS

153-076-25AAA2
NDSWC 4999A

Altitude: 1560 feet

Date drilled: 9/29/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, angular to subrounded, oxidized	7	7
	Till, yellowish-brown, sandy to gravelly, oxidized	8	15
	Till, olive-gray, sandy to gravelly	34	49
	Sand, coarse; about 30 percent fine to medium gravel; subangular to rounded	3	52
	Till, dark-gray, sandy to gravelly	8	60

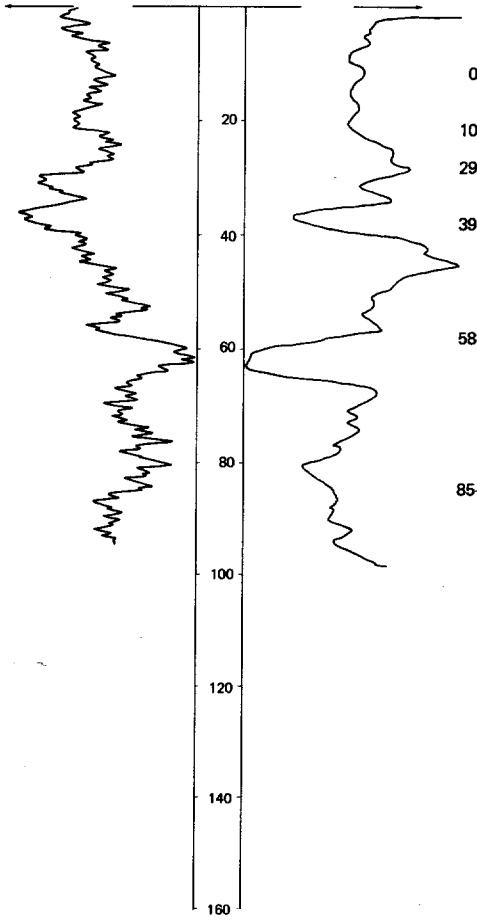
NDSWC 5000

LOCATION: 153-076-36ABA

DATE DRILLED: 9/29/76

ALTITUDE: 1570 (FT, NGVD)

DEPTH: 100 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-10 Till, yellowish-brown, silty to sandy, oxidized.

10-29 Till, dark-olive-gray, gravelly.

29-39 Gravel, fine to medium, sandy, very clayey.

39-58 Till, dark-olive-gray, sandy to gravelly.

58-85 Till, dark-gray, macerated.

HELL CREEK FORMATION

85-100 Sandstone, greenish-gray, very fine, clayey; interbedded with medium-gray siltstone.

153-077-02ADD
NDSWC 5305

Altitude:	1550 feet	Date drilled:	5/22/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Till, yellowish-brown, very sandy to gravelly, oxidized	16	17
	Till, olive-gray, sandy to gravelly	9	26
	Sand, fine to coarse, gravelly, subrounded	4	30
	Till, dark-gray, silty to very sandy	17	47
	Till, dark-gray, sandy	11	58
	Sand, fine to medium, subangular	2	60
	Till, dark-gray, silty to sandy	20	80
	Sand, fine to coarse, gravelly, subrounded; abundant detrital lignite	52	132
	Gravel, fine to medium, sandy, subrounded	20	152
	Gravel, medium to very coarse, sandy, subrounded	6	158
	Till, dark-gray, sandy to gravelly	5	163
	Cobbles and boulders	3	166
Hell Creek Formation:			
	Sandstone, light-greenish-gray, fine to medium, fissile, indurated; interbedded with carbonaceous shale	14	180

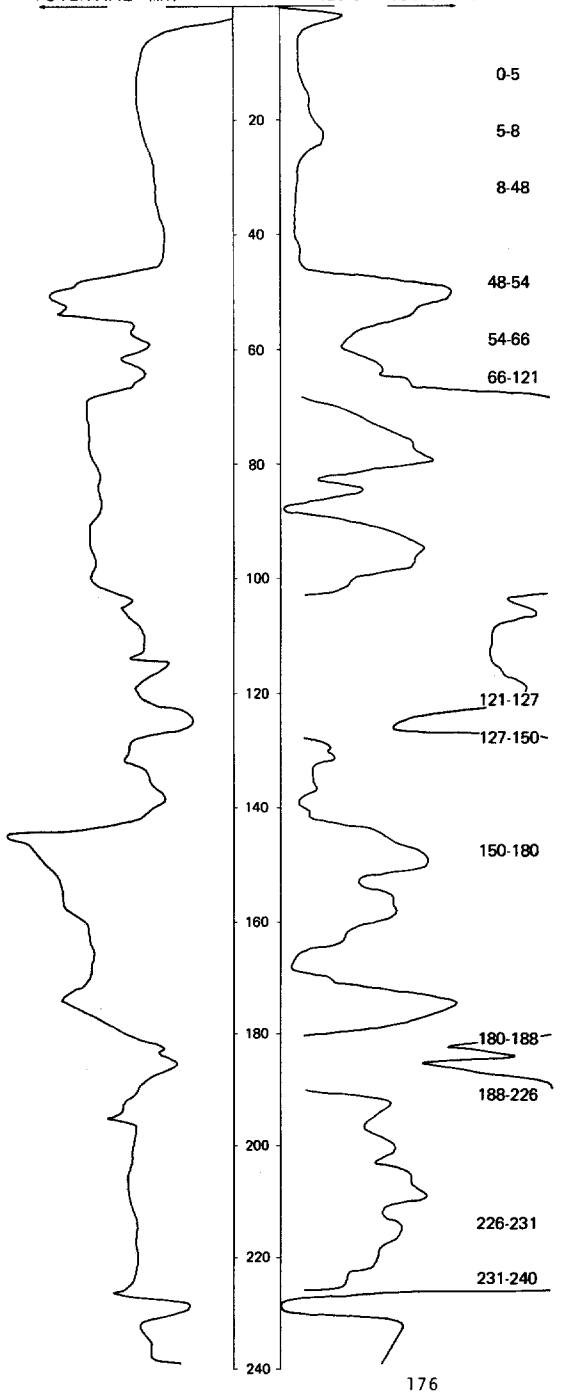
NDSWC 9396

LOCATION: 153-077-02CCC

DATE DRILLED: 8/11/75

ALTITUDE: 1540
(FT, NGVD)

DEPTH: 240
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-5	Sand, fine to very coarse, sub-angular, oxidized.
5-8	Till, yellowish-brown to dusky-brown, silty to sandy, oxidized.
8-48	Till, medium-gray to dark-gray, silty, very sandy.
48-54	Sand, fine to coarse, predominantly medium, angular to subrounded.
54-66	Clay, dark-gray, silty to very sandy.
66-121	Sand, fine to very coarse, predominantly coarse, angular to subrounded; becoming gravelly with abundant detrital lignite below 80 feet.
121-127	Clay, dark-gray, silty to sandy.
127-150~	Sand, fine to very coarse, gravelly; abundant detrital lignite.
150-180	Gravel, fine to coarse; about 30 percent medium gravel; angular to subrounded.
180-188	Silt, dark-gray, clayey, slightly sandy.
188-226	Gravel, fine to coarse; about 30 percent medium gravel; subrounded.

FOX HILLS SANDSTONE

226-231	Shale, brownish-gray, carbonaceous, fissile.
231-240	Sandstone, greenish-gray, very fine to medium, clayey, partially indurated.

153-077-03CBB
NDSWC 5307

Altitude: 1550 feet — Date drilled: 5/23/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, yellowish-green, silty to very sandy, oxidized	15	15
	Till, olive-gray, very silty, very sandy	4	19
	Gravel, medium, sandy, subangular	3	22
	Till, dark-gray, silty to sandy	9	31
	Sand, fine to coarse, silty, subrounded	2	33
	Till, dark-gray, sandy to gravelly	16	49
Hell Creek Formation:			
	Sandstone, light-green to dark-green, very fine to fine, silty to clayey, indurated	6	55
	Shale, brownish-gray, silty, partially carbonaceous, fissile	25	80

153-077-04AAA
NDSWC 9537

Altitude: 1530 feet — Date drilled: 5/06/76

Glacial drift:			
	Sand, fine to very coarse; about 20 percent fine to coarse gravel; subangular to rounded; oxidized to 15 feet	38	38
	Till, dark-gray, silty, very sandy	95	133
	Sand, very fine to coarse, predominantly medium, silty, subrounded to rounded	11	144
	Till, dark-gray, sandy to very gravelly	27	171
Hell Creek Formation:			
	Shale, brownish-gray, slightly carbonaceous, fissile; interbedded with lenses of greenish-gray very fine to fine clayey sandstone	29	200

153-077-04BCC
NDSWC 9535

Altitude: 1538 feet — Date drilled: 5/05/76

Glacial drift:			
	Sand, fine to very coarse, gravelly, angular to subrounded; oxidized to 8 feet	10	10
	Clay, brown to olive-gray, sandy	20	30
	Gravel, fine to medium, angular to subrounded	2	32
	Till, olive-gray to dark-gray, sandy to gravelly	11	43
	Gravel, fine to coarse, angular to subangular; cobbles	8	51
Hell Creek Formation:			
	Shale, grayish-brown, carbonaceous; interbedded with dark-gray sandy siltstone	29	80

153-077-05AAA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1536 feet — Date drilled: 8/21/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, brown; about 90 percent coarse to fine; 10 percent fines; few scattered lignite fragments	22.5	22.5
	Till, gray, sandy, silty; scattered gravel and lignite fragments	13.5	36
Hell Creek Formation:			
	Shale, gray, unconsolidated; sandy laminations and thin sand lenses	14	50

153-077-05DCC
NDSWC 5308

Altitude: 1540 feet — Date drilled: 5/23/78

Glacial drift:			
	Sand, fine to very coarse, gravelly, subangular to subrounded, oxidized	21	21
	Gravel, medium; about 30 percent fine to very coarse sand; subangular to subrounded	2	23
Hell Creek Formation:			
	Shale, brownish-black, very carbonaceous, poorly indurated; peaty appearance	17	40

153-077-05DDA
NDSWC 9533

Altitude: 1535 feet — Date drilled: 5/05/76

Glacial drift:			
	Sand, fine to very coarse, angular to subrounded; oxidized to 9 feet	11	11
	Till, olive-gray, silty to sandy, pebbly	13	24
Hell Creek Formation:			
	Shale, brownish-gray; occasional thin lenses of limestone; interbedded with dark-gray very fine to fine clayey sandstone	36	60

153-077-06AAA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1533 feet — Date drilled: 8/20/70

Glacial drift:			
	Topsoil, dark-brown	2	2
	Sand, brown to gray; about 85 to 90 percent coarse to predominantly medium and fine sand; 5 to 10 percent fines; 5 percent gravel in zones; trace of clay in zones; lignite slack concentrations at 13 and 28 feet; scattered fine lignite particles	36.5	38.5
	Till, gray, sandy, silty; scattered gravel and lignite fragments	6.5	45
Hell Creek Formation:			
	Sandstone, gray, fine, compact, unconsolidated, firm; with black clay shale laminations	5	50

153-077-07BDC2
(Log modified from C. A. Simpson & Son)

Date drilled: 11/24/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Brown clay	1	2
	Light-gray clay	4	6
	Yellow sand	2	8
	Gray sand	3	11
	Gray clay; with coal	3	14
	Coarse sand; some clayey	5	19
	Blue clay; with pebbles	11	30
	Coarse sand	.5	30.5
	Blue clay	2.5	33
	Medium to coarse sand	4	37
	Gray fine to medium sand	2	39
	Medium to coarse sand	3	42
	Fine to medium sand	4	46
	Fine sand to fine gravel	4	50
	Fine to medium slightly clayey sand	3	53
	Coarse sand	3	56
	Sand, gravel, and pebbles	2	58
	Clay	2	60

153-077-08DDD
NDSWC 9534

Altitude: 1540 feet

Date drilled: 5/05/76

Glacial drift:			
	Sand, fine to very coarse, gravelly, angular to subrounded, oxidized	6	6
	Till, yellowish-brown, silty to sandy, oxidized	4	10
	Till, medium-gray to olive-gray, silty to sandy	35	45
	Sand, fine to coarse, silty to clayey, angular to subrounded	11	56
	Till, dark-gray, silty to very sandy	22	78
Hell Creek Formation:			
	Shale, brownish-gray, carbonaceous; interbedded with very fine to fine partially indurated sandstone	22	100

153-077-10ACA
(Log modified from Verne R. Peterson Well Drilling)

Date drilled: 5/07/75

Glacial drift:			
	Topsoil	1.5	1.5
	Yellow stony clay	30.5	32
	Gray stony clay	59	91
	Coarse clean gravel	7	98

153-077-11CCC
NDSWC 9532

Altitude: 1550 feet — Date drilled: 5/04/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, yellowish-brown, silty to sandy, oxidized	23	23
	Till, medium-dark-gray to olive-gray, sandy	7	30
	Gravel, fine to medium; about 30 percent coarse sand; angular to subrounded	2	32
Hell Creek Formation:			
	Shale, dark-brownish-gray, sandy, carbonaceous	16	48
	Sandstone, greenish-gray, very fine to medium, clayey; carbonaceous streaks	9	57
	Sandstone, brownish-gray to greenish-gray, fine, very clayey; thin lenses of limestone	12	69
	Shale, brownish-gray, silty, sandy, fissile	11	80

153-077-15ADD
(Log modified from Nick Erck Well Drilling)

Altitude: 1565 feet — Date drilled: 9/18/73

	Black topsoil	1.5	1.5
	Yellow clay	20.5	22
	Gray clay	23	45
	Hardpan	2	47
	Gray clay	72	119
	Blue sand; shale	9	128

153-077-23BCC
NDSWC 9531

Altitude: 1560 feet — Date drilled: 5/04/76

Glacial drift:			
	Sand, fine to very coarse; about 40 percent fine to medium gravel; subangular to subrounded; oxidized to 25 feet	36	36
	Till, olive-gray, silty, very sandy; occasional thin lenses of sand and gravel	26	62
Hell Creek Formation:			
	Shale, dark-gray to brownish-gray, sandy, partially carbonaceous, fissile	18	80

153-077-29AAA
NDSWC 10193

Altitude: 1542 feet — Date drilled: 8/10/78

Glacial drift:			
	Gravel, fine to medium; about 40 percent fine to very coarse sand; subangular to rounded; oxidized to 6 feet	23	23
	Till, dark-gray, very silty and sandy	6	29
	Gravel, fine to medium; about 40 percent coarse to very coarse sand; subrounded to rounded	5	34
Hell Creek Formation:			
	Shale, dark-brownish-black, carbonaceous; interbedded with sandy siltstone	26	60

153-077-32ABA
Missile Site A-11
(Log modified from J. N. Pitcher Drilling Co.)

Altitude: 1578 feet — Date drilled: 4/18/61

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand, fine, brown, silty, oxidized	13	13
	Silt and clay, gray-brown	3	16
Cannonball Member:			
	Sandstone, fine, gray, silty, clayey	8	24
	Shale, dark-gray, silty	15	39
	Sandstone, fine, gray, silty, clayey	4	43
	Sandstone, fine, gray, silty	7	50
	Sandstone, fine, dark-gray, silty; lignitic streaks	11	61
	Siltstone, gray, sandy, clayey	3	64
	Shale, dark-gray, interbedded with light-gray siltstone	33	97
	Sandstone, fine, dark-gray, silty	3	100

153-077-34ACD
(Log from Russell Drilling Co.)

Altitude: 1580 feet — Date drilled: 7/01/67

	Gravel and sand	15	15
	Blue clay	75	90
	Hard sandstone	4	94
	Blue clay	85	179
	Soft coal	2	181
	Gray clay; with sand	11	192
	Brown clay and coal	18	210
	Brown clay	8	218
	Gray clay; with sand	42	260
	Clay	33	293
	Clay; with good water sand	32	325

153-077-34BA
(Log from Russell Drilling Co.)

Altitude: 1660 feet — Date drilled: 5/26/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Yellow till	17	18
	Yellow silty sand	12	30
	Very fine silty sand	10	40
	Shale	100	140
	Fine sand and brown shale	20	160
	Shale	80	240
	Brown shale and sand	40	280
	Shale	20	300
	Sand	24	324

153-077-35BBB
NDSWC 9530

Altitude: 1545 feet — Date drilled: 5/04/76

Glacial drift:			
	Sand, medium to very coarse, subangular to rounded, oxidized	7	7
	Sand, medium to very coarse, subangular to rounded	13	20
	Gravel, fine to medium; about 30 percent coarse to very coarse sand; subangular to subrounded	7	27
	Till, dark-gray to olive-gray, silty, sandy	22	49
Cannonball Member:			
	Shale, brownish-gray to dark-gray, fissile; interbedded with lenses of gray sandy siltstone; with carbonaceous streaks	31	80

153-078-01ADD
Missile Site A-10
(Log modified from J. N. Pitcher Drilling Co.)

Altitude:	1555 feet	Date drilled:	7/10/61
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, brown, silty, oxidized	11	11
Cannonball Member:			
	Shale, dark-gray, silty	5	16
	Siltstone, gray, sandy	3	19
	Sandstone, fine, dark-gray, silty	20	39
	Sandstone, fine, grayish-black; interbedded with shale	9	48
	Shale, dark-gray, silty to sandy	10	58
	Sandstone, fine, gray, silty	3	61
	Shale, gray, silty	28	89
	Sandstone, dark-gray, silty, partially indurated	5	94
	Shale, gray, silty	6	100

153-078-01BBB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1547 feet	Date drilled:	8/18/70
Glacial drift:			
	Topsoil, dark-brown, silty, sandy	1	1
	Sand, brown; about 85 to 90 percent coarse to predominantly medium and fine sand; 10 to 15 percent fines; about 5 percent fine gravel to 10 feet; trace of clay	18	19
	Till, gray, sandy, silty; scattered gravel and lignite fragments	31	50

153-078-02BAA
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Altitude:	1552 feet	Date drilled:	5/19/75
	Topsoil	3	3
	Yellow till	2	5
	Coarse sand and fine gravel	7	12
	Gray sand and medium gravel	6	18
	Gray sand and large gravel	5	23
	Gray sand and medium gravel	29	52
	Gray clay	6	58
	Green clay	2	60
	Gray hard clay	6	66
	Green clay	1	67
	Gray hard clay	13	80

153-078-02CBD
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/26/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Brown sandy till	5	7
	Yellow till and fine gravel	7	14
	Blue clay	8	22
	Black clay	3	25
	Green sandy clay	21	46
	Boulder	2	48
	Brown clay	4	52
	Green sandy clay	10	62
	Brown hard clay	39	101
	White hard clay	6	107
	Gravel, with clay	10	117
	Black hard clay	3	120

153-078-02CDC
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/26/75

	Topsoil	2	2
	Brown sandy till	3	5
	Sand	3	8
	Coarse sand and lignite	9	17
	Coarse sand and fine gravel	6	23
	Lignite	1	24
	Gray sand and fine gravel	10	34
	Medium gravel; trace of clay	3	37
	Black clay	13	50
	Green clay	25	75

153-078-03BAA1
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 10/11/76

	Topsoil	1	1
	Yellow till	2	3
	Medium and coarse gravel	15	18
	Clay; with coarse gravel	7	25
	Coarse gravel and sand	25	50

153-078-03BAA2
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/26/75

	Topsoil	1	1
	Sand	3	4
	Coarse sand and medium gravel	19	23
	Gray medium gravel and sand	10	33
	Coarse gravel	6	39
	Gray clay	3	42

153-078-03BAA3
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 10/10/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Yellow till	2	3
	Medium and coarse gravel	15	18
	Clay; with coarse gravel	7	25
	Coarse gravel and sand	25	50

153-078-04BCC
NDSWC 5847

Altitude: 1580 feet — Date drilled: 9/29/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, sandy, oxidized	24	25
	Till, olive-gray, silty, slightly sandy	5	30
Cannonball Member:			
	Shale, dark-gray, moderately indurated; bedded	18	48
	Sandstone, gray, very fine to fine, micaceous, calcareous, indurated	4	52
	Shale, dark-gray, calcareous, moderately indurated; bedded	8	60

153-078-05BBB
(Log modified from U.S. Bureau of Reclamation)

Altitude. 1582 feet — Date drilled: 8/04/70

Glacial drift:			
	Topsoil, dark-gray to black	1	1
	Till, tan, oxidized; leached to 5 feet; brown and oxidized to 7 feet; spotty oxidation below decreasing with depth; sandy at 23, 31, and 34 feet; scattered lignite fragments and fine gravel	35	36
Cannonball Member:			
	Shale, dark-gray, firm, nonindurated; silty and sandy laminations throughout	15	51

153-078-05DDD
NDSWC 5841

Altitude: 1605 feet — Date drilled: 9/29/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, sandy, oxidized; some cobbles	41	42
	Till, olive-gray, sandy	11	53
Cannonball Member:			
	Sandstone, dark-gray, very fine to fine; interbedded with brownish-gray fissile shale	17	70
	Sandstone, bluish-gray, fine, micaceous, calcareous, indurated	2	72
	Shale, brownish-gray to dark-gray, calcareous, moderately indurated	8	80

153-078-06ACB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1591 feet — Date drilled: 7/31/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	0.5	0.5
	Clay, brown; 35 percent predominantly fine sand	1.3	1.8
	Clay, yellowish-brown; 25 percent predominantly fine sand	3.2	5
	Till, yellowish-brown; 30 percent medium to fine sand; trace of fine gravel	15	20
	Sand, yellowish-brown; estimate 70 percent coarse to predominantly fine sand	3	23
	Till, yellowish-brown; 30 percent medium to fine sand; trace of fine gravel	3	26
	Sand, yellowish-brown, silty; estimate 60 percent predominantly fine sand; trace of gravel	3	29
	Clay, yellowish-brown; 15 percent predominantly fine sand; buried soil horizons	1	30
Cannonball Member:			
	Shale, gray; unindurated to 38 feet; partially indurated below; contains thin alternating light-gray silty clay shale and dark-gray clay shale	20	50

153-078-08DDD
NDSWC 5844

Altitude: 1605 feet — Date drilled: 9/29/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, sandy, oxidized	30	31
Cannonball Member:			
	Shale, bluish-gray to brownish-gray, sandy, moderately indurated	29	60

153-078-11BBA
NDSWC 9557

Altitude: 1540 feet — Date drilled: 5/19/76

	Gravel, fine to medium, sandy, subrounded to rounded, oxidized	26	26
Cannonball Member:			
	Sandstone, greenish-gray, very fine to fine, clayey	14	40

153-078-13DDD
NDSWC 9556

Altitude: 1545 feet — Date drilled: 5/19/76

	Gravel, medium to coarse, subrounded to rounded, oxidized	28	28
	Till, olive-gray, silty, sandy	2	30
Cannonball Member:			
	Shale, dark-brown, carbonaceous, fissile	10	40

153-078-18DAA
Missile Site B-3
(Log from J. N. Pitcher Drilling Co.)

Altitude: 1612 feet — Date drilled: 4/20/61

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Till, brown, silty to sandy, oxidized	18	18
	Till, grayish-brown, silty, gravelly	16	34
Cannonball Member:			
	Sandstone, light-gray, indurated	5	39
	Sandstone, fine, light-gray, silty	25	64
	Siltstone, gray, sandy, clayey	6	70
	Sandstone, light-gray, indurated	3	73
	Sandstone, gray; interbedded with dark-gray shale	7	80
	Sandstone, fine, dark-gray, silty	21	101

153-078-19CBB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1569 feet — Date drilled: 1/28/70

Glacial drift:			
	Topsoil; dark brown with reddish tinge	6.5	6.5
	Sand, variable tan to rusty brown; predominantly fine sand; trace of clay in zones; coarser from 16 to 17 feet	10.5	17
	Till, gray, sandy and silty; occasional fine gravel and lignite fragments	1	18
	Sand, gray; about 80 to 95 percent predominantly fine sand; some scattered medium and coarse grains with occasional fine gravel; trace of clay; interbedded till finger and sand lenses from 20 to 22 feet	9	27
	Till, light-gray to dark-gray, sandy and silty; occasional fine gravel; scattered lignite fragments	8	35

153-078-19CDD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1574 feet — Date drilled: 7/21/55

Glacial drift:			
	Topsoil	1	1
	Sand, tan and buff, silty; fine uniform sand; occasional gravel	15	16
	Sand, brown, fine to medium, fairly clean, cohesionless, oxidized; trace of silt in zones	4	20
	Till, gray, silty; sand lenses	10	30

153-078-22BAB
(Log from Farmers Supply Company)

Altitude: 1610 feet — Date drilled: 10/18/74

	Sand	3	3
	Yellow sandy clay	27	30
	Gray clay	24	54
	Gray sand	18	72
	Gray clay	11	83
	Sandstone	2.5	85.5
	Green sand	24.5	110

153-078-29AAA
NDSWC 5845

Altitude: 1620 feet — Date drilled: 9/29/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, silty	1	1
	Till, yellowish-brown, sandy, oxidized	28	29
	Gravel, fine to coarse, angular to rounded, oxidized	2	31
Cannonball Member:			
	Shale, dark-gray, sandy, fissile, partially indurated	26	57
	Sandstone, bluish-gray, very fine to fine, micaceous, slightly indurated	12	69
	Shale, dark-gray, sandy, fissile, moderately indurated	11	80

153-078-29CDB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1570 feet — Date drilled: 1/27/70

Glacial drift:			
	Topsoil, black to brown, silty, sandy	1.5	1.5
	Sand, yellowish-brown; about 85 percent predominantly medium to fine sand	8.5	10
	Till, olive-gray; 35 percent predominantly medium to fine sand; 5 percent fine gravel to coarse sand; scattered lignite fragments	20	30
	Gravel, olive-gray, fine; 40 percent hard subrounded to subangular coarse to fine sand	2	32
Cannonball Member:			
	Siltstone, gray, slightly consolidated, uncemented; light-gray fine sand laminations within dark-gray fine-grained matrix	3	35

153-078-30ABD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1572 feet — Date drilled: 1/28/70

Glacial drift:			
	Topsoil, dark-brown; about 85 percent fine sand	0.5	0.5
	Sand; dark brown to 6 feet; medium brown to 13 feet; about 85 percent fine sand; little lignite slack at 12 feet	12.5	13
	Clay, tan, silty; oxidized zones; trace of fine sand and occasional lignite particle	3	16
	Till, dark-gray; till varies in sand and silt content; scattered fine gravel and lignite fragments; fine sandy and silty zones at 18 to 20, 22 to 22.5, and 33.5 to 35 feet	19	35

153-078-30BBB
NDSWC 10078

Altitude: 1560 feet — Date drilled: 11/16/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, very fine to coarse, silty, subangular, oxidized	6	7
	Sand, fine to medium, subrounded	14	21
Cannonball Member:			
	Sandstone, light-gray to medium-gray, fine; interbedded with lenses of brown carbonaceous shale	19	40

153-078-30BCC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1571 feet	Date drilled:	7/21/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	0.5	0.5
	Sand, grayish-brown, fine to medium; trace of silt	4.5	5
	Sand, tan to buff, fine, uniform, silty, oxidized; trace of clay	14	19
	Sand, gray, very fine, uniform, silty; trace of clay from 22 to 25 and 27 to 30 feet	11	30

153-078-30DAD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1569 feet	Date drilled:	1/27/70
Glacial drift:			
	Topsoil, black, silty; about 70 percent predominantly fine sand	1	1
	Sand; brown to 5 feet; yellowish brown below; about 70 percent predominantly fine sand	9	10
	Sand, yellowish-brown; about 85 percent predominantly coarse to medium sand; gravel zones at 10 to 11 and 16 to 17 feet with up to 30 percent hard subrounded fine gravel	10	20
	Sand, gray; about 85 percent predominantly medium to fine sand	7.5	27.5
	Till, olive-gray; 5 percent fine gravel to coarse sand; scattered lignite fragments	7.5	35

153-078-31BBB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1572 feet	Date drilled:	7/20/55
Glacial drift:			
	Topsoil	1.8	1.8
	Till, buff, silty, sandy; some gravel throughout; sand-rich zone from 6.3 to 8.5 feet; becoming hard and compact from 8.5 to 10 feet	8.2	10
	Till, gray, silty, sandy; with gravel; sandy zone from 11.5 to 12 feet	5	15
	Sand, gray, silty; with lenses of coarse sand and gravel	3.3	18.3
	Silt, gray; very fine silty sand in upper portion; becomes predominantly silt at 19.1 feet	3.8	22.1
	Till, gray, silty; some gravel	7.9	30

153-078-32ABD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1568 feet — Date drilled: 1/23/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, sandy, brown to 1 foot; gray from 1 to 2.5 feet	2.5	2.5
	Sand, yellowish-brown; about 80 percent predominantly fine sand and 20 percent nonplastic fines	5	7.5
	Till, olive-gray, silty; about 35 percent coarse to fine sand; scattered lignite fragments	4	11.5
	Sand, gray, silty; about 70 percent predominantly fine sand and 30 percent nonplastic fines; scattered lignite particles in sand	2.5	14
	Sand, gray; about 75 percent predominantly medium to coarse subrounded to subangular sand; 5 percent angular fine gravel	1	15
	Clay, gray; about 30 percent coarse to predominantly fine sand	10.5	25.5
Cannonball Member:			
	Shale, dark-gray, slightly consolidated, uncemented; with light-gray silt and sand laminations scattered throughout	14.5	40
	Shale, gray, unconsolidated, uncemented; gradational from the shale above	3	43
	Sandstone, slightly consolidated, soft, uncemented; consisting of about 80 percent predominantly fine to medium sand and 20 percent fines	7	50

153-078-32DAA
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1574 feet — Date drilled: 1/06/70

Glacial drift:			
	Topsoil, black to dark-brown, silty, sandy	4.5	4.5
	Sand, brown, fine; trace of clay from 5 to 5.5 feet	4.5	9
	Sand, brown, fine, uniform, silty, clean; becoming gray at 13 feet; with occasional medium grains and fine gravel; till from 14 to 16 feet	9	18
	Sand, gray; estimate 20 to 30 percent fine gravel	4	22
	Till, gray, silty, sandy; gravels throughout; occasional lignite fragment	13	35

153-078-33BCB
NDSWC 5846

Altitude: 1578 feet — Date drilled: 9/29/70

Cannonball Member:			
	Topsoil, brownish-black, sandy	1	1
	Shale, yellowish-brown, fissile, oxidized	11	12
	Shale, dark-gray, slightly sandy, moderately indurated	28	40

153-078-33CCD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1576 feet — Date drilled: 12/18/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, dark-brown, silty, sandy	3	3
	Sand, brown, silty; estimate 80 percent fine sand and 20 percent nonplastic fines; trace of clay	10	13
	Sand, gray; estimate 70 to 80 percent predominantly fine sand with little medium and coarse and fine gravel; some clay and lignite fragments top 2 feet; coarser from 23 to 24 feet	11	24
	Till, gray, sandy, silty; approximately 5 percent fine gravel and lignite fragments	11	35

153-078-36DDD
NDSWC 9529

Altitude: 1644 feet — Date drilled: 5/04/76

Glacial drift:			
	Till, yellowish-brown, silty to very sandy, oxidized	22	22
	Till, olive-gray; with lenses of fine sand	10	32
Cannonball Member:			
	Shale, dark-gray to grayish-black, carbonaceous; interbedded with thin lenses of dark-gray very fine to fine sandstone	68	100

153-079-01ADD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1584 feet — Date drilled: 6/28/70

Glacial drift:			
	Topsoil, brown; 10 percent predominantly fine sand	0.5	0.5
	Clay, yellowish-brown, moist; 20 percent coarse to fine sand	2	2.5
	Till, yellowish-brown; 25 percent coarse to fine sand; 5 percent gravel	9.5	12
	Sand, yellowish-brown, estimate 75 percent well-graded sand; trace of gravel	2	14
	Till, gray; 30 percent coarse to fine sand; trace of gravel	3	17
	Sand, gray; estimate 60 percent fine sand and 40 percent nonplastic fines; thin clay partings 1/8 inch and less in lower portion, these partings may impart some plasticity to bulk samples	3	20
	Till, gray; 20 to 30 percent coarse to fine sand; 10 to 20 percent coarse to fine gravel	5.5	25.5
Cannonball Member:			
	Shale, gray, unindurated; alternating silty clay shale and clay shale	24.5	50

153-079-01BCC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1583 feet	Date drilled:	1/28/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	2	2
	Till, brown, very silty; sand zone from 3 to 4 feet	3	5
	Clay, tan; little sand and silt; limey inclusions	1	6
	Till, grayish-brown; 20 percent predominantly fine sand with occasional fine gravel and lignite fragments; scattered lime inclusions	9	15
	Sand, brown; about 95 percent fine sand and 5 percent fines; till finger from 19 to 20 feet	9	24
Cannonball Member:			
	Shale, dark-gray, slightly consolidated, soft, uncemented; becomes firm with depth	11	35

153-079-01CDC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1590 feet	Date drilled:	7/26/55
Glacial drift:			
	Topsoil	0.3	0.3
	Till, gray and brown, silty, sandy; fine to coarse gravel and lignite fragments throughout	14.7	15
	Till, gray and brown, coarse; sand, gravel, lignite, and clay mixture	1	16
	Till, gray and brown; same as till from 0.3 to 15 feet	4	20
	Till, gray, silty; with few brown streaks; occasional fine gravel; gypsum from 28 to 35 feet; heavy gypsum concentration at 34 feet; slightly oxidized to 35 feet	15	35
Cannonball Member:			
	Shale, gray, silty; with sandy zones throughout; no evidence of cementation	11.5	46.5
	Sandstone	4.5	51
	Sand, gray, fine to medium, silty	4	55

153-079-02BAC
(Log modified from Farmers Supply Company)

		Date drilled:	10/22/74
	Gray and yellow clay	49	49
	Sandstone	1	50
	Gray sandy clay	4	54
	Gray medium sand	36	90

153-079-06DDD
NDSWC 10071

Altitude: 1515 feet — Date drilled: 11/15/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, fine to coarse, predominantly medium, subrounded, oxidized	19	20
Cannonball Member:			
	Sandstone, greenish-gray, very fine to medium, clayey, partially indurated	2	22
	Shale, dark-brown, carbonaceous, fissile	2	24
	Sandstone, grayish-green, very fine to fine, clayey, poorly indurated	8	32
	Shale, dark-grayish-black, fissile, slightly indurated	8	40

153-079-07ABB
(Log from R & F Drilling & Supply)

Date drilled: 8/20/76

Black dirt	1	1
Clay	23	24
Blue clay and fine sand	21	45
Fine sand	20	65
Blue clay	40	105
Blue clay; lensed with fine sand	140	245

153-079-08BCC
NDSWC 10072

Altitude: 1495 feet — Date drilled: 11/15/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy, oxidized	6	7
	Sand, fine to medium, subrounded, oxidized	19	26
	Sand, fine, silty; fossil fragments	6	32
	Sand, fine to medium, subrounded	8	40
	Clay, olive-gray, silty	27	67
	Sand, medium, uniform, subrounded	2	69
	Clay, dark-gray, silty to sandy	3	72
	Sand, fine to medium, silty; interbedded with silty to sandy clay; abundant detrital lignite	52	124
Hell Creek Formation:			
	Shale, dark-brownish-gray, carbonaceous; interbedded with grayish-green very fine to medium clayey partially indurated sandstone	16	140

153-079-10D
(Log from Russell Drilling Co.)

Altitude:	1575 feet	Date drilled:	2/14/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Gravel	3	3
	Brown till	8	11
	Blue till	10	21
	Sand	3	24
	Till	21	45
	Bedrock sand	7	52
	Limestone	1	53
	Shale	9	62

153-079-11DDD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1588 feet	Date drilled:	7/25/55
Glacial drift:			
	Topsoil	0.2	0.2
	Till, buff, silty, sandy; fine to medium gravel; occasional lignite fragments	6.8	7
	Silt, buff and brown; with some very fine sand; numerous silty clay lenses throughout; oxidized to 15 feet	8	15
	Clay, dark-gray, silty, very hard; with silty fine sand lenses throughout; few gravels from 32 to 33 feet	30	45

153-079-12BBB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1595 feet	Date drilled:	1/29/70
Glacial drift:			
	Topsoil	1	1
	Till, brown, sandy, silty, oxidized to 3.5 feet; sand and fine gravel zone from 22 to 24 feet; thin lignite slack lens at 22 feet; occasional scattered fine gravel and lignite fragments	24.5	25.5
	Sand, brown; with gray laminations; about 60 to 70 percent very fine sand and 30 to 40 percent nonplastic to slightly plastic fines	1	26.5
Cannonball Member:			
	Sandstone, gray, unconsolidated; clay shale laminations up to 1/2 inch in thickness	8.5	35
	Shale, gray to olive-gray, unconsolidated; sand lamination with few sand lenses to 0.4 feet	9	44
	Sandstone, gray, unconsolidated; thin clay shale laminations	1	45

153-079-12BCC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1606 feet	Date drilled:	1/29/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Till, brown; grading to gray at 27 feet; oxidized to 27 feet	30	31
Cannonball Member:			
	Sandstone, gray, very clayey, slightly consolidated	15	46
	Shale, gray to olive-gray, slightly consolidated; numerous sand laminations	9	55

153-079-13BBB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1593 feet	Date drilled:	2/05/70
Glacial drift:			
	Topsoil	1	1
	Till, brown; little sand and silt; occasional fine gravel and lignite fragments	9	10
Cannonball Member:			
	Sandstone, unconsolidated, uncemented; brown to 15 feet; gray below; very clayey with clay laminations; oxidized to 15 feet; clay shale laminations and lenses	30	40
	Shale, dark-gray to olive-gray, unconsolidated; sandy zones with sand laminations	5	45

153-079-13BDC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1592 feet	Date drilled:	2/05/70
Glacial drift:			
	Topsoil	3	3
	Till, brown, sandy, silty, oxidized; limey inclusions to 6 feet; scattered gravel and lignite fragments; sand lens at 8 feet	6	9
	Clay, brown, micaceous, oxidized; 40 percent very fine sand; occasional lignite fragment	7	16
	Sand, brown; about 90 percent fine sand and 10 percent slightly to moderately plastic fines; few gravel from 16 to 18 feet; clay laminations increase near bottom	9	25
Cannonball Member:			
	Sandstone, gray, fine, clayey, unconsolidated, uncemented; cemented from 33 to 34 feet; occasional thin clay lens	9	34
	Shale, dark-gray to olive-gray, unconsolidated; numerous sandy laminations	11	45

153-079-13CDD
(Log modified from U.S. Bureau of Reclamation)

Altiutde:	1572 feet	Date drilled:	2/06/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, dark-brown, silty, sandy	6	6
	Sand, brown; about 85 percent fine sand and 15 percent nonplastic fines	3	9
	Sand, grayish-brown; about 90 percent fine sand and 10 percent low plasticity fines	6.5	15.5
Cannonball Member:			
	Sandstone, gray, clayey, unconsolidated, moderately firm, uncemented	6	21.5
	Shale, dark-gray, sandy, unconsolidated	6.5	28
	Sandstone, gray, clayey, unconsolidated, uncemented; with greenish tinge	7	35

153-079-13DCC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1590 feet	Date drilled:	7/25/55
Glacial drift:			
	Topsoil	1.2	1.2
	Sand, brown to tan, silty; fine and medium trace of clay; occasional gravel	11.3	12.5
	Till, tan, silty, very sandy; few gravels	5.5	18
	Till, tan, silty, sandy; some gravel; oxidized to 20 feet	2	20
	Sand, gray, very fine, silty, compact; trace of clay to 25 feet; becoming clayey from 25 to 31.8 feet; lenses of dark-gray organic silty plastic clay from 25 to 31.8 feet	11.8	31.8
	Till, gray, silty, sandy, slightly oxidized; with brown lenses; fine gravel	1.2	33

153-079-16BCB
Missile Site B-2
(Log modified from J. N. Pitcher Drilling Co.)

Altitude: 1616 feet — Date drilled: 5/21/61

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Till, gray to brown, silty	18	18
	Till, brownish-gray, silty to sandy; sand and gravel lens from 30 to 31 feet	19	37
Cannonball Member:			
	Shale, gray, silty	3	40
	Shale, grayish-brown; interbedded with thin crossbedded siltstone	8	48
	Siltstone and sandstone, fine, dark-gray, clayey	10	58
	Shale, dark-gray, silty	10	68
	Shale, dark-gray; interbedded with siltstone	7	75
	Sandstone, fine, dark-gray, silty	5	80
	Siltstone, gray, sandy; interbedded with shale	4	84
	Siltstone and sandstone, gray, clayey	14	98
	Shale, dark-gray, silty to sandy	3	101

153-079-24ADD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1582 feet — Date drilled: 7/22/55

Glacial drift:			
	Topsoil	2.5	2.5
	Sand, grayish-brown, fine to medium, silty	4.2	6.7
	Till, buff, silty, sandy; fine gravel and lignite fragments	.3	7
	Sand, brown, fine, silty, trace of clay	2.8	9.8
	Till, buff, silty, sandy	1	10.8
	Sand, brown, fine, silty; till lens at 11.3 feet	1	11.8
	Till, buff, silty, sandy; oxidized to 15 feet	3.2	15
	Till, gray, silty, sandy; fine gravel throughout; occasional lignite fragments	9.3	24.3
Cannonball Member:			
	Sandstone, gray, fine, silty; with lenses and streaks of silty organic plastic clay	5.7	30

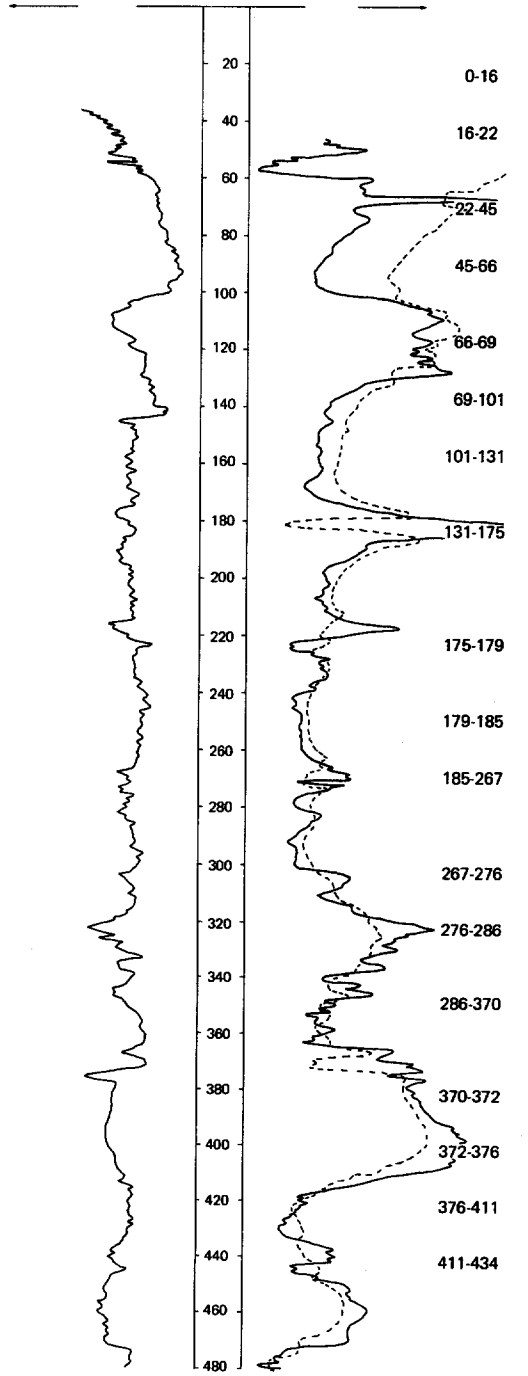
NDSWC 4975

LOCATION: 153-079-30AAA1

DATE DRILLED: 9/03/76

ALTITUDE: 1595
(FT, NGVD)

DEPTH: 720
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-16	Till, yellowish-brown, silty to sandy, oxidized.
16-22	Sand, fine to very coarse; about 40 percent gravel; angular to subangular.
22-45	Till, dark-gray to olive-gray, sandy to gravelly.
45-66	Clay, dark-brownish-gray, very silty.

CANNONBALL MEMBER

66-69	Sandstone, greenish-gray, fine to medium, cemented.
69-101	Shale, medium-dark-gray, very silty, bentonitic.
101-131	Sandstone, grayish-green, very fine to fine, clayey; carbonaceous streaks.
131-175	Shale, dark-brownish-gray, carbonaceous; interbedded with greenish-gray sandy siltstone.

HELL CREEK FORMATION

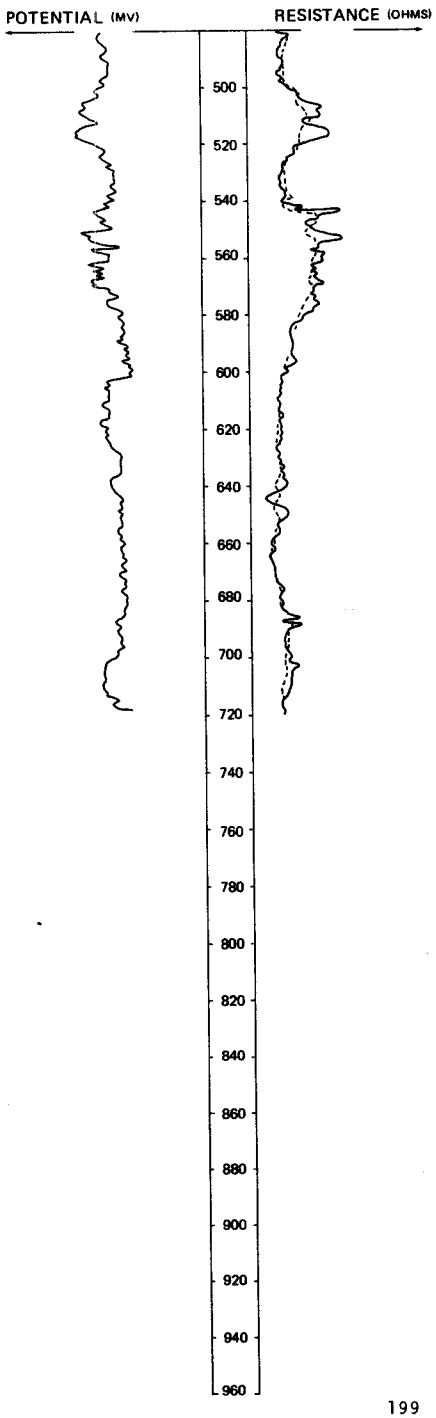
175-179	Sandstone, dark-greenish-gray, very fine, clayey; bentonitic lenses; carbonaceous streaks.
179-185	Sandstone, greenish-gray, very fine to fine, clayey, cemented.
185-267	Sandstone, dark-greenish-gray, very fine, clayey; interbedded with greenish-gray siltstone and carbonaceous shale.
267-276	Sandstone, greenish-gray, very fine to fine, clayey.
276-286	Siltstone, greenish-gray, bentonitic; interbedded with thin lenses of greenish-gray very fine sandstone.
286-370	Shale, gray to dusky-brown; very lignitic in places; interbedded with gray siltstone and gray very fine sandstone.
370-372	Sandstone, greenish-gray, fine, cemented.
372-376	Shale, grayish-brown, silty, sandy, carbonaceous.
376-411	Sandstone, light-greenish-gray, very fine to fine, clayey.
411-434	Shale, grayish-brown, silty, carbonaceous; sandstone concretions.

LOCATION: 153-079-30AAA1

DATE DRILLED: 9/03/76

ALTITUDE: 1595
(FT, NGVD)

DEPTH: 720
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

434-472	Sandstone, grayish-green, fine to medium, subrounded to rounded, glauconitic, partially indurated.
472-542	Shale, dusky-brown, silty, carbonaceous; interbedded with dark-gray sandstone.
542-578	Sandstone, dark-grayish-green, fine to medium, clayey, glauconitic.
578-674	Shale, dark-brownish-gray, carbonaceous, very bentonitic, sticky; interbedded with greenish-gray siltstone to 635 feet.

PIERRE SHALE

674-720	Shale, grayish-black, siliceous, brittle; with occasional thin lenses of bentonite.

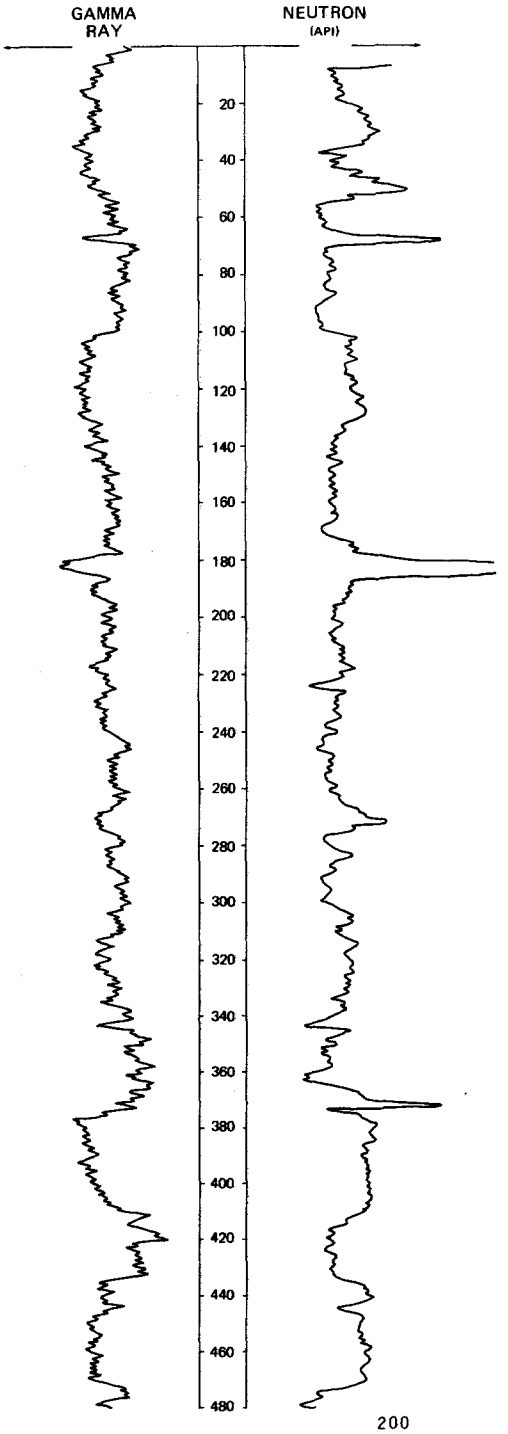
NDSWC 4975, Continued

LOCATION: 153-079-30AAA1

DATE DRILLED: 9/03/76

ALTITUDE: 1595
(FT, NGVD)

DEPTH: 720
(FT)



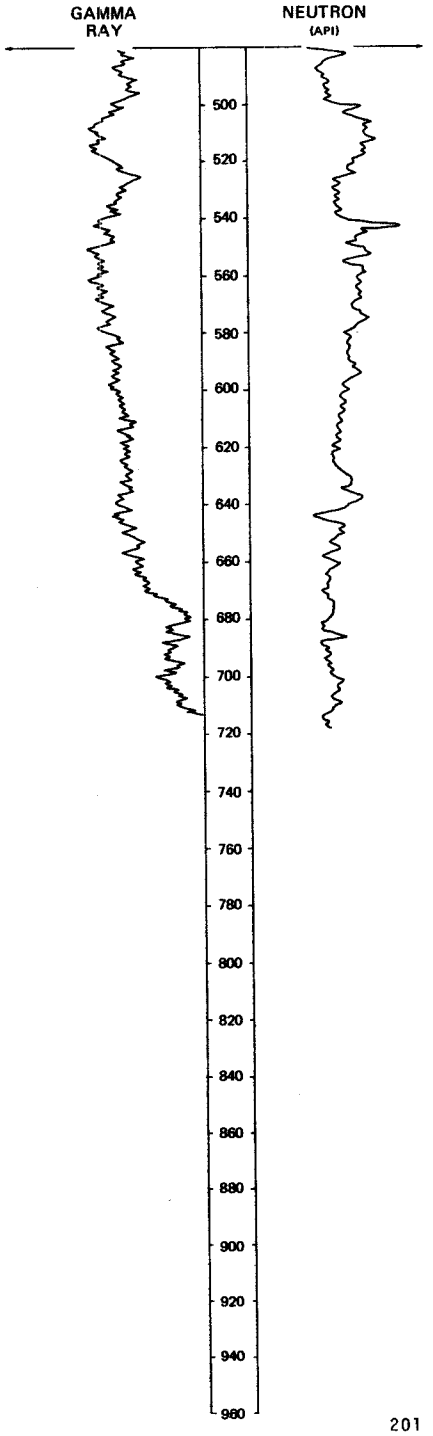
DESCRIPTION OF DEPOSITS

LOCATION: 153-079-30AAA1

DATE DRILLED: 9/03/76

ALTITUDE: 1595
(FT, NGVD)

DEPTH: 720
(FT)



DESCRIPTION OF DEPOSITS

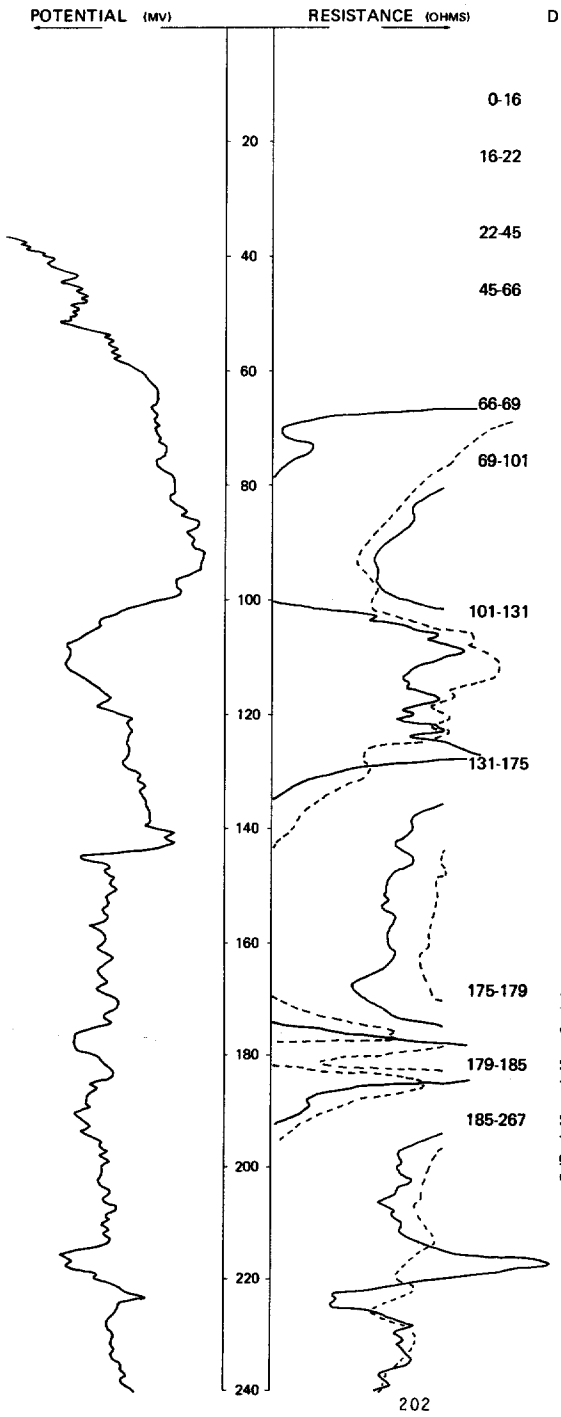
NDSWC 4975A, 4975B

LOCATION: 153-079-30AAA2, 3

DATE DRILLED: 9/08/76

ALTITUDE: (FT, NGVD) 1595

DEPTH: (FT) 410



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-16 Till, yellowish-brown, silty to sandy, oxidized.

16-22 Sand, fine to very coarse; about 40 percent gravel; angular to subangular.

22-45 Till, dark-gray to olive-gray, sandy to gravelly.

45-66 Clay, dark-brownish-gray, very silty.

CANNONBALL MEMBER

66-69 Sandstone, greenish-gray, fine to medium, cemented.

69-101 Shale, medium-dark-gray, very silty, bentonitic.

101-131 Sandstone, grayish-green, very fine to fine, clayey; carbonaceous streaks.

131-175 Shale, dark-brownish-gray, carbonaceous; interbedded with greenish-gray sandy siltstone.

HELL CREEK FORMATION

175-179 Sandstone, dark-greenish-gray, very fine, clayey; bentonitic lenses; carbonaceous streaks.

179-185 Sandstone, greenish-gray, very fine to fine, clayey, cemented.

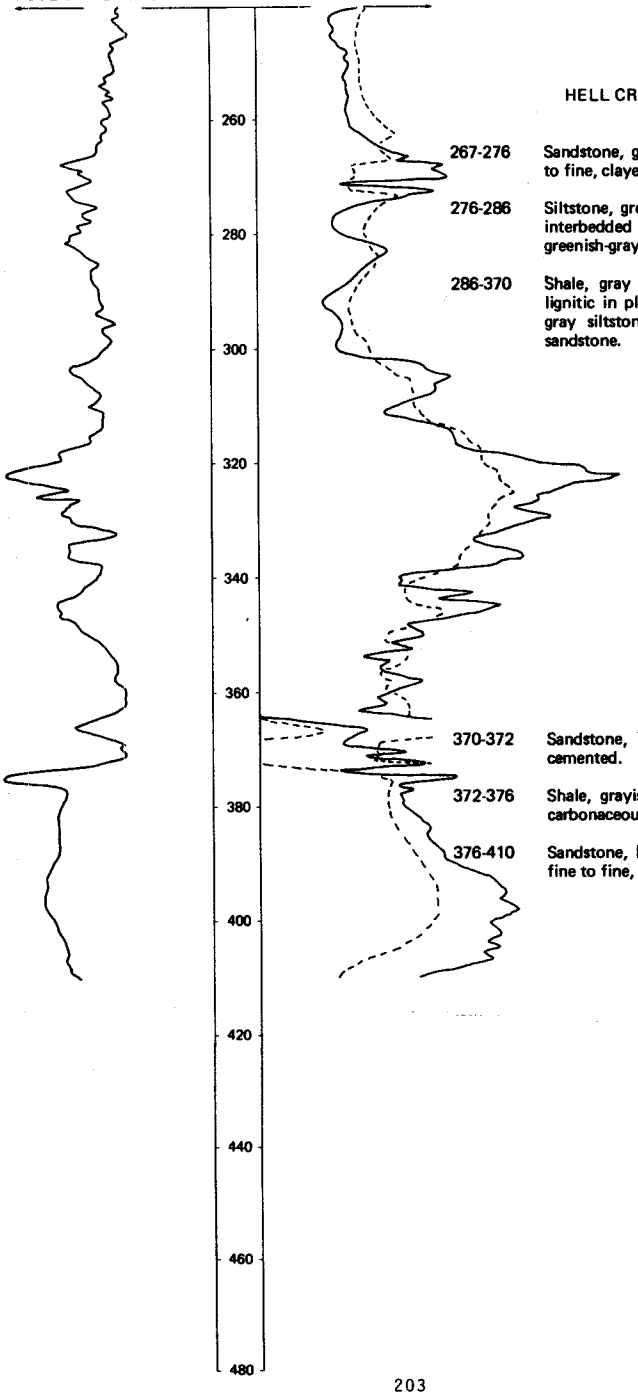
185-267 Sandstone, dark-greenish-gray, very fine, clayey; interbedded with greenish-gray siltstone and carbonaceous shale.

LOCATION: 153-079-30AAA2, 3

DATE DRILLED: 9/08/76

ALTITUDE: (FT, NGVD) 1595

DEPTH: (FT) 410



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

267-276	Sandstone, greenish-gray, very fine to fine, clayey.
276-286	Siltstone, greenish-gray, bentonitic; interbedded with thin lenses of greenish-gray very fine sandstone.
286-370	Shale, gray to dusky-brown; very lignitic in places; interbedded with gray siltstone and gray very fine sandstone.
370-372	Sandstone, greenish-gray, fine, cemented.
372-376	Shale, grayish-brown, silty, sandy, carbonaceous.
376-410	Sandstone, light-greenish-gray, very fine to fine, clayey.

153-080-02BBB
NDSWC 1386

Altitude: 1605 feet — Date drilled: 9/12/58

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Till, yellowish-brown, gravelly, oxidized	18	19
	Till, medium-dark-gray, gravelly; cobbles	32	51
	Gravel, fine; about 40 percent coarse sand; subrounded	9	60
	Till, gray, gravelly	14	74
Cannonball Member:			
	Shale, dark-gray, sandy	10	84

153-080-03CBB
(Log modified from North Dakota Geological Survey)

Altitude: 1648 feet — Date drilled: 7/21/70

	Sand, tan, very fine to silty	9	9
	Sand, very fine to coarse	10	19
	Sand, brown, fine, very well sorted	5	24
	Sand, fine to medium	5	29
	Sand, medium to coarse; a few pebbles	5	34
	Sand, fine, well-sorted	4	38
	Till (a few balls), brown	1	39
	Till, gray; hard drilling	5	44
	Till; appears partially oxidized	5	49

153-080-03DDD1
(Log modified from North Dakota Geological Survey)

Altitude: 1615 feet — Date drilled: 7/21/70

	Till, brownish-gray	7	7
	Till, brownish-gray; rusty stains	12	19
	Gravel; cobbles up to 3 inches in diameter	10	29
	Sand, wet	3	32
	Till	2	34
	Till, gray	5	39
	Till, gray, sandy	5	44
	Till, gray, silty	5	49

153-080-03DDD2
NDSWC 5834

Altitude:	1615 feet	Date drilled:	9/24/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy, oxidized; some cobbles	19	20
	Gravel, fine to coarse, silty to sandy, subrounded, oxidized	8	28
	Till, dark-yellowish-brown, sandy, oxidized	7	35
	Till, olive-gray, silty, slightly sandy	23	58
	Gravel, fine to coarse, sandy, clayey, angular to subrounded	14	72
Cannonball Member:			
	Shale, dark-gray, silty, sandy, indurated	28	100

153-080-05CCC
NDSWC 5838

Altitude:	1605 feet	Date drilled:	9/25/70
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, sandy, oxidized	27	28
	Till, dark-gray, sandy; some cobbles	35	63
Cannonball Member:			
	Shale, medium-gray, slightly sandy, indurated	17	80

153-080-14BBB
NDSWC 5835

Altitude:	1635 feet	Date drilled:	9/25/70
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy to gravelly, oxidized	45	46
	Sand, very fine to very coarse, silty, clayey, angular to subrounded, oxidized	29	75
	Gravel, fine to coarse, sandy, angular to well-rounded; some cobbles	27	102
Cannonball Member:			
	Shale, dark-gray, calcareous, moderately indurated; light-gray mottling	18	120

153-080-14CBB
NDSWC 5836

Altitude:	1610 feet	Date drilled:	9/25/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy, gravelly, oxidized	41	42
	Gravel, fine to coarse, sandy, angular to well-rounded; some cobbles and boulders	33	75
	Till, olive-gray, very silty, sandy	8	83
Cannonball Member:			
	Sandstone, dark-greenish-gray, very fine, calcareous, well-indurated	2	85
	Shale, dark-gray, sandy, calcareous, moderately indurated	15	100

153-080-22AAD
NDSWC 1382

Altitude:	1510 feet	Date drilled:	9/10/58
Glacial drift:			
	Topsoil, black	1	1
	Sand, fine and medium	25	26
Cannonball Member:			
	Shale, gray, sandy	18	44

153-080-22CDB
(Log modified from Leo Erck Well Drilling)

		Date drilled:	5/15/72
	Black soil	1	1
	Yellow clay	9	10
	Gray clay	110	120
Hell Creek Formation:			
	Shale; with fine sand	8	128

153-080-25CDC
(Log modified from Nick Erck Well Drilling)

		Date drilled:	9/22/73
	Black topsoil	2	2
	Gravel and sand	36	38
	Gray clay	102	140
	Blue sand	10	150

153-080-27DDA
Missile Site B-11
(Log modified from E. J. Longyear Drilling Co.)

Altitude: 1653 feet — Date drilled: 4/21/61

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Till, brown, silty, oxidized	8	8
	Silt and sand, fine, brown, oxidized	5	13
	Sand, fine to medium, brown, silty, oxidized	5	18
	Sand, medium to coarse, brown, silty, oxidized	12	30
	Silt, brown, sandy, oxidized	3	33
	Clay and silt, dark-brown to gray, sandy	12	45
Cannonball Member:			
	Sandstone, fine; interbedded with gray siltstone	3	48
	Siltstone, gray, sandy, clayey	6	54
	Sandstone, fine, gray, silty, lignitic	16	70
	Shale, gray; interbedded with thin lenses of siltstone	20	90
	Sandstone, fine, dark-gray, silty	4	94
	Shale, dark-gray, silty	6	100

153-080-36AAC1
(Log modified from C. A. Simpson & Son)

Date drilled: 3/10/73

Gravel	35	35
Medium sand	50	85
Fine clayey sand	7	92
Medium sand	10	102
Clay	----	102

153-080-36AAC2
(Log from C. A. Simpson & Son)

Date drilled: 6/08/73

Gravel	35	35
Medium sand	50	85
Clayey sand	7	92
Sand	10	102

153-080-36AAC3
(Log modified from C. A. Simpson & Son)

Date drilled: 2/15/73

Gravel	35	35
Medium sand	50	85
Fine clayey sand	7	92
Medium sand	10	102

153-080-36AB
(Log from C. A. Simpson & Son)

Date drilled: 2/09/73

Gravel	26	26
Blue clay	49	75

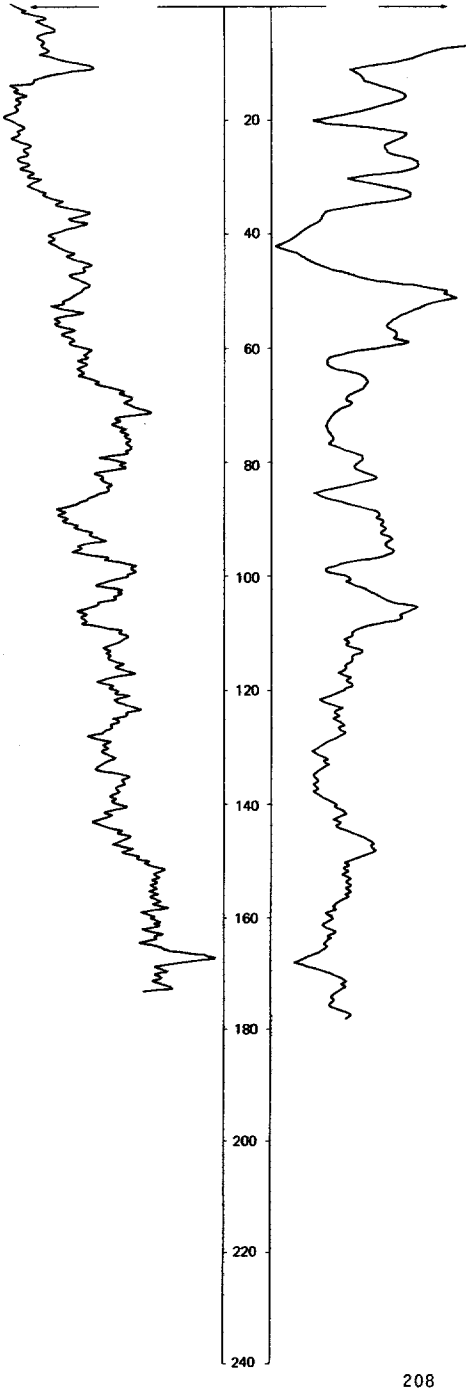
NDSWC 4991, 4991A

LOCATION: 154-075-04AAA1, 2

DATE DRILLED: 9/24/76

ALTITUDE: 1508 (FT, NGVD)

DEPTH: 180 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-25	Sand, fine to very coarse, subangular to subrounded, oxidized.
25-35	Sand, fine to very coarse; about 30 percent fine to medium gravel; subangular to subrounded.
35-54	Till, dark-olive-gray, silty, sandy, pebbly.

FOX HILLS SANDSTONE

54-67	Sandstone, greenish-gray, fine, slightly glauconitic.
67-83	Siltstone, medium-dark-gray, clayey, sandy.
83-150	Sandstone, green, very fine to fine, glauconitic; scattered thin lenses of siltstone.
150-180	Siltstone, brownish-gray, sandy; abundant carbonaceous streaks.

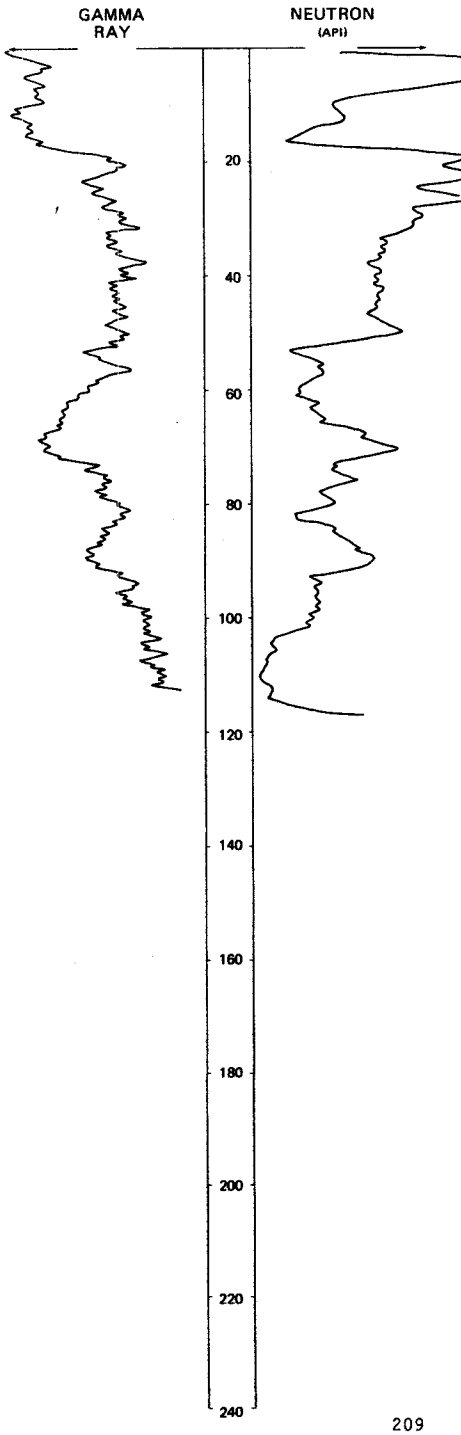
NDSWC 4992

LOCATION: 154-075-16AAA

DATE DRILLED: 9/24/76

ALTITUDE: 1512 (FT, NGVD)

DEPTH: 120 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18	Sand, fine to coarse, mostly medium, subrounded to rounded; oxidized to 5 feet.
18-58	Till, dark-gray, silty, sandy, pebbly.
58-72	Silt, dark-gray, sandy, clayey.

FOX HILLS SANDSTONE

72-97	Sandstone, greenish-gray to dark-green, fine, glauconitic.
97-120	Siltstone, brownish-gray, clayey, sandy; carbonaceous streaks.

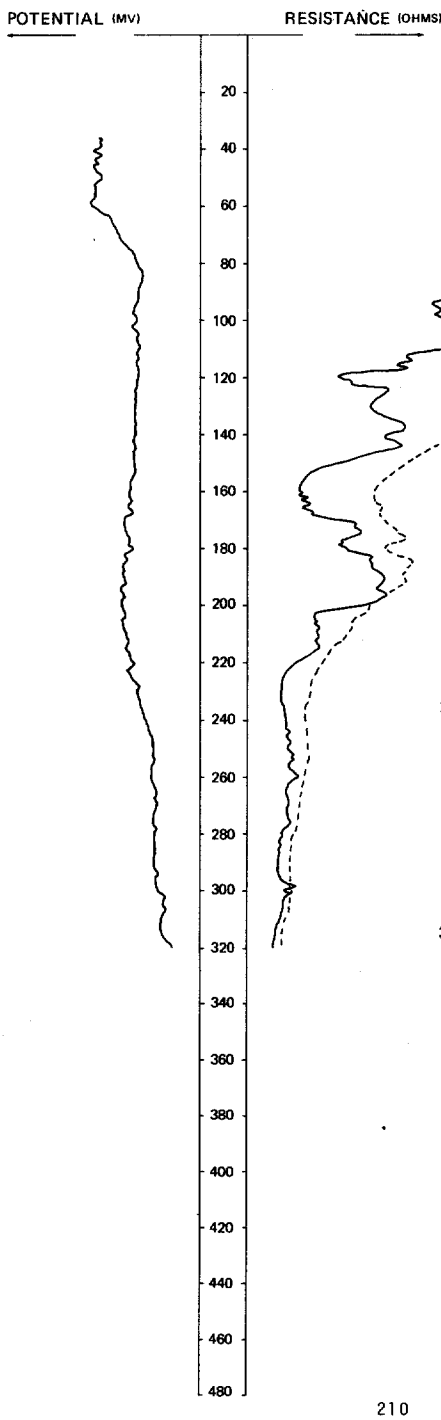
NDSWC 4993, 4993A

LOCATION: 154-075-21CDD1, 2

DATE DRILLED: 9/24/76

ALTITUDE: 1550 (FT, NGVD)

DEPTH: 320 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Till, yellowish-brown, sandy, gravelly, oxidized.

20-48 Till, dark-olive-gray, sandy, gravelly.

48-62 Sand, fine to very coarse, mostly coarse, subangular to subrounded, moderately well sorted.

FOX HILLS SANDSTONE

62-115 Sandstone, greenish-gray, fine; carbonaceous streaks.

115-122 Siltstone, brownish-gray, sandy, partially indurated.

122-149 Sandstone, greenish-gray, fine to medium, glauconitic, partially indurated.

149-168 Siltstone, gray, clayey, slightly indurated.

168-201 Sandstone, greenish-gray, very fine to fine, moderately indurated.

201-222 Siltstone, light-gray, sandy, slightly micaceous, brittle.

222-308 Siltstone, medium-dark-gray, clayey, partially indurated.

PIERRE SHALE

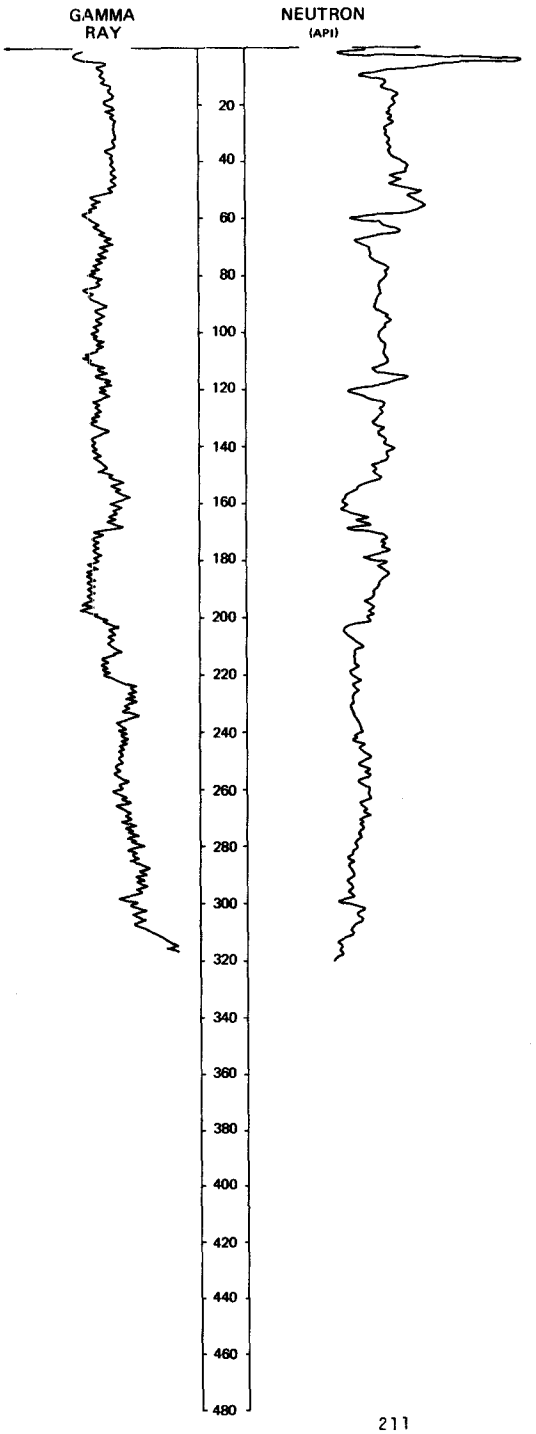
308-320 Shale, grayish-black, siliceous, brittle, moderately indurated.

LOCATION: 154-075-21CDD1, 2

DATE DRILLED: 9/24/76

ALTITUDE: 1550
(FT, NGVD)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

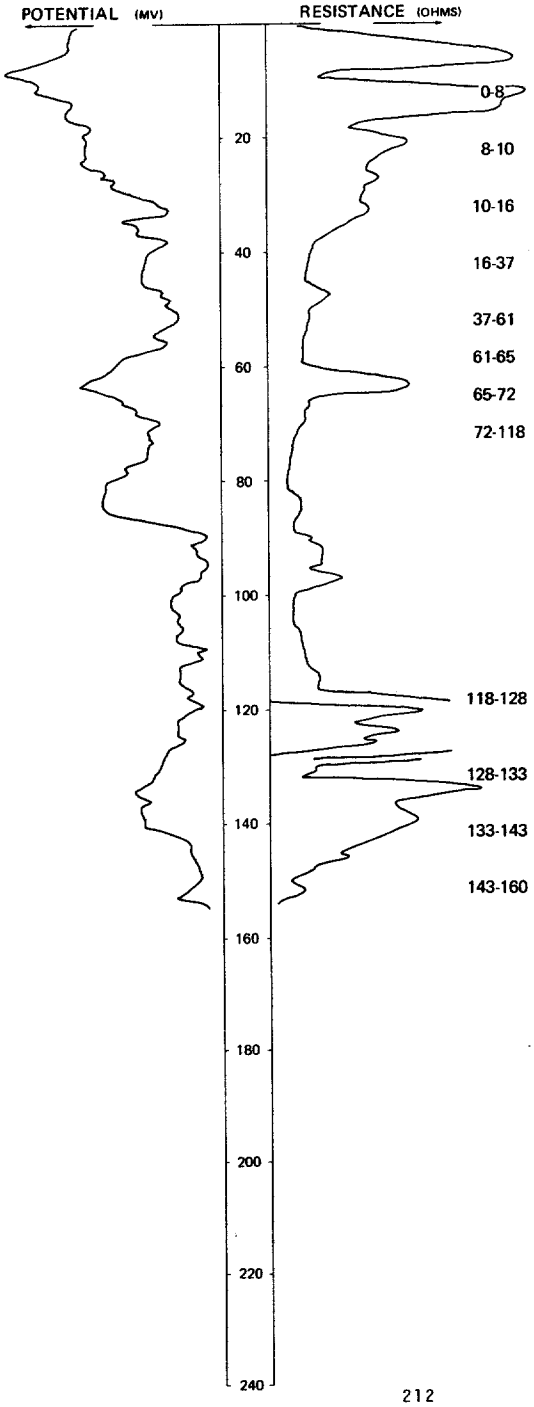
NDSWC 10180

LOCATION: 154-075-23DDA

DATE DRILLED: 8/08/78

ALTITUDE: (FT, NGVD) 1540

DEPTH: (FT) 160



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Sand, very fine to fine, predominantly fine, oxidized.
8-10	Clay, brownish-black, very silty, carbonaceous.
10-16	Sand, very fine to coarse, predominantly fine.
16-37	Clay, medium-gray, very silty, sandy.
37-61	Till, dark-gray, silty, sandy.
61-65	Sand, fine to medium, silty.
65-72	Till, dark-gray, sandy.
72-118	Till, dark-gray, silty, sandy; some carbonaceous streaks.
118-128	Sand, fine to medium, gravelly.

HELL CREEK FORMATION

128-133	Siltstone, dark-gray, clayey, partially indurated.
133-143	Sandstone, greenish-gray, very fine to fine, moderately indurated.
143-160	Siltstone, dark-gray, clayey, slightly indurated; carbonaceous streaks.

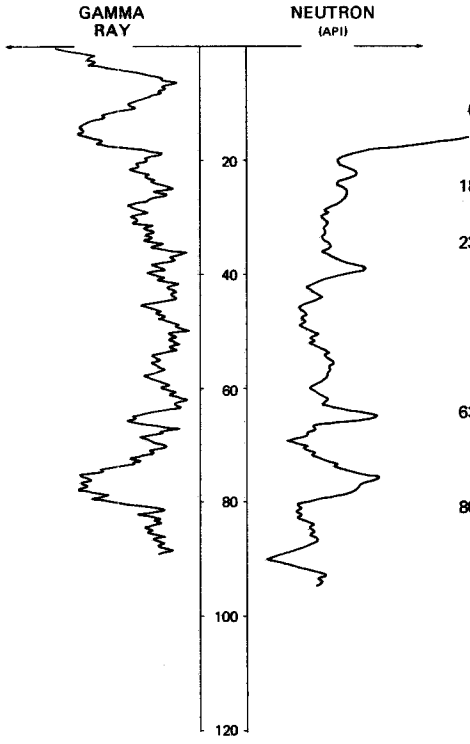
NDSWC 4994

LOCATION: 154-075-30DDD

DATE DRILLED: 9/27/76

ALTITUDE: 1550
(FT, NGVD)

DEPTH: 100
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-18	Sand, fine to very coarse; about 20 percent fine to medium gravel; subangular to rounded; oxidized.
18-23	Till, yellowish-brown, silty, gravelly, oxidized.
23-63	Clay, medium-gray, silty, sandy.
63-80	Gravel, fine to coarse, sandy, subangular to rounded.

FOX HILLS SANDSTONE

80-100	Sandstone, greenish-gray, very fine to fine, clayey, glauconitic, moderately indurated.

154-076-04CCC
NDSWC 10028

Altitude: 1505 feet

Date drilled: 10/27/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, very fine to fine, subangular to rounded, partially oxidized	39	40
	Till, dark-gray, silty	25	65
	Clay, dark-gray, silty, sandy	9	74
Fox Hills Sandstone:			
	Sandstone, greenish-gray, very fine to medium, glauconitic	21	95
	Shale, medium-brown, clayey, carbonaceous	5	100

154-076-05DAA
(Log modified from North Dakota Geological Survey)

Altitude:	1507 feet	Date drilled:	7/16/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand, coarse	4	4
	Sand, black, loamy; soil zone	2	6
	Sand, medium-coarse; snails	2	8
	Clay, sandy, very calcareous, white; marl	1	9
	Sand, medium to coarse, wet; brown water	2	11
	Sand, coarse to very coarse, gray, wet; excellent aquifer	3	14
	Sand, coarse to very coarse, gray, wet	5	19
	Sand, coarse to very coarse, gray, wet; more gravel and coarser than sand from 14 to 19 feet	5	24
	Sand, very coarse, fairly pebbly; some 1-inch to 2-inch lignite pebbles	5	29
	Sand, very coarse, fairly pebbly; abundant lignite pebbles	5	34
	Sand, coarse to very coarse; finer than sand from 29 to 34 feet; fewer pebbles	5	39
	Till(?)	5	44

154-076-16CCC
NDSWC 10027

Altitude:	1517 feet	Date drilled:	10/27/77
Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, fine, uniform, rounded, oxidized	4	5
	Sand, very fine to medium, rounded; occasional lenses of clayey silt	33	38
	Silt, dark-gray, very clayey	42	80
Fox Hills Sandstone:			
	Shale, brownish-gray, carbonaceous; variegated grays	20	100

154-076-21CCC
NDSWC 9548

Altitude:	1526 feet	Date drilled:	5/12/76
Glacial drift:			
	Sand, fine to very coarse, subangular to rounded; oxidized to about 17 feet; abundant detrital lignite below 30 feet	42	42
	Till, dark-gray, gravelly; cobbles and boulders	20	62
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine to medium, clayey, indurated	3	65
	Shale, brownish-gray, silty; interbedded with thin lenses of fine clayey indurated sandstone	15	80

154-076-30AAA
NDSWC 9547

Altitude:	1530 feet	Date drilled:	5/12/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to coarse, predominantly medium, subrounded to rounded; oxidized to about 20 feet; abundant detrital lignite	27	27
	Till, dark-olive-gray, sandy, gravelly	32	59
	Sand, fine to medium, subrounded	5	64
	Till, dark-gray, sandy, gravelly	27	91
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine to medium, clayey, macerated; carbonaceous streaks	10	101
	Sandstone, greenish-gray to brownish-gray, fine to medium; interbedded with thin lenses of carbonaceous shale	19	120

154-076-30CBB
NDSWC 9546

Altitude:	1530 feet	Date drilled:	5/12/76
Glacial drift:			
	Sand, fine to coarse, subangular to subrounded; oxidized to about 12 feet	21	21
	Till, dark-olive-gray, sandy, gravelly	22	43
Fox Hills Sandstone:			
	Shale, brownish-gray, silty, slightly carbonaceous; interbedded with lenses of greenish-gray fine sandstone	37	80

154-076-31BCC
NDSWC 9394

Altitude:	1535 feet	Date drilled:	8/07/75
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse; about 30 percent fine to medium gravel; angular to subrounded; oxidized to 7 feet	11	11
	Till, dark-gray, sandy; some thin lenses of gravel	31	42
Fox Hills Sandstone:			
	Shale, greenish-gray to brownish-gray, silty, sandy, fissile, moderately indurated; carbonaceous streaks	18	60

154-076-33CCC
NDSWC 5851

Altitude: 1535 feet — Date drilled: 10/01/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, fine to very coarse, gravelly, angular to subrounded	26	27
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine, micaceous, calcareous, indurated	4	31
	Shale, medium-bluish-gray, silty, sandy, moderately indurated	29	60

154-077-02CCC
NDSWC 9543

Altitude: 1500 feet — Date drilled: 5/11/76

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, gravelly, angular to subrounded; abundant detrital lignite	24	24
	Till, dark-olive-gray, sandy, gravelly	39	63
Fox Hills Sandstone:			
	Shale, grayish-brown, carbonaceous	8	71
	Sandstone, greenish-gray, fine to medium, clayey, glauconitic, micaceous	9	80

154-077-03ABC
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 8/18/76

Sandy loam	1	1
Fine sand	10	11
Yellow till	9	20
Medium gravel	20	40
Gray clay	32	72
White clay	28	100

154-077-03ABD
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 8/18/76

Sandy loam	1	1
Fine sand	10	11
Yellow till	9	20
Medium gravel	20	40
Gray clay	1	41

154-077-06DCB
(Log modified from Nick Erck Well Drilling)

Date drilled: 12/18/72

Black topsoil	1	1
Yellow clay	23	24
Blue clay	14	38
Blue sand	15	53

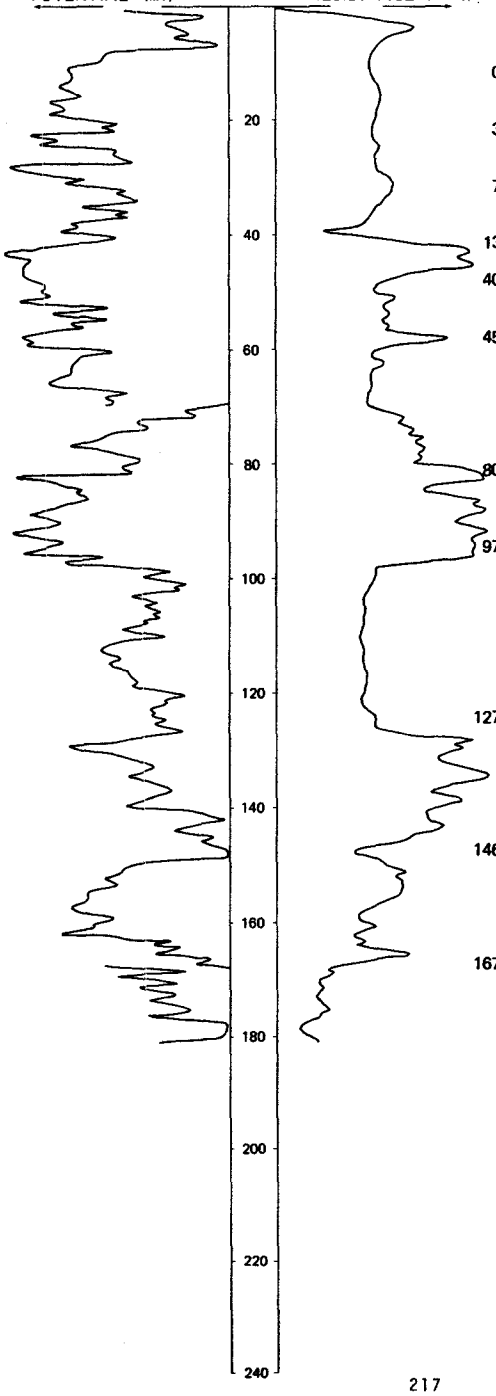
NDSWC 9553

LOCATION: 154-077-07DDD

DATE DRILLED: 5/17/76

ALTITUDE: 1615
(FT, NGVD)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-3	Sand, yellowish-brown, clayey, silty, oxidized.
3-7	Till, yellowish-brown, silty, sandy, oxidized.
7-13	Till, yellowish-brown, sandy, gravelly, oxidized.
13-40	Till, olive-gray, sandy, gravelly.
40-45	Sand, medium to coarse, subangular to rounded.
45-80	Till, olive-gray, sandy; gravelly from 71 to 80 feet.
80-97	Sand, medium to coarse, predominantly coarse, subangular to rounded.
97-127	Till, olive-gray, sandy.
127-146	Sand, fine to medium, clayey; reworked bedrock.

HELL CREEK FORMATION

146-167	Sandstone, greenish-gray, fine, glauconitic, slightly indurated.
167-180	Sandstone, greenish-gray, fine, very clayey, moderately indurated.

154-077-12CCD
NDSWC 5304

Altitude: 1500 feet — Date drilled: 5/22/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, predominantly coarse, gravelly, subrounded; oxidized to 13 feet	17	17
	Gravel, fine to medium, sandy, subrounded	7	24
	Till, dark-gray, silty, sandy	6	30
	Sand, fine to coarse, gravelly, clayey	5	35
	Boulders	1	36
	Clay, dark-brown; about 40 percent silt; carbonaceous	6	42
Fox Hills Sandstone:			
	Shale, dark-brown, fissile, slightly indurated; interbedded with fine sandstone; carbonaceous streaks	18	60

154-077-15DDD
NDSWC 9542

Altitude: 1535 feet — Date drilled: 5/11/76

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, subangular to subrounded; oxidized to 10 feet	24	24
	Till, dark-gray, sandy, gravelly	27	51
Hell Creek Formation:			
	Shale, brownish-gray, carbonaceous; interbedded with greenish-gray fine to medium moderately indurated sandstone	29	80

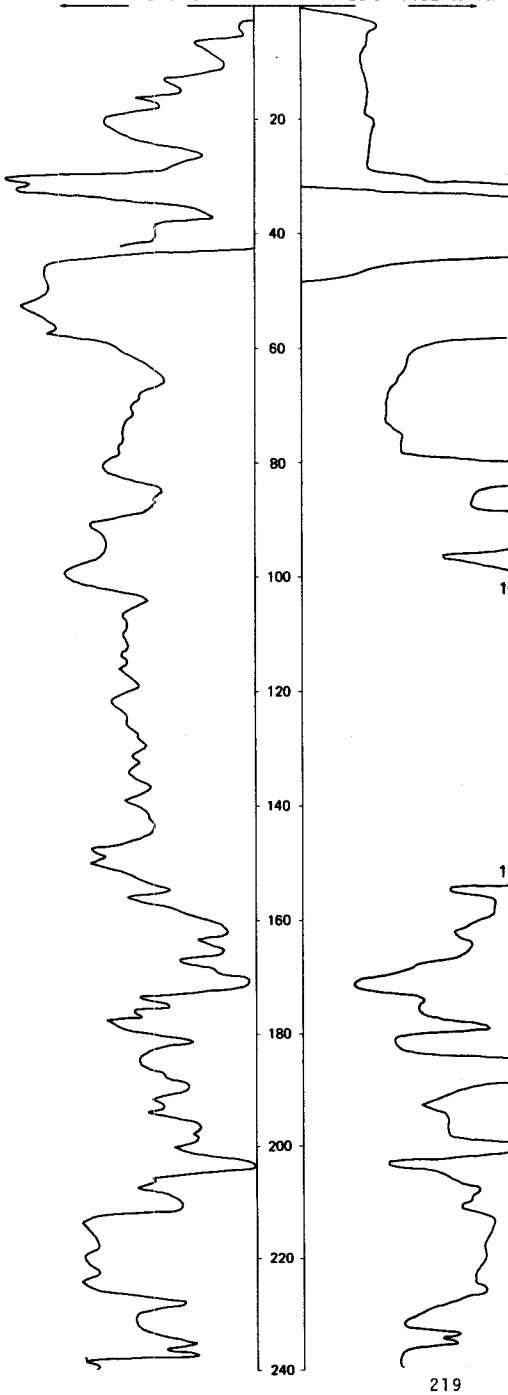
NDSWC 9552

LOCATION: 154-077-17CCC

DATE DRILLED: 5/17/76

ALTITUDE: 1585
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-30 Till, yellowish-brown, sandy, oxidized.

30-58 Sand, very fine to fine, subrounded.

58-80 Till, olive-gray, sandy, gravelly.

80-100 Till, olive-gray, gravelly; with lenses of fine sand.

100-154 Sand, fine to coarse; about 30 percent medium gravel; subangular to rounded.

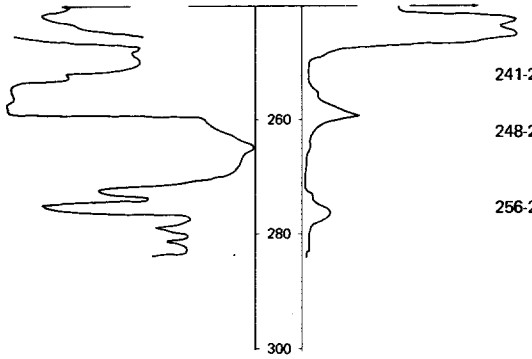
154-241 Sand, fine to coarse; about 30 percent fine to medium gravel; silty clay lenses at 164, 204, 230, and 240 feet.

LOCATION: 154-077-17CCC

DATE DRILLED: 5/17/76

ALTITUDE: 1585
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE

241-248	Shale, grayish-brown, carbonaceous, moderately indurated.
248-256	Sandstone, greenish-gray, fine, slightly indurated; carbonaceous streaks.
256-280	Shale, grayish-brown, moderately carbonaceous; interbedded with gray fine sandstone.

154-077-18CCC
NDSWC 9554

Altitude: 1575 feet

Date drilled: 5/18/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Till, yellowish-brown, sandy, gravelly, oxidized	31	31
	Clay, olive-gray, silty, sandy	22	53
	Sand, very fine to fine, subrounded; detrital lignite	12	65
	Sand, medium to coarse, predominantly coarse, well-rounded	10	75
	Till, dark-gray, sandy, gravelly; numerous thin lenses of sand and gravel from 130 to 167 feet	92	167
	Gravel, fine to coarse, subangular to rounded	22	189
	Sand, fine to coarse, silty, clayey; interbedded with lenses of fine to coarse subrounded gravel	33	222
Fox Hills Sandstone:			
	Sandstone, greenish-gray, very fine to fine, glauconitic, slightly indurated	38	260

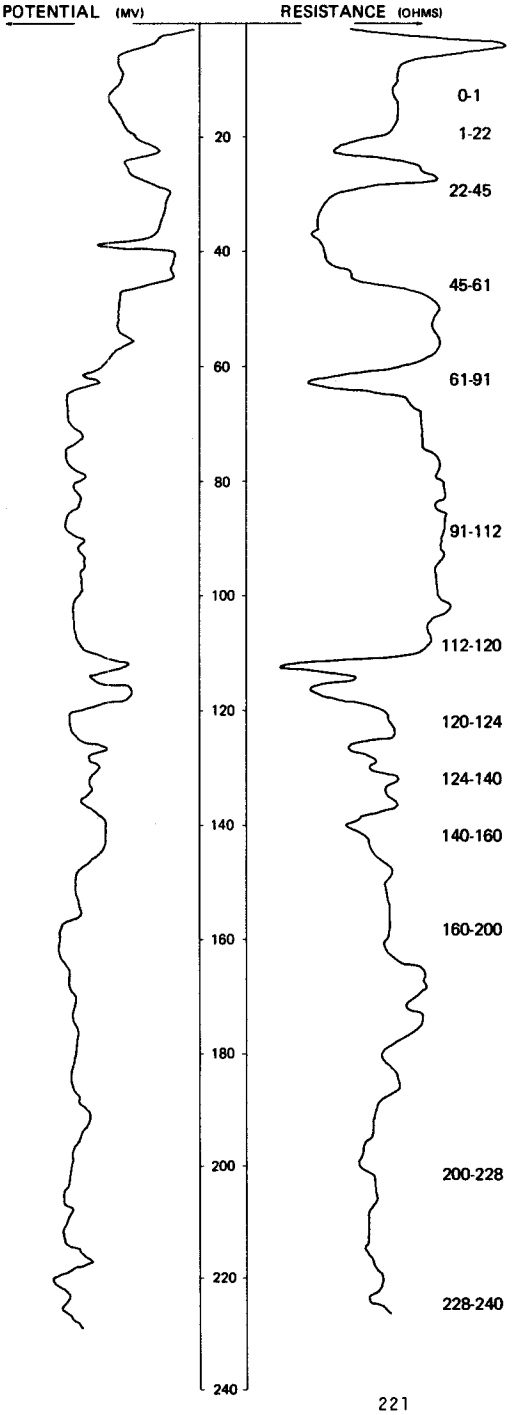
NDSWC 10364

LOCATION: 154-077-21DCC

DATE DRILLED: 11/01/78

ALTITUDE: (FT, NGVD) 1535

DEPTH: (FT) 240



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-22	Sand, very fine to coarse, subangular, oxidized.
22-45	Till, olive-gray, sandy, gravelly.
45-61	Sand, fine to coarse; about 30 percent fine to medium gravel; subangular to rounded; abundant detrital lignite.
61-91	Sand, medium to coarse; about 30 percent fine gravel.
91-112	Sand, fine, gravelly, subangular to well-rounded.
112-120	Silt, dark-gray, sandy.
120-124	Sand, fine, gravelly, subangular to subrounded.
124-140	Sand, very fine to coarse, silty.
140-160	Sand, fine to very coarse; about 20 percent fine gravel; abundant detrital lignite.
160-200	Sand, coarse to very coarse; about 30 percent fine gravel; poorly sorted.
200-228	Gravel, fine to coarse; about 30 percent coarse sand; subangular to rounded.

FOX HILLS SANDSTONE

228-240	Sandstone, greenish-gray, very fine to fine, silty, clayey, poorly indurated.

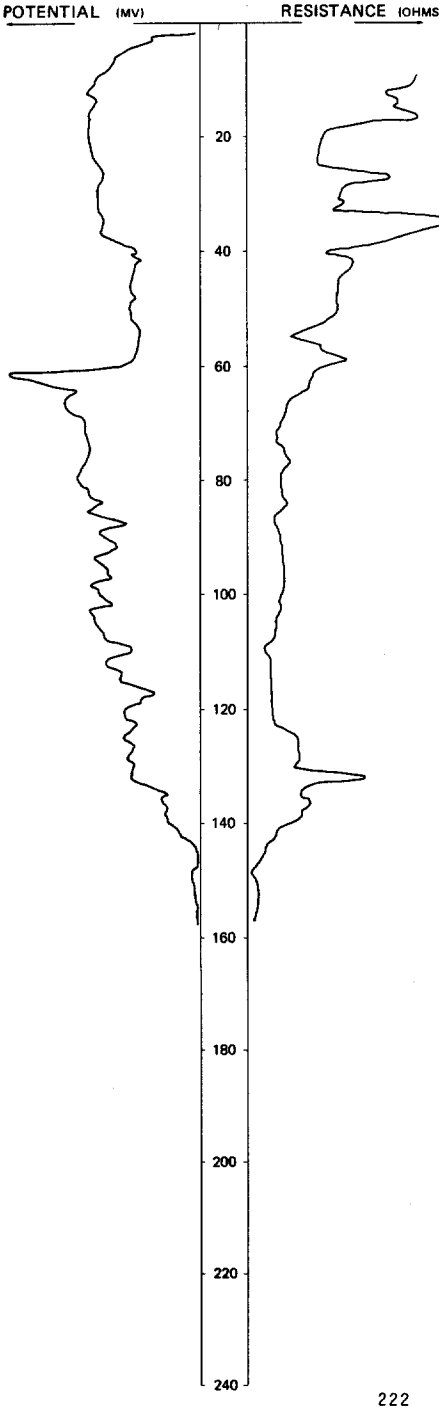
NDSWC 10362

LOCATION: 154-077-22CBC

DATE DRILLED: 11/01/78

ALTITUDE: 1540 (FT, NGVD)

DEPTH: 160 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-20	Sand, very fine to very coarse, predominantly coarse, oxidized.
20-34	Clay, olive-gray, silty, sandy.
34-39	Sand, very fine to medium, silty.
39-60	Till, olive-gray, very sandy.
60-117	Till, olive-gray, silty.
117-130	Till, olive-gray, sandy.
130-133	Cobbles and boulders.
133-136	Till, olive-gray, gravelly.

FOX HILLS SANDSTONE

136-142	Sandstone, greenish-gray, very fine to medium, moderately indurated.
142-160	Sandstone, greenish-gray, very fine to fine, clayey, moderately indurated.

154-077-22CCC
NDSWC 10363

Altitude:	1535 feet	Date drilled:	11/01/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, yellowish-brown, fine to very coarse, predominantly coarse, oxidized	17	18
	Till, olive-gray, very sandy, gravelly	8	26
	Till, olive-gray, sandy; with lenses of coarse gravel	7	33
	Till, olive-gray, very silty, slightly sandy	69	102
	Sand, greenish-gray, fine; interbedded with carbonaceous clay; shove block	35	137
	Till, olive-gray, very silty	6	143
	Clay, dark-gray	60	203
	Sand, medium to coarse; about 40 percent medium gravel; subangular to well rounded	21	224
	Gravel, fine to coarse, clayey, subangular to rounded	5	229
	Gravel, fine to very coarse; about 30 percent medium to coarse sand; cobbles and boulders	21	250

154-077-25CDB
NDSWC 9545

Altitude:	1540 feet	Date drilled:	5/12/76
Glacial drift:			
	Sand, fine to coarse, predominantly coarse, subangular to subrounded; oxidized to about 10 feet	23	23
	Boulders, sandstone	1	24
	Till, dark-olive-gray, sandy, gravelly	33	57
Hell Creek Formation:			
	Shale, brownish-gray, carbonaceous, fissile	19	76
	Shale, brownish-gray, carbonaceous; interbedded with lenses of greenish-gray partially indurated sandstone	8	84
	Siltstone, greenish-gray; interbedded with greenish-gray very fine indurated sandstone	16	100

154-077-26DAD
NDSWC 9544

Altitude:	1540 feet	Date drilled:	5/12/76
Glacial drift:			
	Sand, fine to coarse, predominantly coarse, subangular to subrounded; oxidized to about 8 feet	10	10
	Till, dark-olive-gray, sandy, gravelly	22	32
Hell Creek Formation:			
	Shale, dark-brownish-gray, carbonaceous; interbedded with thin lenses of greenish-gray very fine sandstone	45	77
	Siltstone, greenish-gray, clayey; interbedded with lenses of grayish-green fine sandstone; carbonaceous streaks	23	100

154-077-27ADD
NDSWC 9538

Altitude:	1535 feet	Date drilled:	5/07/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly very coarse; about 15 percent medium gravel; angular to subrounded; oxidized	13	13
	Till, dark-olive-gray, very sandy	29	42
	Clay, dark-gray, silty; sand lenses at 44 and 58 feet	32	74
	Sand, very fine to coarse, silty, subrounded to rounded	18	92
	Sand, very fine to coarse; about 40 percent fine to very coarse gravel; boulders	10	102
Hell Creek Formation:			
	Shale, brownish-gray, carbonaceous; interbedded with greenish-gray very fine to fine moderately indurated sandstone	18	120

154-077-27CDD
NDSWC 9390

Altitude:	1533 feet	Date drilled:	8/06/75
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, angular to subrounded, oxidized	9	9
	Till, yellowish-brown, sandy, gravelly, oxidized	3	12
	Till, dark-gray, sandy, gravelly	4	16
	Sand, fine to coarse, predominantly medium, subrounded to rounded	4	20
	Clay, medium-gray, silty; fossil fragments	83	103
	Sand, fine to very coarse; about 20 percent fine to medium gravel; angular to subrounded; abundant detrital lignite	87	190
	Gravel, fine to medium; about 40 percent fine to very coarse sand; subangular to rounded	10	200
	Gravel, fine to very coarse, sandy, angular to subrounded; cobbles	23	223
Fox Hills Sandstone:			
	Shale, light-gray to greenish-gray, silty; interbedded with greenish-gray fine to medium silty moderately indurated sandstone	17	240

154-077-27DBB
NDSWC 9539

Altitude: 1520 feet — Date drilled: 5/10/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to very coarse, subangular to rounded, oxidized	6	6
	Till, yellowish-brown, sandy, gravelly	8	14
	Till, dark-olive-gray, sandy, gravelly	9	23
	Gravel, fine to coarse; about 10 percent fine to very coarse sand; angular to subrounded	5	28
	Clay, medium-dark-gray, silty, sandy; occasional thin lenses of gravel	38	66
	Till, dark-olive-gray, sandy, gravelly	70	136
	Clay, medium-dark-gray, silty	12	148
	Till, dark-gray, silty, sandy	21	169
	Sand, very fine to coarse, silty; interbedded with thin lenses of silty clay	50	219
	Cobbles and boulders	4	223
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine to medium, clayey, moderately indurated	17	240

154-077-28AAC
(Log modified from Verne R. Peterson Well Drilling)

Date drilled: 7/16/76

Sand; gravel	16	16
Shale	6	22
Gravel	16	38
Shale	10	48
Sand	8	56
Sandy till	20	76
Gravelly till	20	96
Coal chips; sand	18	114
Dirty sand	46	160
Gravel; becoming coarser and cleaner at bottom	63	223
Bedrock	1	224

154-077-28ACC
NDSWC 9541

Altitude: 1540 feet — Date drilled: 5/11/76

Sand, fine to coarse, predominantly medium, subangular to rounded; oxidized to 12 feet	16	16
Till, dark-olive-gray, silty, very sandy	22	38
Till, dark-gray, sandy; lenses of sand from 42 to 45 and 47 to 49 feet	18	56
Sand, very fine to medium, subrounded to rounded; abundant detrital lignite	36	92
Sand, fine to very coarse, predominantly coarse, subangular to subrounded; gravelly below 100 feet	48	140
Sand, fine to very coarse, predominantly coarse; about 40 percent fine to medium gravel; subangular to rounded; abundant detrital lignite	81	221
Fox Hills Sandstone:		
Sandstone, grayish-green, fine to medium, clayey, moderately indurated; thin limestone lenses	19	240

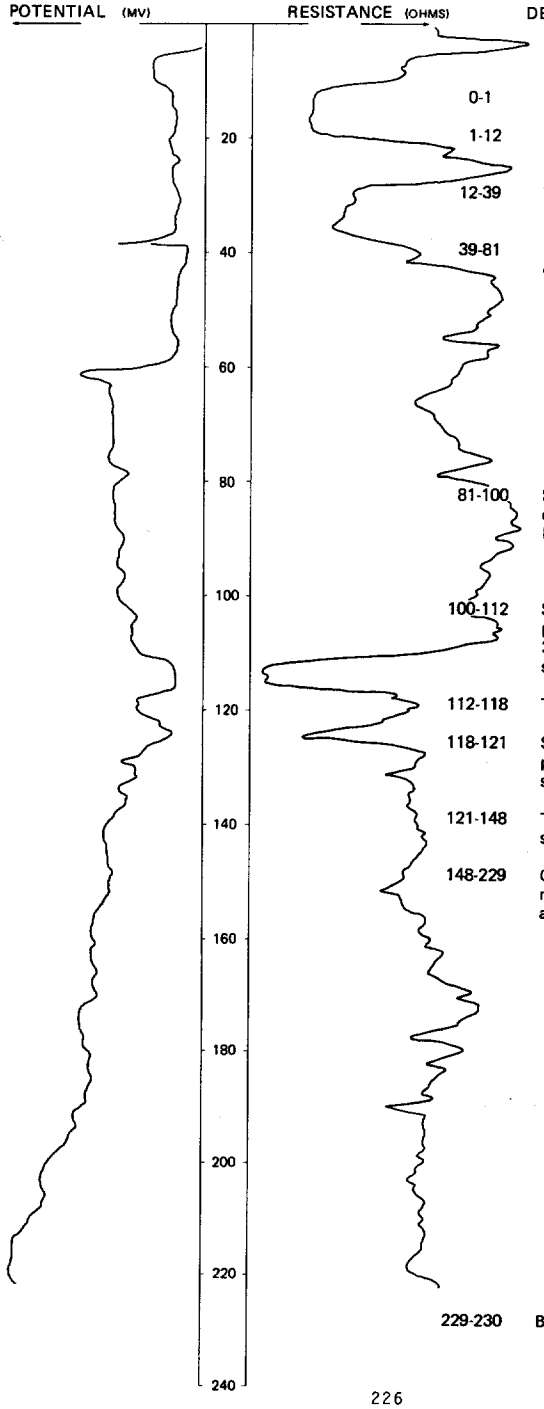
NDSWC 10365

LOCATION: 154-077-28ADB1

DATE DRILLED: 11/02/78

ALTITUDE: (FT, NGVD) 1540

DEPTH: (FT) 230



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-12	Sand, very fine to very coarse, gravelly, oxidized.
12-39	Till, olive-gray, sandy; gravelly from 14 to 39 feet.
39-81	Sand, very fine to medium, predominantly fine; occasional thin lenses of detrital lignite.
81-100	Sand, fine to very coarse, predominantly coarse; some detrital lignite.
100-112	Sand, medium to very coarse, predominantly very coarse; about 30 percent fine to medium gravel; subangular to rounded.
112-118	Till, olive-gray, sandy, gravelly.
118-121	Sand, fine to coarse; about 30 percent fine to medium gravel; subangular to well rounded.
121-148	Till, olive-gray; interbedded with sand and gravel.
148-229	Gravel, medium; about 30 percent medium to very coarse sand; angular to well rounded.
229-230	Boulder.

154-077-28ADB2
NDSWC 10367

Altitude: 1540 feet

Date drilled: 11/02/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, very fine to coarse, gravelly, oxidized	11	12
	Till, olive-gray, silty, sandy; medium sand from 27 to 30 feet	34	46
	Sand, very fine to coarse; with thin lenses of silty clay	12	58
	Gravel, fine; about 30 percent medium sand; clayey	27	85
	Gravel, fine; about 40 percent medium to coarse sand; subangular to rounded	28	113
	Till, olive-gray, silty, sandy	12	125
	Gravel, fine to coarse; about 20 percent coarse sand; subangular to rounded; abundant detrital lignite	12	137
	Gravel, fine to coarse; about 20 percent coarse sand; clayey; subangular to rounded	16	153
	Till, olive-gray, very sandy, gravelly	4	157
	Gravel, medium; about 30 percent medium to very coarse sand; subangular to rounded; detrital lignite from 170 to 172 feet	63	220

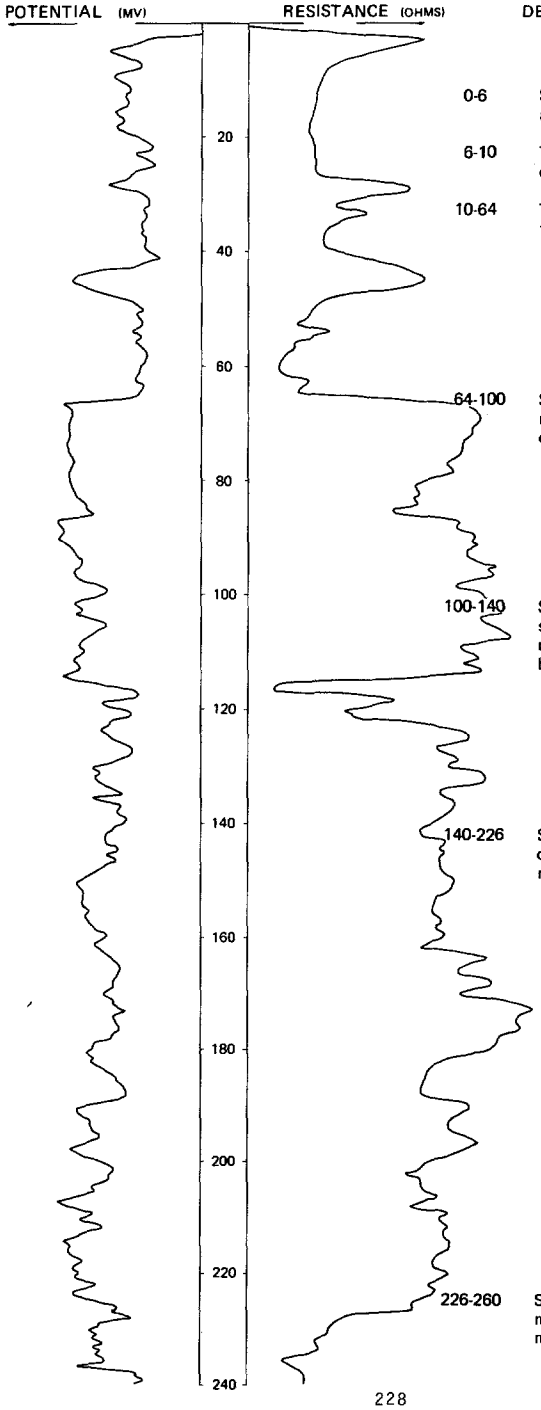
NDSWC 9540

LOCATION: 154-077-28ADD1

DATE DRILLED: 5/11/76

ALTITUDE: (FT, NGVD) 1539

DEPTH: (FT) 260



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-6 Sand, fine to very coarse, subangular to rounded, oxidized.

6-10 Till, yellowish-brown, sandy, oxidized.

10-64 Till, dark-olive-gray, medium sand from 27 to 30 and 42 to 46 feet.

64-100 Sand, very fine to medium, subrounded to rounded; abundant detrital lignite.

100-140 Sand, fine to very coarse, gravelly; sandy clay from 113 to 116 feet; more gravelly and detrital lignite below 120 feet.

140-226 Sand, fine to very coarse, predominantly coarse, subangular to rounded; abundant detrital lignite.

FOX HILLS SANDSTONE

226-260 Sandstone, greenish-gray, fine to medium, clayey, micaceous, moderately indurated.

NDSWC 9540, Continued

LOCATION: 154-077-28ADD1

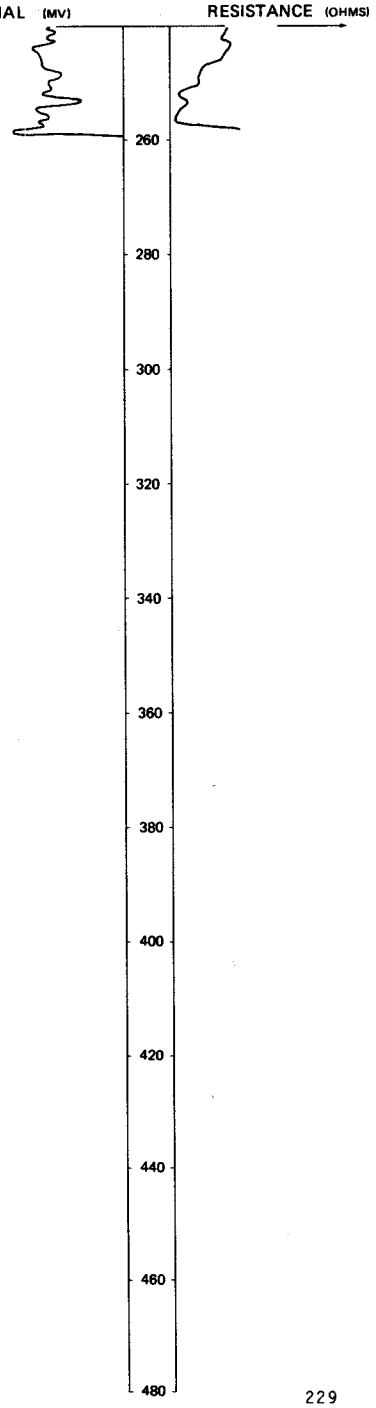
DATE DRILLED: 5/11/76

ALTITUDE: (FT, NGVD) 1539

DEPTH: (FT) 260

POTENTIAL (MV) ← RESISTANCE (OHMS) →

DESCRIPTION OF DEPOSITS



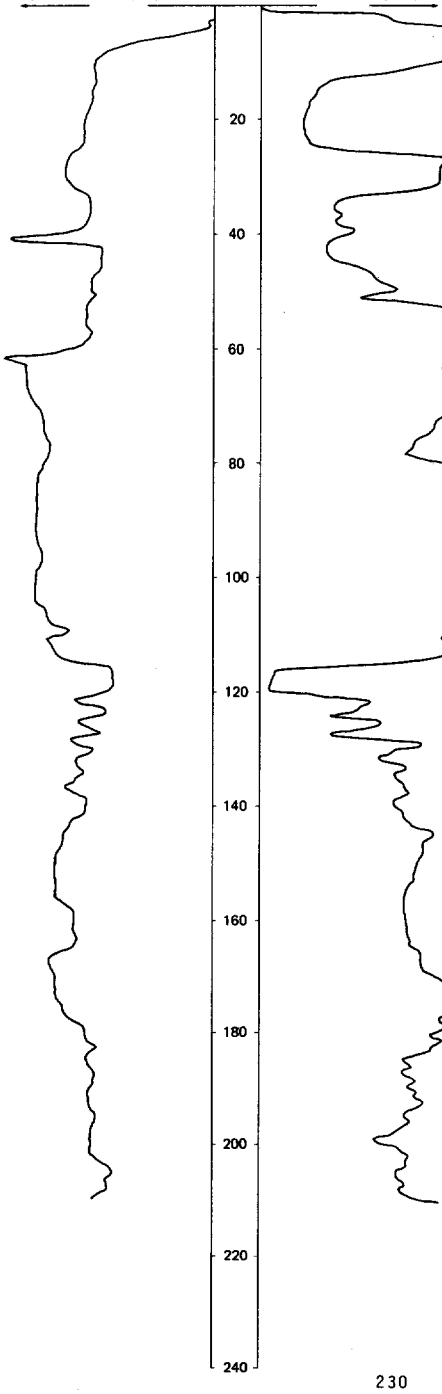
NDSWC 10366

LOCATION: 154-077-28ADD2

DATE DRILLED: 11/02/78

ALTITUDE: (FT, NGVD) 1540

DEPTH: (FT) 240



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black, sandy.
1-12	Sand, fine to coarse, predominantly coarse, oxidized.
12-53	Till, olive-gray, very sandy; gravelly from 24 to 32 feet.
53-76	Sand, very fine to medium; abundant detrital lignite.
76-81	Till, olive-gray, sandy.
81-114	Sand, fine to very coarse, predominantly very coarse.
114-124	Till, olive-gray, silty, sandy.
124-143	Sand, fine to medium; about 20 percent very coarse gravel; clayey; subangular to rounded.
143-160	Gravel, medium to coarse; about 30 percent medium to very coarse sand; subangular to rounded.
160-240	Gravel, fine to coarse, predominantly medium; about 30 percent coarse sand; angular to rounded; interbedded thin lenses of detrital lignite.

154-077-29ADA
NDSWC 10368

Altitude: 1545 feet — Date drilled: 11/02/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, very fine to coarse, predominantly coarse, oxidized	13	14
	Till, olive-gray, silty, sandy	20	34
	Sand, fine to coarse, gravelly, subrounded	3	37
	Till, olive-gray, sandy	9	46
	Sand, very fine to coarse, predominantly fine, subrounded	11	57
	Clay, dark-gray, sandy; detrital lignite	8	65
	Sand, very fine to medium, predominantly fine; abundant detrital lignite	57	122
	Sand, very fine to very coarse, predominantly coarse, subangular to rounded, poorly sorted	18	140
	Sand, coarse; about 30 percent fine gravel; interbedded lenses of detrital lignite and sandy clay	22	162
	Sand, fine to very coarse, predominantly coarse; about 20 percent fine gravel; subangular to rounded	18	180
	Gravel, medium; about 30 percent medium to very coarse sand; abundant detrital lignite	26	206
	Boulders	2	208

154-077-29BBB
NDSWC 9551

Altitude: 1548 feet — Date drilled: 5/13/76

Glacial drift:			
	Sand, fine to coarse, subangular to subrounded; oxidized to about 14 feet	33	33
	Till, dark-olive-gray, sandy, gravelly	33	66
	Sand, very fine to coarse, subrounded to rounded	41	107
	Sand, fine to coarse, subrounded to rounded; some detrital lignite	16	123
	Sand, fine to coarse; about 20 percent fine to medium gravel; subrounded; abundant detrital lignite	17	140
	Sand, fine to coarse, gravelly; some lenses of silty clay	44	184
	Sand, fine to coarse, gravelly, subrounded to rounded; abundant detrital lignite	45	229
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine to medium, clayey, moderately indurated; some carbonaceous streaks	4	233
	Shale, brownish-gray, silty, fissile, slightly indurated	27	260

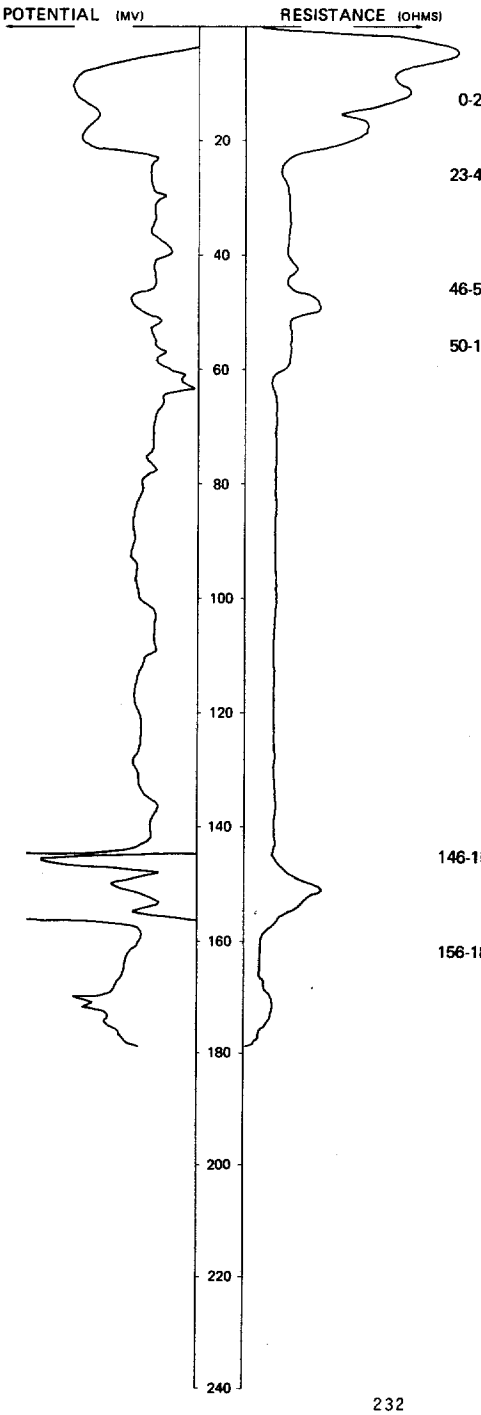
NDSWC 9388

LOCATION: 154-077-29CCC

DATE DRILLED: 8/06/75

ALTITUDE: (FT, NGVD) 1540

DEPTH: (FT) 180



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-23	Sand, fine to very coarse, predominantly coarse, angular to subrounded, oxidized.
23-46	Till, dark-gray, sandy, gravelly.
46-50	Gravel, fine to medium, angular to subrounded.
50-146	Till, dark-gray, silty.
146-156	Gravel, fine to medium, sandy, angular to subrounded.

HELL CREEK FORMATION

156-180	Shale, brownish-gray to brownish-black, carbonaceous, fissile, partially indurated; becoming bentonitic at 170 feet.

154-077-30ADD
NDSWC 9550

Altitude:	1545 feet	Date drilled:	5/13/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, angular to subrounded; oxidized to about 10 feet	37	37
	Till, dark-olive-gray, sandy; with thin lenses of gravel at 46, 58, and 88 feet	54	91
Hell Creek Formation:			
	Shale, brownish-gray, carbonaceous, fissile; interbedded with thin lenses of greenish-gray fine clayey sandstone; with carbonaceous streaks	29	120

154-077-30CAC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1551 feet	Date drilled:	10/09/74
Glacial drift:			
	Sand, coarse to very coarse, oxidized	31	31
	Sand, very fine to coarse	32	63

154-077-30CBB
(Log modified from U.S. Bureau of Reclamation)

		Date drilled:	4/14/71
Glacial drift:			
	Sand, fine to coarse, oxidized	30	30
	Sand, fine to coarse	46	76
	Silt, dark-gray, clayey	2	78

154-077-30CBC
(Log modified from Empire Irrigation & Drilling Co., Inc.)

		Date drilled:	6/19/69
	Brown sand	10	10
	Fine gravel	24	34
	Gray fine to medium sand; with lignite	102	136
	Fine to coarse sand	6	142
	Medium gravel	18	160
	Coarse gravel	20	180

154-077-30CDA
(Log modified from Farmers Supply Company)

		Date drilled:	10/16/74
	Top sand	3	3
	Coarse sand and gravel	13	16
	Coarse sand and fine gravel	18	34
	Gray sand; with lignite	78	112
	Coarse sand and fine gravel	18	130
	Gray very hard clay	4	134

154-077-30CDB1
(Log modified from Farmers Supply Company)

Date drilled: 7/ /74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Brown sand	10	10
	Fine gravel and sand	24	34
	Gray fine to medium sand; with lignite	102	136
	Fine to coarse sand	6	142
	Medium gravel	18	160
	Coarse gravel	2	162

154-077-30CDB2
(Log modified from Verne R. Peterson Well Drilling)

Date drilled: 4/11/77

	Topsoil; sand	2	2
	Medium to coarse sand	18	20
	Medium sand	38	58
	Fine lignitic sand	82	140
	Gray till	4	144
	Fine gray lignitic sand	27	171
	Gravel	9	180
	Coarse gravel	23	203

154-077-30CDD
(Log from Farmers Supply Company)

Date drilled: 10/16/74

	Topsoil	4	4
	Coarse sand	9	13
	Medium and coarse sand	51	64
	Coarse sand and gravel	26	90
	Gray clay till; with sand layers	52	142
	Gray clay; with gravel streaks; about one-third clay	34	176
	Very hard clay	4	180

154-077-30DAC1
(Log from Farmers Supply Company)

Date drilled: 10/17/74

	Topsoil	3	3
	Coarse sand	9	12
	Medium gravel, coarse sand, and lignite	46	58

154-077-30DAC2
(Log modified from Verne R. Peterson Well Drilling)

Date drilled: 10/18/76

	Mixed sand and gravel	10	10
	Small layer of clay	1	11
	Gray coarse sand	14	25
	Coarse gravel; with sand and lignite chips	29	54
	Shale	2	56

154-077-30DBD
NDSWC T-1

Date drilled: 2/19/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, fine to very coarse, gravelly	16	18
	Gravel, fine to coarse, sandy	4	22
	Sand, fine to very coarse, gravelly	13	35
	Sand, medium to very coarse, gravelly; fine lignitic chips	15	50
	Sand, fine to coarse, gravelly; with lignite and clay lenses	9	59
	Interbedded very fine sand and silt to silty clay	31	90
	Gravel, fine to very coarse, sandy	1	91
	Till, medium-dark-gray, silty	22	113
	Gravel, medium	1	114
Fox Hills Sandstone:			
	Sandstone, very fine to medium, indurated	2	116
	Shale, brown, carbonaceous	4	120

154-077-30DCA
(Log from Farmers Supply Company)

Date drilled: 10/10/74

	Topsoil	3	3
	Coarse sand	9	12
	Medium gravel and coarse sand; some coal	48	60
	Gray clay	1	61
	Coarse sand and gravel	18	79
	Gray sand and clay till	49	128
	Gray hard clay	14	142

154-077-30DCB1
(Log from Farmers Supply Company)

Date drilled: 10/10/74

	Topsoil	3	3
	Coarse sand; with some gravel	128	131
	Gray clay till	40	171
	Gray clay; hard shale	8	179

154-077-30DCB2
NDSWC T-2

Date drilled: 2/19/77

Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Sand, medium to very coarse, mostly coarse	19	21
	Sand, fine to very coarse, gravelly	20	41
	Sand, fine to medium; some very coarse; lignite chips	33	74
	Sand, very fine to coarse; interbedded with silt and clay	20	94
	Till, medium-gray, silty to sandy	17	111
Fox Hills Sandstone:			
	Shale, brownish-gray; with siltstone	9	120

154-077-30DCC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1548 feet	Date drilled:	8/27/71
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil, black, sandy	2	2
	Sand, brown, oxidized; about 75 percent coarse to predominantly medium to fine sand and 5 percent fine gravel from 2 to 20 feet; about 95 percent coarse to predominantly medium to fine sand and 5 percent fines with occasional gravel from 20 to 42 feet; about 90 percent predominantly fine sand and 10 percent fines from 42 to 48 feet; about 95 percent coarse to predominantly medium to fine sand and 5 percent fines with lignite slack concentrations from 48 to 56 feet; about 80 to 85 percent predominantly fine sand and 15 to 20 percent fines from 56 to 75 feet, slight cohesion, some thin nearly clean zones; about 90 to 95 percent medium to fine sand and 5 to 10 percent fines from 75 to 84 feet; very clean from 80 to 84 feet; little lignite slack and fines concentrations from 75 to 80 feet; about 80 to 85 percent medium to fine sand and 15 to 20 percent fines from 84 to 93 feet; slight cohesion, thin clean zones; about 90 to 95 percent predominantly fine sand and 5 to 10 percent fines from 93 to 106 feet; clean in zones particularly below 100 feet; about 75 percent fine sand and 25 percent fines from 106 to 135.5 feet; some lignite slack concentration below 125 feet; slight with spotty moderate and strong acid reaction	133.5	135.5
Fox Hills Sandstone:			
	Clay shale, dark-gray, sandy, compact, uncemented; with little greenish tinge	4.5	140

154-077-30DDC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1544 feet	Date drilled:	10/09/74
Glacial drift:			
	Sand, fine to very coarse, oxidized	29	29
	Sand, very fine to very coarse	34	63

154-077-31ADB
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 8/17/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sandy loam	1	1
	Coarse sand and fine gravel	9	10
	Medium gravel	75	85
	Fine sand	30	115
	Clay	105	220

154-077-31ADC
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 8/17/76

	Sandy loam	1	1
	Coarse sand; with fine gravel	54	55
	Clay	105	160

154-077-31ADD
(Log from Aqua Well Drilling & Pump Co., Inc.)

Altitude: 1545 feet

Date drilled: 8/17/76

	Sandy loam	1	1
	Medium sand	19	20
	Coarse sand	22	42
	Medium sand	19	61
	Medium gravel and trace of lignite	29	90
	Fine sand	68	158
	Clay	2	160

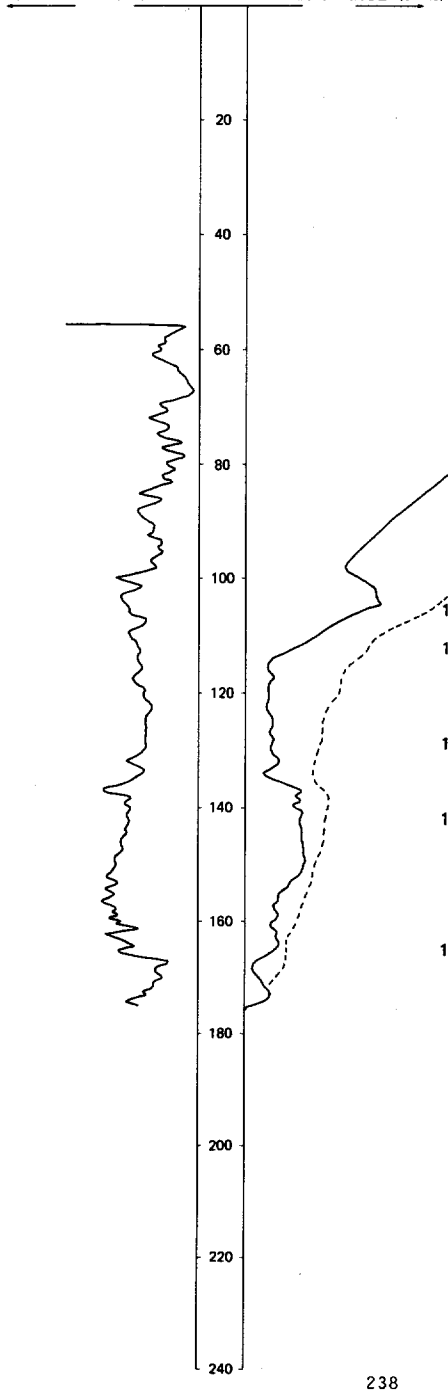
NDSWC 5311

LOCATION: 154-077-32AAD

DATE DRILLED: 5/23/78

ALTITUDE: (FT, NGVD) 1536

DEPTH: (FT) 180



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-21	Sand, fine to very coarse, predominantly medium, subrounded, oxidized.
21-34	Gravel, fine to medium; about 30 percent fine to coarse sand; subrounded; all medium gravel from 33 to 34 feet.
34-98	Till, olive-gray, sandy.
98-106	Sand, fine to coarse, subrounded.
106-111	Till, olive-gray, sandy.
111-132	Till, dark-gray, sandy, gravelly.
132-142	Clay, dark-gray, very sandy; abundant detrital lignite.
142-165	Clay, dark-gray, silty; detrital lignite.

FOX HILLS SANDSTONE

165-180	Sandstone, light-gray, very fine, clayey, slightly indurated.

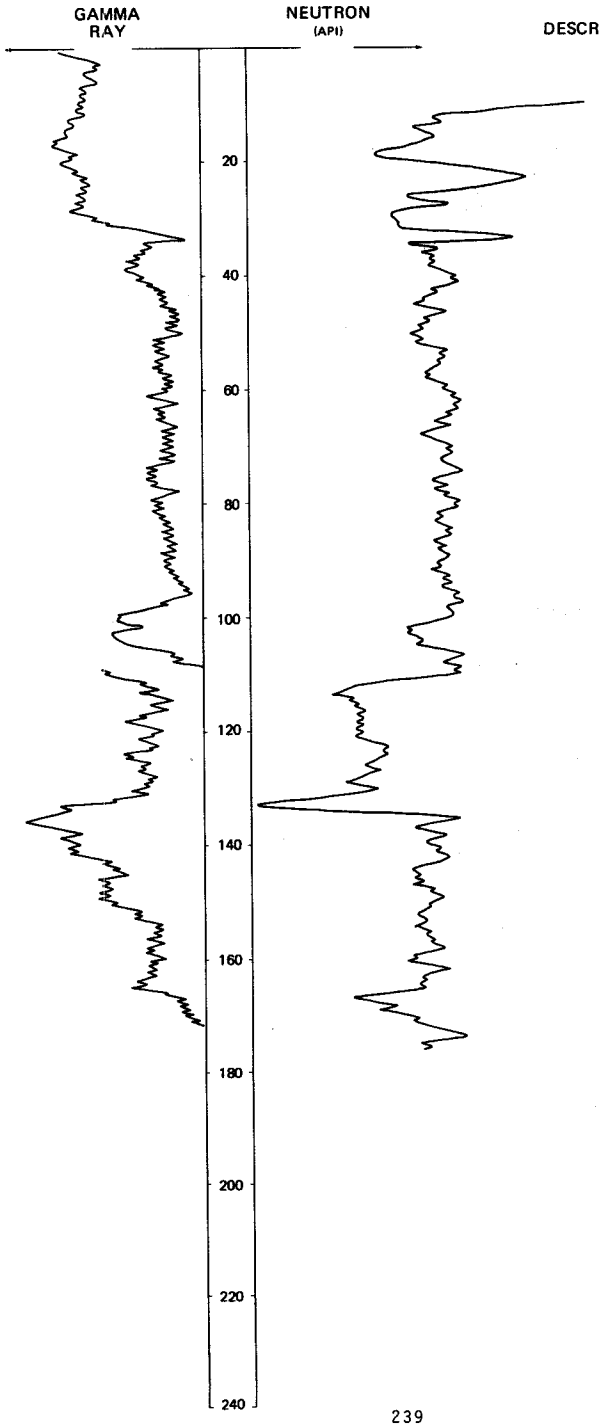
NDSWC 5311, Continued

LOCATION: 154-077-32AAD

DATE DRILLED: 5/23/78

ALTITUDE: 1536
(FT, NGVD)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

154-077-32ADD1
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1532 feet	Date drilled:	8/20/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black, silty, sandy	2	2
	Sand, brown; oxidized to 18 feet; about 90 to 95 percent medium to fine sand and 5 to 10 percent nonplastic to slightly plastic fines; lignite particles scattered throughout with lignite slack concentration from 15 to 17 feet; occasional coarse sand grain and fine gravel	28	30
	Sand, gray; about 90 to 95 percent fine sand and 5 to 10 percent nonplastic fines; trace of clay; fine lignite particles scattered throughout	20	50

154-077-32ADD2
NDSWC 5310

Altitude:	1528 feet	Date drilled:	5/23/78
Glacial drift:			
	Sand, fine to coarse, gravelly, subangular to subrounded; oxidized to 12 feet	22	22
	Sand, coarse, gravelly, subrounded; detrital lignite	17	39
	Sand, very fine to fine, silty, subrounded	19	58
	Till, dark-gray, silty, sandy	51	109
	Sand, fine to coarse; abundant detrital lignite	2	111
	Till, dark-gray, sandy	31	142
	Gravel, fine to medium; about 20 percent coarse sand and about 10 percent silty clay	19	161
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine, slightly indurated; interbedded with brown clayey carbonaceous siltstone	19	180

154-077-32CCA
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1548 feet	Date drilled:	5/16/73
Glacial drift:			
	Sand, fine to very coarse, oxidized	28	28
	Sand, coarse to very coarse	35	63

154-077-32CDB
(Log modified from U.S. Bureau of Reclamation)

Altitude. 1544 feet — Date drilled: 9/01/71

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1.5	1.5
	Sand, brown; about 80 to 85 percent coarse to predominantly fine sand and 15 to 20 percent nonplastic fines; occasional gravel	13.5	15
	Sand, brown; oxidized to 28 feet; about 90 percent coarse to fine sand, approximately 5 percent gravel, and approximately 5 percent fines; trace of clay; little lignite slack at 28 feet	58	73
	Sand, gray; about 90 to 95 percent fine sand and 5 to 10 percent fines	27	100
	Sand, gray; about 75 to 80 percent fine sand and 20 to 25 percent nonplastic fines	13	113
	Sand, gray; about 85 to 90 percent coarse to predominantly fine sand and 10 to 15 percent fines; slight variation in this interval	10.5	123.5
Fox Hills Sandstone:			
	Shale, gray, silty, compact, firm, uncemented, moist; trace of fissility	6.5	130

154-077-32CDC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1544 feet — Date drilled: 5/22/73

Glacial drift:			
	Topsoil, dark-brown	1.5	1.5
	Sand, brown; estimate 85 percent hard medium to fine subangular sand and 15 percent nonplastic fines; traces of fine gravel; lignite fragments scattered throughout	7.5	9
	Sand, brown; dry to 14.5 feet; wet below; estimate 90 percent medium to fine predominantly fine subangular sand, 8 percent nonplastic fines, and 2 percent fine subangular gravel; lignite fragments scattered throughout	11.5	20.5
	Sand, brown; estimate 85 percent coarse to medium predominantly medium subangular sand, 11 percent fine subangular gravel, and 4 percent nonplastic fines; lignite fragments scattered throughout and concentrated from 30 to 32 feet; gravelly zone from 33 to 35 feet	21	41.5
	Sand, brown; estimate 90 percent coarse to medium subangular sand, 7 percent nonplastic fines, and 3 percent fine subangular gravel; lignite fragments scattered throughout	2.5	44
	Sand, gray; estimate 93 percent medium to fine predominantly fine subangular sand and 7 percent nonplastic fines; lignite fragments scattered throughout	6	50

154-077-32DAD
NDSWC 9536

Altitude: 1535 feet — Date drilled: 5/05/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to very coarse, subangular to rounded; oxidized to about 12 feet	39	39
	Till, olive-gray, very silty, sandy	41	80
	Till, dark-gray, silty	20	100
	Till, dark-gray, gravelly	20	120
	Sand, very fine to very coarse; about 40 percent fine to coarse gravel; angular to subrounded	26	146
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine to medium, very clayey, moderately indurated	24	170

154-077-32DCC
(Log from U.S. Bureau of Reclamation)

Altitude: 1545 feet — Date drilled: 5/15/73

Glacial drift:			
	Sand, fine to very coarse; with fine gravel from 1 to 3 feet	23	23
	Sand, fine to very coarse; with fine gravel from 32 to 36 feet	25	48

154-077-32DDD
NDSWC 5309

Altitude: 1540 feet — Date drilled: 5/23/78

Glacial drift:			
	Sand, very fine to medium, predominantly fine, subrounded; oxidized to 17 feet	19	19
	Sand, fine to coarse; about 20 percent fine to medium gravel; subangular to subrounded	8	27
	Till, dark-gray, silty, sandy	85	112
	Sand, fine to medium, gravelly, subrounded	4	116
Fox Hills Sandstone:			
	Shale, grayish-brown, carbonaceous, fissile	8	124
	Sandstone, greenish-gray, very fine, clayey, slightly indurated	7	131
	Siltstone, greenish-gray, clayey, partially indurated	9	140

154-077-33BBB
NDSWC 9389

Altitude: 1536 feet — Date drilled: 8/06/75

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, angular to subrounded; oxidized to 10 feet	16	16
	Till, dark-gray, silty, sandy	24	40
	Till, dark-gray, gravelly	4	44
Hell Creek Formation:			
	Shale, brownish-black, carbonaceous; interbedded with greenish-gray sandy partially indurated siltstone	36	80

154-077-34BCC
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1525 feet	Date drilled:	8/25/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, dark-brown, silty, sandy	5	5
	Sand, brown; about 85 percent medium to predominantly fine sand and 15 percent fines	7	12
	Clay, black, sandy; organic matter appears to be decomposed lignite	3	15
	Sand; gray to brown at 18.5 feet; about 90 percent medium to predominantly fine sand and 10 percent fines; locally higher fines content; few fine gravels from 18.5 to 25 feet	15	30
	Sand, greenish-gray to gray; about 55 percent fine sand and 45 percent nonplastic to slightly plastic fines; some scattered laminations; silt zone from 40 to 41.5 feet; clay lens 0.1 inch thick at 41.5 feet (possibly reworked bedrock)	21	51

154-077-34DAD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1532 feet	Date drilled:	8/26/70
Glacial drift:			
	Topsoil, black, silty, sandy	2	2
	Clay, tan; variable sand content	3.5	5.5
	Sand; brown to gray at 15 feet; about 80 percent fine to predominantly medium and coarse sand, 10 to 15 percent hard subangular to subrounded fine gravel, and 5 to 10 percent fines; fine gravel-sized lignite fragments scattered throughout	22	27.5
	Till, gray, sandy, silty; scattered gravel and lignite fragments	23.5	51

154-077-35BAB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1545 feet	Date drilled:	4/08/76
Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, fine to medium, and some fine to medium gravel; oxidized	11	12
	Sand, fine to very coarse, saturated, oxidized	11	23
	Till, medium-gray; sandy intervals from 43 to 53 feet; predominantly clay	30	53
Fox Hills Sandstone:			
	Sandstone, very fine to medium; becoming carbonaceous shale at 70 feet	25	78

154-077-35BBB1
(Log modified from Farmers Supply Company)

		Date drilled:	10/17/74
	Brown top sand	3	3
	Gravel, coal layers, and coarse sand	15	18
	Gray clay till	44	62

154-077-35BBB2
NDSWC 9391

Altitude: 1536 feet — Date drilled: 8/07/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, angular to subrounded; oxidized to 12 feet	16	16
	Till, dark-gray, sandy	10	26
	Sand, fine to medium, gravelly, subangular	8	34
	Till, dark-gray; sandy to about 50 feet	46	80
	Till, olive-gray, silty, sandy	68	148
	Silt, dark-gray, clayey	18	166
	Sand, fine to very coarse, predominantly coarse, angular to subrounded	6	172
	Gravel, coarse; cobbles	4	176
Fox Hills Sandstone:			
	Siltstone, greenish-gray, clayey; carbonaceous streaks	14	190
	Shale, brownish-gray, partially carbonaceous, fissile	10	200

154-077-35BCA1
NDSWC 9392

Altitude: 1542 feet — Date drilled: 8/07/75

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, angular to subrounded; oxidized to about 20 feet	25	25
	Till, dark-gray, silty, sandy	7	32
	Sand, very fine to fine, subrounded to rounded	12	44
	Till, dark-gray, silty to very sandy	35	79
	Sand, fine to medium, predominantly medium, angular to subrounded; becoming coarser below 100 feet	41	120
	Sand, fine to coarse, predominantly coarse, angular to rounded	33	153
	Cobbles and boulders	3	156
Hell Creek Formation:			
	Siltstone, greenish-gray, sandy, partially indurated; some carbonaceous streaks	16	172
	Shale, brownish-gray, carbonaceous, fissile	8	180

154-077-35BCC
(Log modified from Farmers Supply Company)

Date drilled: 10/17/74

Brown sand	3	3
Brown coarse sand	10	13
Coarse sand and fine gravel	12	25
Gray sandy clay	5	30
Gray fine silty sand; some lignite and fine gravel	53	83
Gray sandy clay till	13	96

154-077-35BCD
(Log from Farmers Supply Company)

Date drilled: 10/17/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Brown sand	3	3
	Coarse gravel and sand	23	26
	Gray clay	8	34
	Medium gravel	2	36
	Clay; with gravel layers; approximately 2-1/2 feet of gravel	6	42
	Medium-coarse gravel; some boulders (lost circulation)	40	82

154-077-35BDC
(Log modified from Farmers Supply Company)

Date drilled: 10/17/74

	Brown top sand	3	3
	Medium gravel	13	16
	Coarse sand	8	24
	Gray sandy clay	10	34
	Rock	1	35
	Gray hard clay	7	42

154-077-35BDD
NDSWC 9393

Altitude: 1537 feet — Date drilled: 8/07/75

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse; about 30 percent fine to medium gravel; angular to subrounded	40	40
	Till, dark-gray, silty, sandy	5	45
	Sand, fine to medium, predominantly medium, subrounded to rounded	20	65
	Sand, fine to very coarse, predominantly coarse; about 30 percent gravel; subrounded to rounded	14	79
	Cobbles and boulders	3	82
Hell Creek Formation:			
	Shale, brownish-gray, silty, carbonaceous; interbedded with thin lenses of bluish-gray very fine clayey slightly indurated sandstone	38	120

154-077-35CCC
NDSWC 9395

Altitude: 1555 feet — Date drilled: 8/11/75

Glacial drift:			
	Till, yellowish-brown to dusky-brown, sandy, oxidized	35	35
	Till, dark-gray, silty; occasional thin lenses of fine sand	80	115
	Till, dark-gray, very silty, slightly sandy	17	132
	Till, dark-gray, silty, sandy	82	214
	Clay, dark-gray, silty, sandy	32	246
	Gravel, fine to coarse, angular to subrounded; cobbles	4	250
Fox Hills Sandstone:			
	Sandstone, light-greenish-gray, fine, clayey; thin lenses of limestone	6	256
	Shale, greenish-brown, silty, fissile	4	260

154-077-36CBC
NDSWC 5306

Altitude: 1536 feet — Date drilled: 5/23/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, gravelly, subangular to subrounded; oxidized to 8 feet	9	9
	Till, dark-gray, sandy, gravelly	24	33
Fox Hills Sandstone:			
	Shale, light-brown, fissile; interbedded with gray slightly sandy siltstone	8	41
	Sandstone, light-green, very fine, clayey	10	51
	Shale, dark-brown, silty, carbonaceous	15	66
	Sandstone, greenish-brown, fine to medium, silty, partially indurated	3	69
	Shale, dark-brown, silty, carbonaceous, indurated	11	80

154-078-02BBC
NDSWC 10064

Altitude: 1508 feet — Date drilled: 11/09/77

Glacial drift:			
	Topsoil, brown, sandy	1	1
	Sand, medium, subrounded, oxidized	10	11
	Gravel, medium to coarse, subangular to subrounded, oxidized	7	18
	Till, dark-gray, silty, sandy	27	45
Fox Hills Sandstone:			
	Shale, grayish-brown, silty, carbonaceous, fissile	17	62
	Sandstone, greenish-gray, fine, bentonitic	13	75

154-078-03DDD
NDSWC 10061

Altitude: 1500 feet — Date drilled: 11/08/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Silt, brown, clayey, oxidized	1	2
	Gravel, fine to medium, subangular to subrounded, oxidized	6	8
	Till, dark-gray, sandy	25	33
Fox Hills Sandstone:			
	Shale, brownish-black, lignitic	4	37
	Sandstone, greenish-gray, fine, silty; some carbonaceous streaks	23	60

154-078-05DDC
NDSWC 10065

Altitude: 1492 feet — Date drilled: 11/09/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brown	1	1
	Sand, fine, rounded, oxidized	3	4
	Till, yellowish-brown, gravelly, oxidized	3	7
	Till, dark-gray, gravelly	31	38
	Gravel, fine to medium, subangular	5	43
	Cobbles	1	44
Fox Hills Sandstone:			
	Shale, medium-brown, carbonaceous; thin lenses of gray limestone	11	55
	Shale, light-greenish-gray, bentonitic; carbonaceous streaks	5	60

154-078-07BBC
(Log from Donald & Keith Erck Well Drilling, Inc.)

Date drilled: 3/29/74

Black dirt	2	2
Yellow clay	88	90
Coal particles	2	92
Gray clay	14	106
Coarse sand	66	172

154-078-10ADD
NDSWC 10062

Altitude: 1475 feet — Date drilled: 11/09/77

Alluvium:			
	Topsoil, brownish-black	1	1
	Silt, yellowish-brown, silty, oxidized	23	24
	Clay, dark-gray, silty	17	41
	Clay, olive-gray, cohesive	7	48
	Silt, grayish-brown, sandy; with lenses of clay	18	66
	Silt, dark-gray, sandy	10	76
	Sand, medium, subrounded	7	83
	Gravel, fine to medium, subrounded	4	87
Fox Hills Sandstone:			
	Shale, grayish-brown, lignitic; interbedded with fine silty sandstone; carbonaceous streaks	13	100

154-078-14CCC
NDSWC 9385

Altitude:	1525 feet	Date drilled:	8/05/75
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, predominantly coarse, angular to subrounded, oxidized	4	4
	Gravel, fine to coarse; about 30 percent fine to very coarse sand; angular to subrounded	8	12
	Till, medium-dark-gray, silty, sandy	22	34
	Sand, fine to medium, clayey, subrounded	35	69
	Till, dark-gray, sandy, pebbly	11	80
	Gravel, fine to medium, angular to subrounded; abundant detrital lignite	6	86
	Till, dark-gray, silty, sandy	4	90
Fox Hills Sandstone:			
	Shale, brownish-gray to brownish-black, silty, carbonaceous; interbedded with lenses of greenish-gray fine clayey sandstone	30	120

154-078-15AAA
NDSWC 10063

Altitude:	1474 feet	Date drilled:	11/09/77
Alluvium:			
	Topsoil, black	1	1
	Clay, yellowish-brown, plastic, cohesive	22	23
	Clay, dark-gray, silty, cohesive	26	49
Fox Hills Sandstone:			
	Shale, brownish-gray, carbonaceous, fissile	23	72
	Sandstone, light-greenish-gray, fine, silty, slightly indurated	8	80

154-078-18BAA
NDSWC 5318

Altitude:	1530 feet	Date drilled:	5/25/78
Alluvium:			
	Clay, dark-brown, sandy; about 30 percent silt; oxidized	8	8
Glacial drift:			
	Till, yellowish-brown, silty, sandy, oxidized	8	16
	Sand, very fine to fine, subrounded, about 30 percent silt	8	24
	Sand, medium to coarse, predominantly coarse, subangular to subrounded; some detrital lignite and cobbles	27	51
	Till, dark-gray, silty	19	70
	Sand, fine to coarse, gravelly, subrounded	4	74
	Till, dark-gray, silty	22	96
	Sand, fine to coarse, gravelly, subangular to subrounded	5	101
	Till, dark-gray, silty	6	107
Fox Hills Sandstone:			
	Siltstone, dark-brownish-gray, clayey, carbonaceous	15	122
	Sandstone, light-green, very fine, clayey, slightly indurated; carbonaceous streaks	18	140

154-078-19DCD
NDSWC 5317

Altitude:	1485 feet	Date drilled:	5/24/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Clay, medium-gray; about 20 percent silt and about 20 percent very fine sand	7	7
	Clay, light-green; about 30 percent silt	15	22
	Silt, dark-gray; about 40 percent gray clay and about 10 percent very fine sand	8	30
	Clay, dark-gray, sandy; about 40 percent dark-gray silt	48	78
Glacial drift:			
	Gravel, fine to coarse; about 30 percent fine to coarse sand; predominantly fine; subrounded; cobbles	7	85
	Gravel, fine to coarse, predominantly medium; about 10 percent fine to coarse sand; angular to subrounded; some detrital lignite; numerous cobbles and boulders	20	105

154-078-20ABC
NDSWC 5316

Altitude:	1480 feet	Date drilled:	5/24/78
Alluvium:			
	Silt, dark-brown; about 40 percent clay; oxidized	18	18
	Clay, light-green to dark-green, slightly sandy; about 40 percent silt	35	53
Fox Hills Sandstone:			
	Sandstone, light-green, very fine, silty; interbedded with brownish-green clayey siltstone; carbonaceous streaks	27	80

154-078-20CAD
NDSWC 5315

Altitude: 1482 feet — Date drilled: 5/24/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Silt, dark-brown; about 40 percent clay; oxidized	11	11
	Clay, dark-gray; about 30 percent silt; with occasional lenses of black very carbonaceous silt	6	17
	Silt, dark-gray; about 40 percent clay; abundant fossil fragments	6	23
Glacial drift:			
	Gravel, fine to coarse; about 20 percent fine to coarse sand; subangular; abundant cobbles and boulders	17	40

154-078-20CCC
NDSWC 5313

Altitude: 1484 feet — Date drilled: 5/24/78

Alluvium:			
	Clay, dark-brown; about 40 percent silt and about 10 percent fine to medium sand	17	17
	Clay, dark-gray; about 40 percent silt; abundant fossils	9	26
	Silt, medium-gray; about 20 percent cohesive clay	6	32
	Clay, dark-gray; about 40 percent silt	15	47
Glacial drift:			
	Gravel, fine to coarse; about 20 percent medium to coarse sand; subangular to subrounded; abundant detrital shale and lignite; numerous wood fragments	11	58
	Gravel, fine to very coarse, sandy; numerous cobbles and boulders	4	62

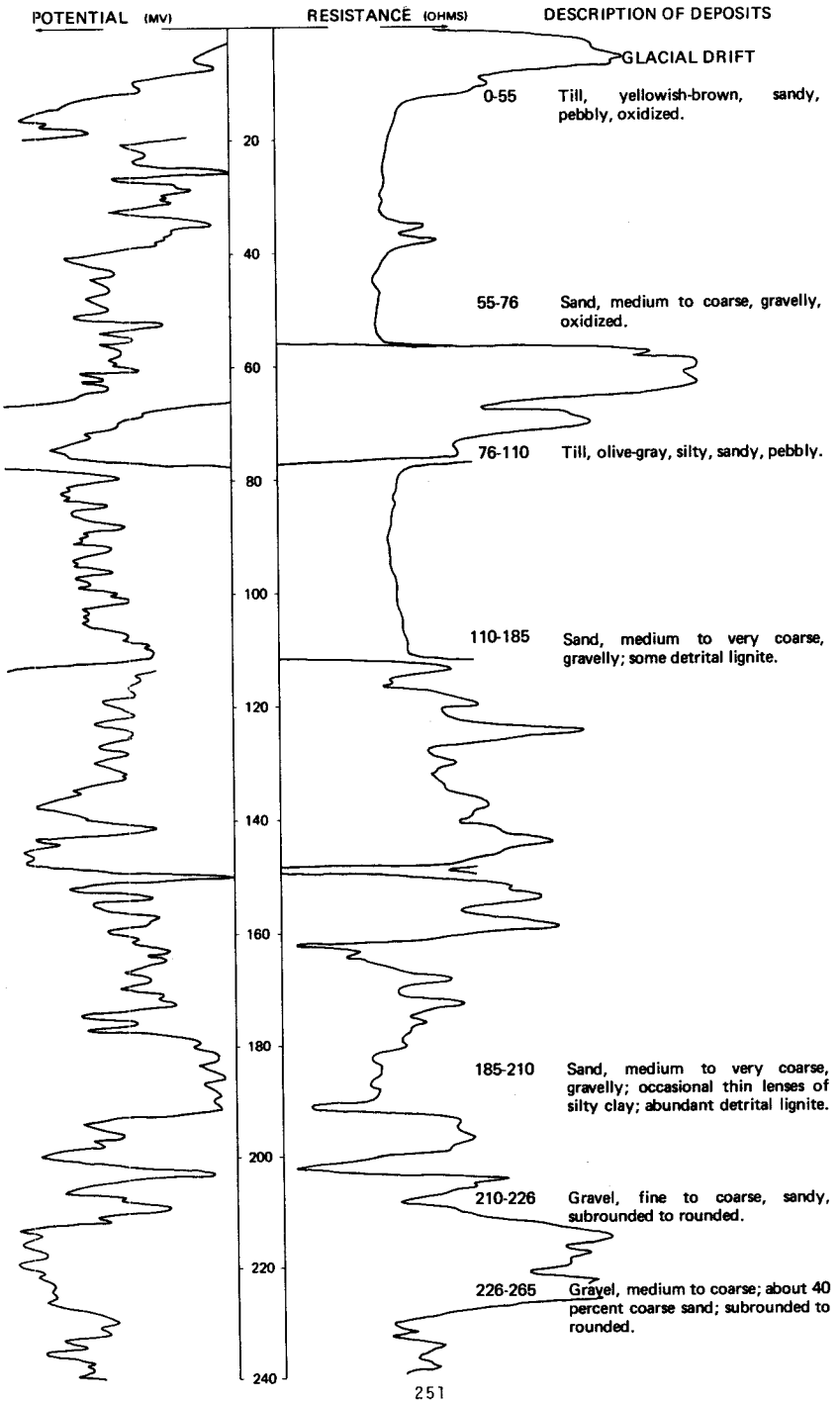
NDSWC 9555

LOCATION: 154-078-24CCC

DATE DRILLED: 5/19/76

ALTITUDE: 1590
(FT, NGVD)

DEPTH: 320
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-55 Till, yellowish-brown, sandy, pebbly, oxidized.

55-76 Sand, medium to coarse, gravelly, oxidized.

76-110 Till, olive-gray, silty, sandy, pebbly.

110-185 Sand, medium to very coarse, gravelly; some detrital lignite.

185-210 Sand, medium to very coarse, gravelly; occasional thin lenses of silty clay; abundant detrital lignite.

210-226 Gravel, fine to coarse, sandy, subrounded to rounded.

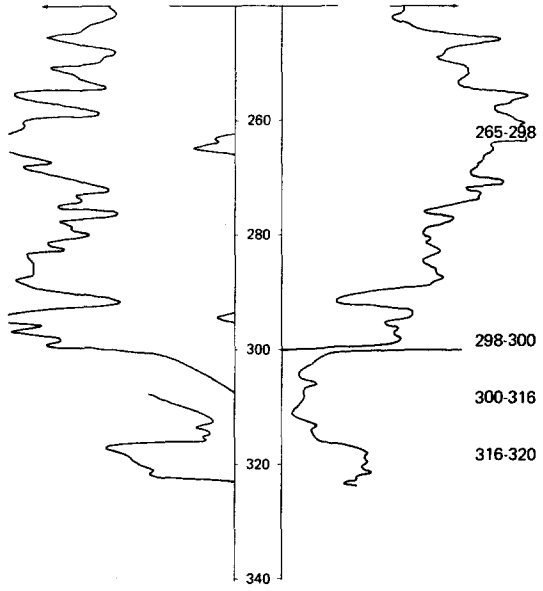
226-265 Gravel, medium to coarse; about 40 percent coarse sand; subrounded to rounded.

LOCATION: 154-078-24CCC

DATE DRILLED: 5/19/76

ALTITUDE: (FT, NGVD) 1590

DEPTH: (FT) 320



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

265-298 Sand, medium to coarse; about 30 percent gravel; subangular to rounded; occasional thin lenses of silty clay.

FOX HILLS SANDSTONE

298-300 Sandstone, greenish-gray, fine to medium, indurated.

300-316 Shale, dark-brown, carbonaceous, fissile, moderately indurated.

316-320 Sandstone, greenish-gray, fine to medium, silty, moderately indurated.

154-078-25BAA
(Log from Verne R. Peterson Well Drilling)

Altitude. 1460 feet

Date drilled: 6/17/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Yellow clay	12	12
	Sand	2	14
	Clay	8	22
	Gravel and clay mix	31	53
	Coal chips; gravel	41	94
	Coal layer	2	96
	Gravel	16	112
	Green sand	2	114
	Sandstone	2	116
	Shale	4	120

154-078-25BAB
(Log from Verne R. Peterson Well Drilling)

Date drilled: 6/17/75

	Coarse sand	46	46
	Sandy clay	6	52
	Gray clay	12	64
	Green sand	8	72
	Clay	9	81
	Green sand	12	93
	Sandstone	2	95
	Shale	5	100

154-078-25CB
(Log modified from Verne R. Peterson Well Drilling)

Date drilled: 6/25/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Gravel	8	8
	Yellow clay	20	28
	Hardpan gravel with coal chips; dirty	2	30
	Gravel and sand	84	114
	Gray clean sand	8	122
	Yellow clay	9	131
	Rock and coarse gravel	7	138
	Shale	2	140

154-078-25CBB2
(Log modified from Verne R. Peterson Well Drilling)

Date drilled: 6/25/75

	Light topsoil	1	1
	Yellow soft clay	27	28
	Medium sand	34	62
	Dirty sand; clay mix	18	80
	Gravel; becoming coarse and cleaner	22	102
	Gray clean sand; can be held with 30-slot screen	21	123
	Coarse gravel and large rock; clean; no sand	8	131
	Shale	7	138

154-078-25CBC
(Log modified from Verne R. Peterson Well Drilling)

Date drilled: 6/24/75

	Sand	34	34
	Gravel; with clay	2	36
	Green dirty sand; clay mix	33	69
	Rock	3	72
	Shale	8	80

154-078-25CCC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1551 feet

Date drilled: 8/13/70

Glacial drift:			
	Topsoil	0.5	0.5
	Sand, brown; about 85 to 95 percent coarse to predominantly fine sand and 5 to 15 percent fines; trace of gravel	31.5	32
	Sand, gray; about 75 to 80 percent fine sand and 20 to 25 percent nonplastic fines; occasional lignite slack lamination; occasional clay inclusion	10	42
Hell Creek Formation.			
	Sandstone, gray, unconsolidated	3	45
	Shale, dark-gray, unconsolidated, firm; silty and fine sandy layers and laminations scattered throughout	5	50

154-078-25DAD
(Log modified from U.S. Bureau of Reclamation)

Altitude. 1549 feet — Date drilled: 8/23/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black, sandy	3	3
	Sand, brown; estimate 90 to 95 percent predominantly medium to fine sand and 5 to 10 percent nonplastic fines and traces of fine gravel; lignitic	49.5	52.5
	Sand, gray; estimate 90 to 95 percent fine sand and 5 to 10 percent nonplastic fines; lignitic zones	45	97.5
	Sand, gray; estimate 85 percent predominantly fine sand and 15 percent nonplastic fines; lignitic	7.5	105
	Silt, gray; estimate 90 to 95 percent nonplastic fines and 5 to 10 percent fine sand	3	108
	Sand, gray; estimate 85 percent predominantly fine sand and 15 percent nonplastic fines; lignitic	20	128
	Silt, gray; estimate 90 to 95 percent nonplastic fines and 5 to 10 percent fine sand	5	133
	Sand, gray; estimate 75 percent predominantly fine sand and 25 percent nonplastic fines; lignitic in zones	7	140
	Sand, gray; estimate 90 to 95 percent predominantly fine sand and 5 to 10 percent nonplastic fines	4	144
	Sand, gray; estimate less than 95 percent predominantly fine sand and greater than 5 percent nonplastic fines	8.5	152.5
	Sand; estimate 75 to 80 percent coarse to fine poorly graded sand, 10 to 15 percent nonplastic fines, and 10 percent fine subrounded gravel	2.5	155
	Sand, gray; estimate less than 95 percent predominantly fine sand and greater than 5 percent nonplastic fines	3.5	158.5
	Sand, gray; estimate 70 to 75 percent well-graded sand, 20 percent coarse to fine subrounded gravel, and 5 to 10 percent nonplastic fines	1.5	160
	Sand, gray; estimate less than 90 to 95 percent well-graded sand, 0 to 5 percent fine subrounded to subangular gravel, and greater than 5 percent nonplastic fines	14.5	174.5
	Silt; estimate 70 percent nonplastic fines and 30 percent very fine sand	.5	175
	Sand, gray; estimate 85 to 90 percent well-graded sand, 5 to 10 percent nonplastic fines, and 5 percent subangular gravel	9.5	184.5
	Sand, gray; estimate 70 to 75 percent well-graded sand, 15 to 20 percent nonplastic fines, and 5 to 15 percent coarse to fine gravel; several lignite lenses	14.5	199
	Igneous boulder	1	200
	Till; estimate 60 percent moderate plasticity fines and 40 percent coarse to fine gravel and traces of sand	.5	200.5
Hell Creek Formation:			
	Clay shale, green, unindurated; contains silty laminations	3.5	204

154-078-26BBB
NDSWC 9384

Altitude. 1535 feet — Date drilled: 8/05/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift.			
	Till, yellowish-brown, sandy, oxidized	22	22
	Till, dark-gray, sandy, pebbly	13	35
	Sand, fine to very coarse, predominantly coarse, angular to subrounded	20	55
	Sand, fine to very coarse, predominantly coarse; about 40 percent fine to coarse gravel; angular to rounded	27	82
	Gravel, fine to very coarse, angular to subrounded; abundant detrital lignite	38	120
	Sand, fine to very coarse, predominantly coarse; about 30 percent fine to medium gravel; angular to subrounded; clayey below 140 feet	50	170
	Sand, fine to very coarse, predominantly coarse, subrounded, well-sorted	25	195
	Gravel, fine to coarse, angular to subrounded; abundant detrital lignite	65	260
	Gravel, fine to coarse, snady, angular to subrounded; abundant detrital lignite	38	298
Fox Hills Sandstone			
	Shale, light-greenish-gray, fissile, interbedded with greenish-gray sandy moderately indurated siltstone	22	320

154-078-26CAD
(Log modified from U.S. Bureau of Reclamation)

Altitude 1537 feet — Date drilled: 8/30/72

Glacial drift:			
	Topsoil, black, sandy	2.5	2.5
	Sand, brown; estimate 75 percent coarse to fine sand and 25 percent nonplastic fines	2.5	5
	Sand, brown, estimate 75 to 80 percent well-graded sand, 0 to 5 percent predominantly fine gravel, and 20 percent nonplastic fines	25	30
	Sand, brown; estimate greater than 90 percent coarse to fine well-graded sand, less than 5 percent nonplastic fines, and 5 percent predominantly fine gravel	8	38
	Sand, gray; estimate 60 percent very fine uniform sand and 40 percent nonplastic silty fines; contains a few thin silt lenses	2.4	40.4
	Sand, brown, estimate 65 to 70 percent well-graded sand, 10 to 15 percent coarse to fine subangular to subrounded gravel, and 20 percent nonplastic fines	4.6	45
	Sand, brown, estimate greater than 95 percent predominantly medium to fine sand and less than 5 percent nonplastic fines	2.5	47.5
	Till, gray, estimate 70 percent low plasticity fines, 25 percent coarse to fine sand, and 5 percent gravel	11.5	59
	Clay, brown, estimate 95 percent low to moderate plasticity fines and 5 percent fine sand; contains fine sand partings	.5	59.5
	Sand, brown to gray, estimate 70 percent fine sand and 30 percent nonplastic fines; lignitic silt	27.5	87
	Sand, brown; estimate greater than 95 percent medium to fine sand and less than 5 percent nonplastic fines; lignitic	13	100
	Sand, brown; estimate 70 percent fine sand and 30 percent nonplastic fines; lignitic	2.2	102.2
	Gravel, brown; estimate 60 to 65 percent coarse to fine subrounded to subangular gravel, 20 to 25 percent coarse to fine poorly graded sand, and 15 percent nonplastic fines	1.8	104
Hell Creek Formation.			
	Siltstone, gray, unconsolidated; contains closely spaced 1/8 inch clay partings and lignitic laminations throughout	6	110
	Shale, gray, unconsolidated, massive to 115 feet; thin siltstone partings below 115 feet; highly plastic	10	120

154-078-26CBB
(Log modified from U.S. Bureau of Reclamation)

Altitude.	1538 feet	Date drilled:	7/13/72
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand, fine to very coarse, gravelly, oxidized	17	17
	Sand, fine to very coarse	30	47
	Sand, fine to very coarse, with clay lens	9	56
	Sand, fine to coarse, silty	38	94
	Sand, very fine to fine, silty	14	108

154-078-26CCC1
(Log modified from U.S. Bureau of Reclamation)

Altitude.	1551 feet	Date drilled:	8/12/70
Glacial drift:			
	Sand, brown; about 80 percent coarse to predominantly fine sand and 20 percent nonplastic to slightly plastic fines; trace of fine gravel	24	24
	Till, gray, sandy, silty; few fine gravel and lignite fragments; fine sand lens from 26.5 to 31 feet	26	50

154-078-26CCC2
NDSWC 9383

Altitude:	1556 feet	Date drilled:	8/05/75
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse; about 40 percent fine to coarse gravel; angular to subrounded; oxidized	24	24
	Till, yellowish-brown to dark-gray, silty, sandy; oxidized to 26 feet	38	62
	Gravel, fine to coarse, angular to subrounded	4	66
Hell Creek Formation.			
	Shale, brownish-black, carbonaceous, fissile; interbedded with greenish-gray sandy moderately indurated siltstone; carbonaceous streaks	30	96
	Sandstone, greenish-gray, fine, cemented	---	96

154-078-26CDA
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1537 feet	Date drilled:	8/25/72
Glacial drift.			
	Silt, yellowish-brown, clayey, oxidized	5	5
	Sand, coarse to very coarse, gravelly, oxidized	13	18
	Sand, coarse to very coarse, oxidized	19	37
	Silt, dark-gray, sandy	2	39
	Sand, coarse to very coarse, gravelly	8	47
	Till, dark-gray, sandy	10	57
	Clay, gray, silty	2	59
	Sand, fine to coarse; some clay lenses	42	101
	Gravel, fine to medium	2	103
	Sand, very fine, silty	8	111
Hell Creek Formation.			
	Shale, dark-gray, silty, fissile	9	120

154-078-26CDB
(Log from Farmers Supply Company)

Date drilled: 10/31/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Coarse sand	12	12
	Medium-coarse gravel	27	39
	Gray sandy clay; silty	63	102

154-078-26DAB
NDSWC 1-77

Date drilled: 2/18/77

Glacial drift:			
	Topsoil, brownish-black, sandy	2	2
	Till, brown, oxidized; changing to gray	7	9
	Till, olive-gray, sandy	8	17
	Gravel, fine to coarse, sandy; oxidized surfaces	13	30
	Sand, fine to coarse, mostly medium; lignite fragments; predominantly quartz, carbonate, and igneous rocks	18	48
	Gravel, fine to medium, sandy	4	52
	Sand, very fine to medium, subrounded	11	63
	Gravel, fine to medium, sandy, subrounded to rounded; lignitic at 55 and 73 feet; predominantly igneous and carbonate pebbles	6	69
	Sand, fine to medium, predominantly fine; lignite fragments	23	92
	Sand, very fine to fine; abundant detrital lignite	10	102
	Sand, fine to coarse, predominantly medium to coarse; alternating lenses of fine, medium, and very coarse intervals	41	143
	Till, medium-gray, silty	6	149
Fox Hills Sandstone:			
	Shale, medium-gray, clayey; interbedded with siltstone	11	160

154-078-26DB
(Log from Farmers Supply Company)

Date drilled: 10/30/74

	Topsoil	1	1
	Medium sand	11	12
	Medium gravel	24	36
	Medium-coarse sand	24	60
	Gray sandy clay till	36	96
	Coarse sand	6	102
	Medium gravel; good; has some coarse sand	29	131
	Green sand	11	142

154-078-26DBB1
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/03/75

	Topsoil	1	1
	Fine gravel and sand	29	30
	Medium gravel	9	39
	Coarse gravel	7	46
	Medium gravel	36	82
	Gray clay	28	110
	Coarse gravel	10	120
	Clay	40	160

154-078-26DBB2
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/08/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Medium gravel	4	5
	Fine gravel and sand	5	10
	Medium gravel	11	21
	Coarse gravel	24	45
	Coarse sand	17	62
	Medium gravel	3	65
	Gray clay, with gravel	35	100
	Medium gravel	20	120
	Gray clay; with little gravel	40	160

154-078-26DBC1
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/03/75

	Topsoil	1	1
	Yellow till	10	11
	Yellow till; with fine gravel	7	18
	Fine gravel	14	32
	Medium gravel	6	38
	Coarse gravel	2	40
	Yellow till; with coarse gravel	12	52
	Gray clay	18	70
	Gray clay; with gravel	45	115
	Coarse gravel	2	117
	Clay; with trace of gravel	23	140

154-078-26DBC2
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/03/75

	Topsoil	1	1
	Fine gravel and sand	14	15
	Medium gravel and sand	14	29
	Sand	7	36
	Gray clay; with gravel	24	60
	Gray clay	19	79
	Green clay	3	82
	Gray clay	18	100

154-078-26DCA
(Log modified from Farmers Supply Company)

Date drilled: 10/31/74

	Coarse sand	12	12
	Medium gravel	26	38
	Gravel (lost circulation)	1	39

154-078-26DCB
(Log modified from Farmers Supply Company)

Date drilled: 10/31/74

	Coarse sand	12	12
	Medium gravel and coarse sand	26	38
	Sand; loamy clay	24	62

154-078-27CAD
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 3/22/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Fine sand	39	40
	Coarse sand	10	50
	Gray fine sand	6	56
	Coarse sand and gravel	4	60
	Fine gravel	11	71
	Medium gravel	12	83
	Gray clay	4	87
	Medium gravel	18	105
	Clay; with medium gravel	10	115
	Coarse gravel	32	147
	Gravel and sand	13	160

154-078-27CBC
(Log modified from U.S. Bureau of Reclamation)

Altitude. 1543 feet — Date drilled: 8/09/72

Glacial drift:			
	Topsoil, black, sandy	5	5
	Sand, brown; estimate 85 percent coarse to fine predominantly fine sand and 15 percent nonplastic fines	8	13
	Sand, brown; estimate 80 percent coarse to fine well-graded sand, 10 percent fine subrounded gravel, and 10 percent nonplastic fines	12	25
	Sand, brown; estimate 85 percent coarse to fine predominantly fine sand and 15 percent nonplastic fines	9	34
	Sand, brown; estimate 80 percent coarse to fine well-graded sand, 10 percent fine subrounded gravel, and 10 percent nonplastic fines	6	40
	Sand, brown; estimate greater than 90 percent coarse to fine well-graded sand, 5 percent fine subrounded gravel, and less than 5 percent nonplastic fines	6	46
	Sand, brown; estimate 80 percent coarse to fine well-graded sand, 10 percent fine subrounded gravel, and 10 percent nonplastic fines	7	53
	Sand, brown; estimate greater than 95 percent predominantly fine sand and less than 5 percent nonplastic fines	15	68
	Sand, brown; estimate 80 to 85 percent fine sand and 15 to 20 percent nonplastic fines	18	86
	Sand, brown; estimate 75 percent coarse to fine well-graded sand, 10 percent fine subrounded gravel, and 15 percent nonplastic fines	11.5	97.5
	Sand, gray; estimate 80 percent predominantly fine sand and 20 percent nonplastic fines; lignitic	6.5	104
	Sand, brown; estimate 75 percent coarse to fine well-graded sand, 10 percent fine subrounded gravel, and 15 percent nonplastic fines	2.5	106.5
	Sand, gray; estimate 80 percent predominantly fine sand and 20 percent nonplastic fines; lignitic	3.5	110
	Sand; gray to brown at 120 feet; estimate 70 to 75 percent coarse to fine well-graded sand, 20 percent nonplastic fines, and 5 to 10 percent coarse to fine gravel	19	129
	Sand, gray; estimate 80 to 85 percent predominantly fine sand and 15 to 20 percent nonplastic fines; lignitic	16	145
	Till, gray; estimate 80 percent nonplastic fines and 20 percent very fine sand, traces of coarser sand grains embedded in silt	6	151
Fox Hills Sandstone:			
	Siltstone, gray, unconsolidated, firm, laminated	4	155

154-078-27CDD
NDSWC 9558

Altitude: 1540 feet — Date drilled: 5/19/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very coarse; about 40 percent fine to medium gravel, oxidized to about 25 feet	69	69
	Till, olive-gray, silty, sandy	2	71
Hell Creek Formation:			
	Sandstone, greenish-gray, very fine to fine, poorly indurated	29	100

154-078-27DBC
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 3/22/75

Topsoil	1	1
Fine sand	39	40
Coarse sand and lignite	12	52
Fine gravel and lignite	26	78
Clay	3	81
Soft clay; with gravel	21	102
Hard clay	2	104
Clay; with gravel	6	110
Hard clay	3	113
Clay; with gravel	32	145
Coarse sand; with lignite	15	160

154-078-28CBB
NDSWC 5848

Altitude: 1550 feet — Date drilled: 9/30/70

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Gravel, fine to coarse, sandy, angular to rounded, oxidized	30	31
	Till, olive-gray, silty; some cobbles and boulders	49	80
	Sand, fine to very coarse, gravelly, angular to rounded, occasional thin lens of silty clay	54	134
	Till, olive-gray, silty	4	138
	Sand, fine to medium, subangular to rounded	2	140
	Clay, dark-gray, very silty; interbedded with thin lenses of fine sand	21	161
	Sand, very fine to very coarse, subangular to rounded; occasional thin lenses of silty clay	16	177
	Till, dark-gray, silty, moderately sandy	5	182
	Gravel, fine to coarse, sandy, angular to well-rounded	18	200
	Sand, fine to very coarse, gravelly, angular to rounded; occasional thin lenses of silty clay	68	268
Fox Hills Sandstone:			
	Shale, brownish-gray to dark-greenish-gray, sandy, partially carbonaceous, moderately indurated	12	280

154-078-28DAC
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 10/12/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Yellow till	3	4
	Coarse gravel and sand	33	37
	Brown clay	7	44
	Medium gravel	7	51
	Yellow clay and sand	3	54
	Medium gravel	4	58
	Yellow sandy clay	47	105
	Medium sand	13	118
	Gray clay and lignite	7	125
	Medium gravel	27	152
	Gray clay and lignite	10	162

154-078-28DDB
(Log from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 10/12/76

	Topsoil	1	1
	Yellow till	3	4
	Medium sand	51	55
	Coarse sand and gravel	20	75
	Clay	5	80

154-078-29BBA
NDSWC 5314

Altitude: 1485 feet

Date drilled: 5/24/78

Alluvium:			
	Clay, dark-brown; about 30 percent silt and 10 percent fine sand; oxidized	16	16
	Clay, dark-gray; about 40 percent silt; abundant fossils	13	29
	Clay, dark-gray, silty, sandy	12	41
Glacial drift:			
	Gravel, fine to very coarse, sandy; numerous cobbles and boulders	10	51

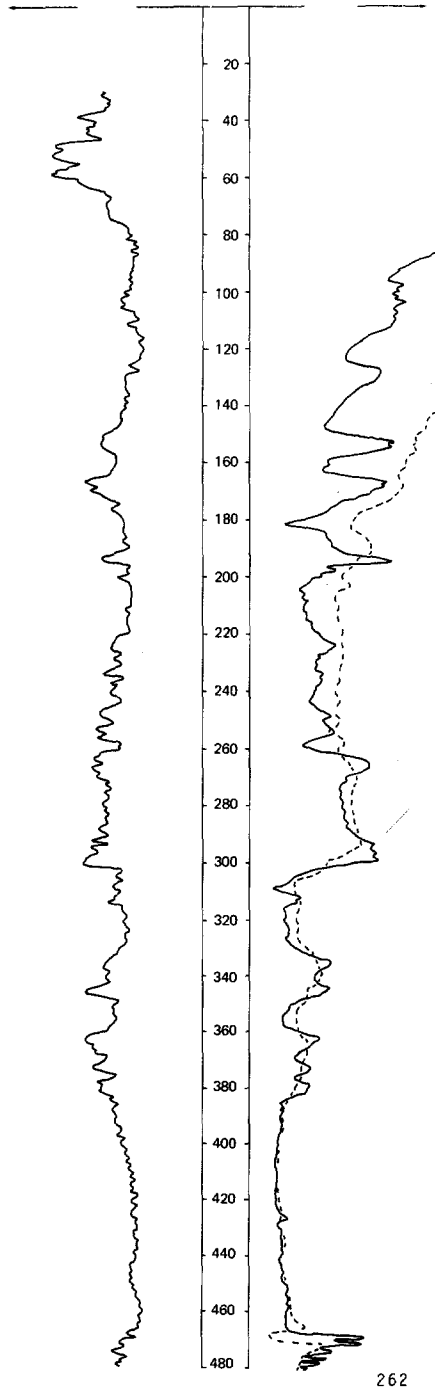
NDSWC 4976, 4976A

LOCATION: 154-078-31BAA1, 2

DATE DRILLED: 9/09/76

ALTITUDE (FT, NGVD): 1550

DEPTH (FT): 540



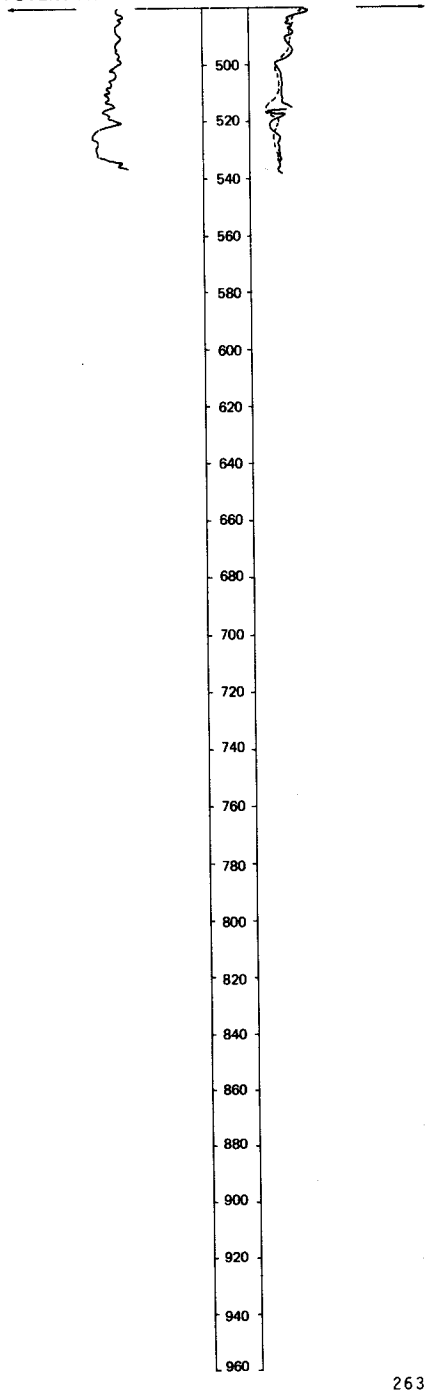
	DESCRIPTION OF DEPOSITS
	GLACIAL DRIFT
0-10	Sand, very fine to medium, clayey, subangular to rounded, oxidized.
10-20	Gravel, fine to coarse, subangular to subrounded, oxidized.
	CANNONBALL MEMBER
20-75	Shale, dark-brownish-gray, silty, carbonaceous; sandy from 48 to 58 feet.
75-79	Sandstone, greenish-gray, fine to medium, indurated.
	HELL CREEK FORMATION
79-165	Shale, dark-brownish-gray, carbonaceous; interbedded with lenses of bluish-gray siltstone and greenish-gray fine clayey sandstone; carbonaceous streaks.
165-173	Sandstone, dark-greenish-gray, very fine to fine, clayey.
173-180	Shale, brownish-gray, fissile; interbedded with greenish-gray sandy moderately indurated siltstone.
180-262	Shale, dark-brownish-gray, silty, bentonitic; lignitic from 194 to 198 feet.
262-302	Sandstone, greenish-gray, very fine to fine, clayey.
302-333	Shale, brownish-gray, bentonitic, partly carbonaceous; silty from 302 to 314 feet.
	FOX HILLS SANDSTONE
333-383	Sandstone, greenish-blue, very fine to fine, clayey; gray clayey siltstone from 349 to 359 feet.
383-470	Shale, dark-gray, silty to slightly sandy; carbonaceous streaks.
470-483	Sandstone, grayish-green, fine; interbedded with dark-gray silty shale.

LOCATION: 154-078-31BAA1, 2

DATE DRILLED: 9/09/76

ALTITUDE: 1550
(FT, NGVD)

DEPTH: 540
(FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

483-498 Shale, dark-gray, silty, bentonitic, fissile.

PIERRE SHALE

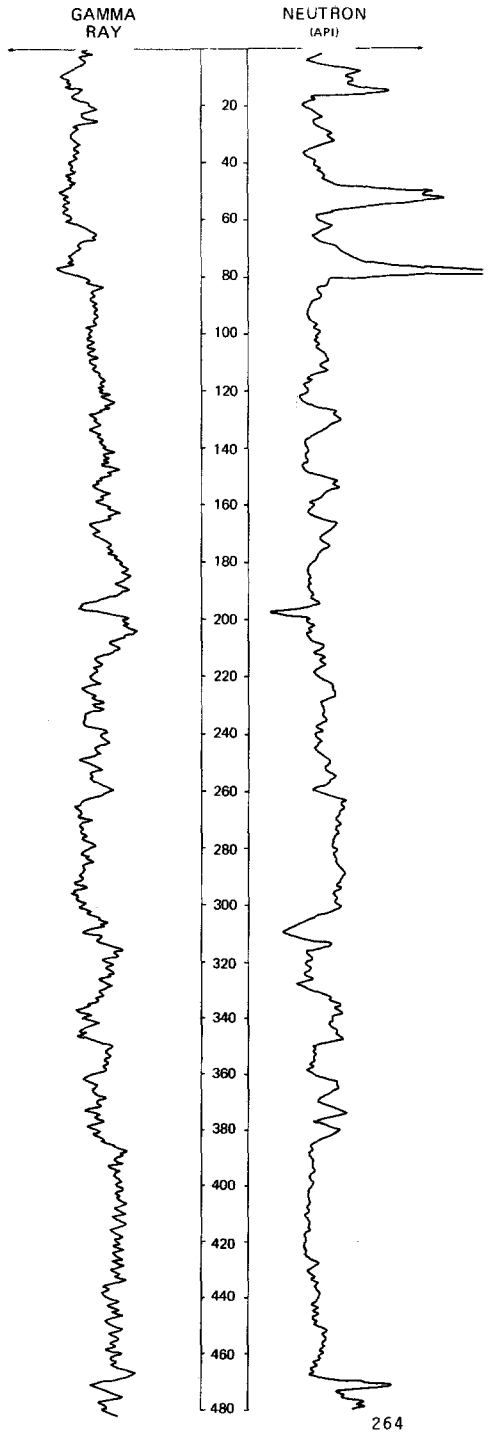
498-540 Shale, grayish-black to black, siliceous, tight, brittle.

LOCATION: 154-078-31BAA1, 2

DATE DRILLED: 9/09/76

ALTITUDE: 1550
(FT, NGVD)

DEPTH: 540
(FT)



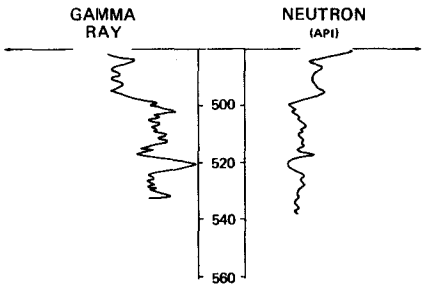
DESCRIPTION OF DEPOSITS

LOCATION: 154-078-31BAA1, 2

DATE DRILLED: 9/09/76

ALTITUDE: 1550 (FT, NGVD)

DEPTH: 540 (FT)



DESCRIPTION OF DEPOSITS

154-078-32CAD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1568 feet

Date drilled: 6/30/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Clay, brown; estimate 80 percent moderate plasticity fines and 20 percent predominantly fine sand	1	2
	Clay, yellowish-brown; estimate 75 percent moderate plasticity fines and 25 percent predominantly fine sand	3	5
	Till, yellowish-brown; estimate 70 percent moderate to high plasticity fines and 30 percent medium to fine sand; trace of gravel	17.5	22.5
	Till, yellowish-brown; estimate 60 percent predominantly fine sand and 40 percent nonplastic fines; trace of gravel contains sand lenses	.5	23
	Till; yellowish brown to 25 feet; bluish gray from 25 to 30 feet; estimate 70 percent high plasticity fines and 30 percent medium to fine sand; trace of gravel	7	30
Cannonball Member:			
	Shale, gray, partially indurated; contains thin alternating light-gray silty clay shale and dark-gray clay shale	5	35
	Sandstone, gray, uncemented; estimate 65 percent fine sand and 35 percent nonplastic fines; contains thin plastic clay lenses	5	40
	Shale, gray, partially indurated; contains thin alternating light-gray silty clay shale and dark-gray clay shale	10	50

154-078-33AAA
(Log modified from U.S. Bureau of Reclamation)

Altitude.	1553 feet	Date drilled.	8/11/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Sand, brown, dry to 30 feet; about 45 percent coarse to fine sand and 35 percent coarse to fine subangular to subrounded gravel; scattered traces of organic matter	37	38
	Till; brown to gray at 40 feet, about 60 percent nonplastic to low plasticity fines and 40 percent very fine sand; occasional coarse sand grain and rare lignite fragment	7	45
	Till, gray; about 70 percent coarse to predominantly fine sand and 30 percent low plasticity fines; occasional fine gravel and rare lignite particles	5	50

154-078-33BAB
(Log modified from U.S. Bureau of Reclamation)

Altitude.	1552 feet	Date drilled.	8/10/70
Glacial drift:			
	Topsoil	0.5	0.5
	Sand, brown, about 70 to 75 percent coarse to predominantly fine sand, 15 to 20 percent nonplastic to medium plasticity fines, and 5 to 10 percent fine to coarse gravel; trace of organic matter near 6 and 10 feet; sand and gravel sizes increase below 20 feet	24	24.5
	Till, gray, sandy, silty; occasional fine gravel and lignite particles; sand lens at 32.5 feet	25.5	50

154-078-33BBB
NDSWC 5843

Altitude.	1540 feet	Date drilled.	9/29/70
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Gravel, fine to coarse, sandy, angular to rounded, oxidized; some cobbles	13	14
	Till, olive-gray, silty, sandy	5	19
Cannonball Member:			
	Shale, brownish-gray to bluish-gray, silty; interbedded with thin lenses of gray very fine clayey sandstone	41	60

154-078-33CBA
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1543 feet	Date drilled.	8/06/70
Glacial drift:			
	Topsoil, black, sandy	1	1
	Till, brown, sandy, silty, leached; occasional gravel	4	5
	Sand, brown; estimate 60 percent well-graded sand and 25 percent predominantly fine subangular to subrounded gravel	13	18
Cannonball Member:			
	Sandstone, gray, compact, uncemented, laminated in zones; clayey zones	18	36
	Clay shale, gray, compact, nonindurated; silty and sandy laminations up to 1/2 inch thick	15	51

154-078-33CCB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1568 feet	Date drilled:	8/05/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black, sandy	0.5	0.5
	Till, tan, sandy, leached, oxidized, high silt content; occasional gravel and lignite fragments	4.5	5
	Till, brown, oxidized, grading to gray at 17 feet with oxidation decreasing with depth, sandy silty scattered gravel and lignite fragments throughout	20	25
	Sand, brown to gray, fine; nearly clean at top; grading to fine grained, clayey sand at bottom; laminated zones	7	32
Cannonball Member:			
	Sandstone, gray, clayey; nonindurated to well indurated from 34 to 40 feet and 0.2 feet at bottom; clay shale bed from 33.5 to 34 feet	18	50

154-078-33CCC
NDSWC 5842

Altitude:	1585 feet	Date drilled:	9/29/70
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, gravelly, oxidized	40	41
Cannonball Member:			
	Sandstone, greenish-gray, very fine to fine, micaceous, moderately indurated	29	70
	Shale, dark-gray, fissile; interbedded with gray very fine clayey sandstone	10	80

154-078-34DDD
NDSWC 9382

Altitude:	1552 feet	Date drilled:	8/05/75
Glacial drift:			
	Sand, fine to very coarse; about 40 percent fine to coarse gravel; angular to subrounded	25	25
Cannonball Member:			
	Sandstone, dark-greenish-gray, fine to medium, slightly indurated, interbedded with brownish-black carbonaceous fissile shale	35	60

154-078-35AAA
NDSWC 9386

Altitude: 1557 feet — Date drilled: 8/06/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly coarse; about 30 percent fine to medium gravel, angular to subrounded	31	31
Hell Creek Formation:			
	Sandstone, greenish-gray, very fine to fine, clayey, semiconsolidated, carbonaceous streaks	13	44
	Shale, brownish-black, silty, fissile, moderately indurated	16	60

154-078-35ABC
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/03/75

Topsoil	1	1
Coarse sand	8	9
Medium gravel	16	25
Gray clay	12	37
Green soft clay	24	61
Green hard clay	18	79
Gray clay	71	150

154-078-35B
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/24/75

Topsoil	1	1
Yellow till; with sand	5	6
Coarse sand and medium gravel	6	12
Yellow till	1	13
Gray clay	27	40

154-078-35BCC1
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/02/75

Topsoil	1	1
Yellow till, with gravel	3	4
Medium gravel and sand	9	13
Coarse gravel and trace of lignite	2	15
Medium gravel	20	35
Gravel; with slight trace of gray sandy clay	2	37
Coarse gravel	6	43
Green clay; with fine gravel	10	53
Brown clay	7	60
Black clay	43	103
Gray clay	18	121
Brown clay	29	150

154-078-35BCC2
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/13/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Yellow till; with gravel	3	4
	Medium gravel and sand	9	13
	Coarse gravel and trace of lignite	2	15
	Medium gravel	20	35
	Gravel; with slight trace of gray sandy clay	2	37
	Coarse gravel	6	43
	Green clay; with fine gravel	2	45

154-078-35BCC3
(Log modified from Aqua Well Drilling & Pump Co., Inc.)

Date drilled: 5/24/75

	Topsoil	0.5	0.5
	Yellow till; with sand	5.5	6
	Coarse sand and small gravel	11	17
	Coarse sand and medium gravel	2	19
	Gray clay	14	33

154-078-35C
(Log modified from Farmers Supply Company)

Date drilled: 10/30/74

	Fine sand	11	11
	Coarse sand and fine gravel	10	21
	Gray sandy soft clay	41	62
	Gray sand	41	103
	Sandstone	2	105
	Gray silty sand	17	122

154-078-35D
(Log modified from Farmers Supply Company)

Date drilled: 10/30/74

	Fine sand	10	10
	Coarse sand and fine gravel	13	23
	Gray fine silty sand	22	45
	Brown shaly clay	15	60
	Brown and gray silty sand	42	102

154-078-36A
(Log modified from Water Supply Inc.)

Date drilled: 9/15/76

	Black sandy topsoil	1	1
	Fine to medium to coarse sand	24	25
	Fine to medium to coarse gravel	2	27
	Bluish-gray to greenish-gray sandy clay; bedrock	13	40

154-078-36AA
(Log modified from Water Supply Inc.)

Date drilled: 9/15/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black sandy topsoil	1	1
	Fine to medium to coarse sand	26	27
	Olive-gray sandy silty clay (till)	24	51
	Bluish-gray to greenish-gray sandy silty clay; bedrock	9	60

154-078-36AAA
NDSWC 9387

Altitude: 1550 feet — Date drilled: 8/06/75

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse; about 30 percent fine to medium gravel; angular to subrounded, oxidized to 17 feet	34	34
	Till, dark-gray, sandy	3	37
	Sand, fine to very coarse; about 30 percent fine to medium gravel; angular to subrounded	5	42
	Till, dark-gray, silty	8	50
Hell Creek Formation:			
	Shale, brownish-gray, slightly carbonaceous, fissile	14	64
	Shale, brownish-gray; interbedded with dark-gray sandy brittle siltstone	16	80

154-078-36ACC
(Log modified from Water Supply Inc.)

Date drilled: 9/15/76

	Black sandy topsoil	1	1
	Fine to medium to coarse sand	21	22
	Fine to medium to coarse gravel	2	24
	Bluish-gray to greenish-gray sandy clay; bedrock	16	40

154-078-36BAA
NDSWC 5312

Altitude: 1554 feet — Date drilled: 5/23/78

Glacial drift:			
	Sand, fine to coarse, gravelly, subangular to subrounded, oxidized; abundant detrital lignite	30	30
	Gravel, fine, sandy, subrounded, oxidized	2	32
	Till, dark-gray, silty, sandy	12	44
Hell Creek Formation:			
	Sandstone, light-gray, very fine; cemented from 50 to 51 feet	7	51
	Shale, dark-brown, carbonaceous, poorly indurated	9	60

154-078-36DDD
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1542 feet	Date drilled:	8/19/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	0.5	0.5
	Sand, brown; about 90 percent coarse to fine sand, 5 to 10 percent fines, and 5 percent gravel in zones	17	17.5
Hell Creek Formation:			
	Sandstone, gray, fine, unconsolidated; high silt and clay content; lignite and clay shale laminations below 40 feet	32.5	50

154-079-09CCD
NDSWC 10068

Altitude:	1562 feet	Date drilled:	11/14/77
Glacial drift:			
	Topsoil, brownish-black, gravelly	1	1
	Till, yellowish-brown, silty, oxidized	1	2
	Sand, fine to coarse, gravelly, oxidized	1	3
	Till, yellowish-brown, silty, oxidized	19	22
	Till, medium-gray, sandy	6	28
	Sand, medium to very coarse, gravelly	4	32
	Till, medium-dark-gray, silty	22	54
	Gravel, fine to medium; interbedded with lenses of sand; fine to very coarse carbonates, granitics, detrital shale, and lignite	5	59
	Clay, brownish-gray, silty to very sandy	9	68
Cannonball Member:			
	Sandstone, light-gray to dark-gray, medium	11	79
	Clay, grayish-brown; silty to sandy streaks	7	86
	Sandstone, grayish-blue, fine to medium, clayey; carbonaceous streaks	6	92
	Shale, grayish-brown, carbonaceous; with streaks of sandstone	8	100

154-079-14CCC1, 2
NDSWC 5319, 5319A

Altitude:	1540 feet	Date drilled:	5/25/78
Glacial drift:			
	Till, yellowish-brown; about 30 percent silt and 10 percent fine sand; oxidized to 13 feet	21	21
	Clay, dark-gray, silty	15	36
	Sand, very fine to fine, subrounded; about 20 percent silt; abundant detrital lignite at 64 feet	37	73
	Sand, medium to coarse; about 20 percent fine to medium gravel; detrital lignite	39	112
	Gravel, fine to coarse; about 30 percent medium to coarse sand; subrounded; interbedded with silty clay from 141 to 153 feet	67	179
	Gravel, fine to coarse; about 30 percent medium to coarse sand; subangular to rounded; abundant coarse detrital lignite	58	237
	Gravel, fine to medium, subangular to subrounded	8	245
Hell Creek Formation:			
	Sandstone, light-greenish-gray, very fine; grading into dark-brown carbonaceous poorly indurated siltstone	15	260

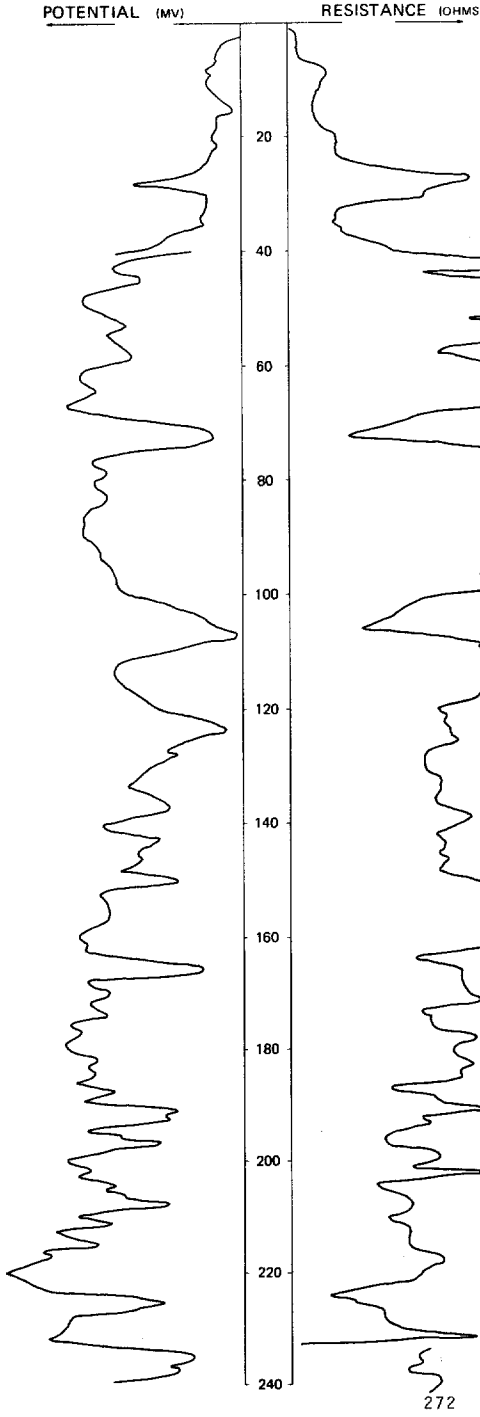
NDSWC 10067

LOCATION: 154-079-16CCC

DATE DRILLED: 11/10/77

ALTITUDE: (FT, NGVD) 1550

DEPTH: (FT) 260



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-24	Till, yellowish-brown, silty, oxidized.
24-32	Sand, very fine, clayey, oxidized.
32-42	Shale, dark-gray, silty, fractured; shove block.
42-68	Silt, dark-gray, clayey; detrital lignite.
68-76	Clay, brownish-gray, silty.
76-100	Sand, very fine to medium; with lenses of detrital lignite.
100-150	Sand, fine to medium, subrounded; interbedded with silt and detrital lignite.
150-186	Sand, medium to coarse; about 30 percent medium gravel; subangular to subrounded; with detrital lignite.
186-232	Sand, fine to medium, subangular; interbedded with dark-gray clayey silt; abundant detrital lignite from 204 to 231 feet.

HELL CREEK FORMATION

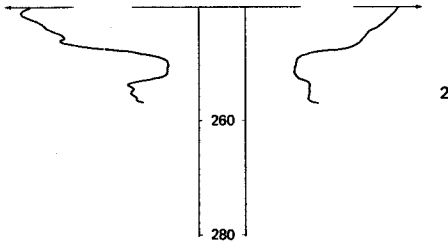
232-248	Sandstone, light-gray, fine, clayey, slightly indurated.

LOCATION: 154-079-16CCC

DATE DRILLED: 11/10/77

ALTITUDE: 1550
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

HELL CREEK FORMATION, Continued

248-260 Shale, grayish-brown, silty, carbonaceous; bentonitic streaks.

154-079-19BCB
(Log modified from U.S. Bureau of Reclamation)

Altitude. 1572 feet

Date drilled: 8/17/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	1	1
	Till, buff; becoming gray and brown at 10 feet; silty sandy zones throughout; occasional fine to medium gravel	13	14
	Sand, brown, silty fine and very fine sand, occasional zone of medium sand and occasional clayey zone	12	26
	Sand and gravel, tan, silty	2	28
	Till, tan, silty, sandy; fine gravel in upper portion; lignite fragments throughout	5	33
	Till, gray; fine gravel throughout; occasional lignite fragments	7	40

154-079-20ADD
(Log modified from U.S. Bureau of Reclamation)

Altitude.	1564 feet	Date drilled.	8/17/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	0.8	0.8
	Sand, buff, silty; with some gravel	2.5	3.3
	Till, brown, silty; becoming gray at 25.3 feet, with sandy zones; some fine gravel throughout, occasional lignite fragments, oxidized to 17 feet, slightly oxidized from 17 to 25.3 feet	25.2	28.5
	Sand and gravel, gray and tan; clayey coarse sand and fine gravel	1.5	30
	Till, gray, silty, sandy; some fine to medium gravel throughout	8	38

154-079-22CCC
(Log modified from U.S. Bureau of Reclamation)

Altitude.	1564 feet	Date drilled:	8/16/55
Glacial drift:			
	Topsoil	0.4	0.4
	Silt, limey gray, clayey, with very fine sand; few gravels	3.5	3.9
	Till, buff, silty, sandy; becoming buff and gray at 27 feet, some fine to coarse gravel throughout, occasional lignite fragments, oxidized to 27 feet with slight oxidation from 27 to 31.4 feet	27.1	31
	Clay, dark-gray, silty, moderately plastic; thin very fine sand seams	4	35
	Sand, gray, very fine, silty, lenses of dark-gray plastic clay	3	38

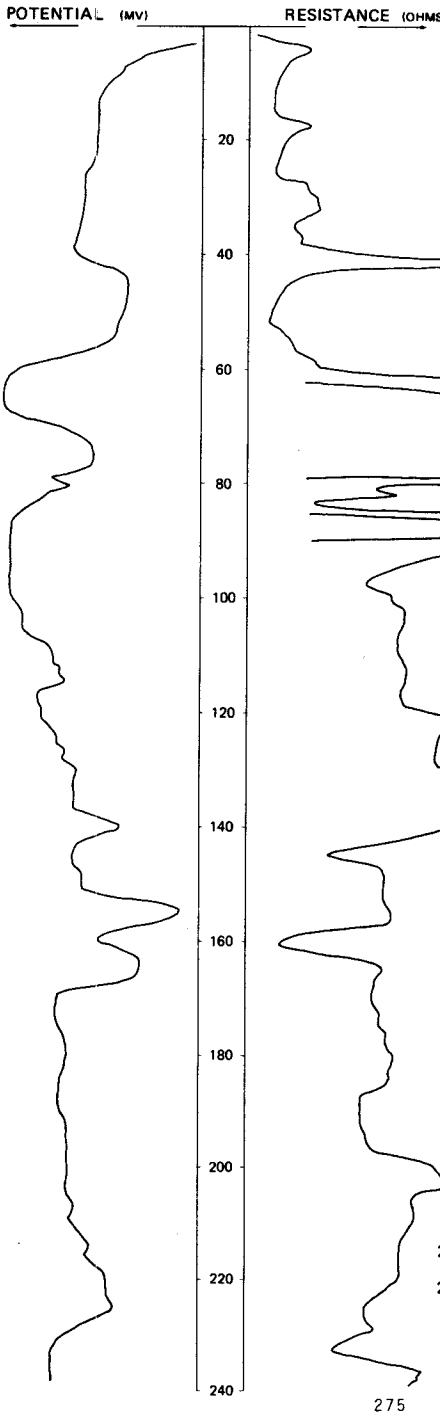
NDSWC 10066

LOCATION: 154-079-24DDD

DATE DRILLED: 11/09/77

ALTITUDE: (FT, NGVD) 1575

DEPTH: (FT) 280



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

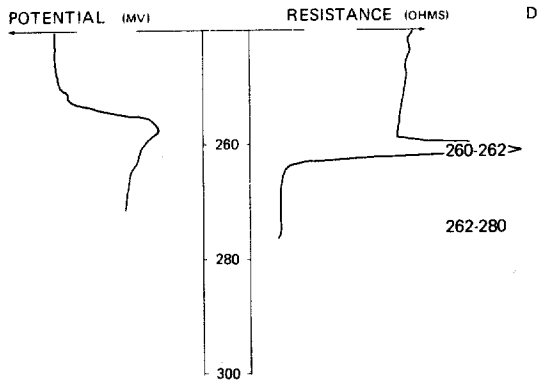
0-1	Topsoil, brownish-black.
1-60	Till, yellowish-brown, silty, sandy; medium gravel from 38 to 42 feet.
60-90	Gravel, fine to medium, subangular to subrounded; dark-gray till from 80 to 84 feet.
90-99	Till,— dark-gray, sandy; detrital lignite fragments.
99-143	Sand, fine, rounded; about 30 percent detrital lignite from 120 to 140 feet.
143-146	Till, dark-gray, sandy.
146-157	Sand, fine to medium, subrounded, lignitic.
157-162	Till, dark-gray, silty, pebbly.
162-228	Sand, medium to coarse; gravelly from 198 to 222 feet; abundant detrital lignite.
228-234	Till, dark-gray, sandy, pebbly.
234-260	Sand, medium, subrounded; about 20 percent detrital lignite.

LOCATION: 154-079-24DDD

DATE DRILLED: 11/09/77

ALTITUDE: (FT, NGVD) 1575

DEPTH: (FT) 280



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

260-262 Cobbles and boulders.

HELL CREEK FORMATION

262-280 Shale, brownish-gray, moderately carbonaceous, fissile, slightly indurated.

154-079-26BBC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1558 feet

Date drilled: 8/15/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift.			
	Topsoil	1	1
	Till, gray to buff, silty sand with fine gravel	4	5
	Sand, brown, fairly well graded	.5	5.5
	Till, brown, silty; becoming gray at 10 feet; very sandy from 6 to 8 and 13 to 25 feet; occasional gravels; rock zone from 22 to 25 feet, oxidized to 10 feet	22	27.5
Cannonball Member:			
	Shale, gray, silty, thin very fine sand seams	12.5	40

154-079-26DCC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1562 feet

Date drilled: 8/12/55

Glacial drift:			
	Topsoil	1	1
	Till, buff, silty, sandy, with gray zone from 14.7 to 15 feet; occasional fine to coarse gravel	15	16
	Sand and gravel, buff, silty; fairly well graded sand, trace of clay, gravel content increases from 25 to 30 feet; cobbles from 25 to 28 feet	14	30

154-079-27AAA
NDSWC 10070

Altitude: 1545 feet — Date drilled: 11/15/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy, oxidized	7	8
	Till, dark-gray, sandy	4	12
	Clay, grayish-black, silty, sandy	20	32
Cannonball Member:			
	Shale, dark-gray, fissile	18	50
	Sandstone, light-greenish-gray, fine, silty, moderately indurated	10	60

154-079-29ABA
NDSWC 10069

Altitude: 1565 feet — Date drilled: 11/14/77

Glacial drift:			
	Topsoil, brown, gravelly	1	1
	Till, yellowish-brown to dark-gray, silty, oxidized to 22 feet	36	37
	Gravel, fine to medium, predominantly medium, sandy, subrounded to rounded	5	42
	Sand, fine to very coarse, clayey; abundant detrital lignite; silty clay lens from 48 to 50 feet	16	58
	Clay, dark-gray, silty, sandy	10	68
	Clay, dark-gray, silty; abundant detrital lignite	9	77
	Sand, fine to coarse, silty, subrounded to rounded; abundant detrital lignite	32	109
Cannonball Member:			
	Shale, grayish-brown, carbonaceous, fissile	9	118
	Sandstone, grayish-blue-green, very fine to fine, semiconsolidated	16	134
	Shale, light-gray; interbedded with dark-gray siltstone; carbonaceous streaks	6	140

154-079-30AAC
(Log from Donald & Keith Erck Well Drilling, Inc.)

Date drilled: 2/01/74

Black dirt	1.5	1.5
Yellow clay	108.5	110
Blue clay	7	117
Blue sand; with very dirty water	19	136
Blue clay	44	180
Hardpan	3	183
Blue clay	15	198
Blue sand	60	258

154-079-36CAC
(Log modified from Nick Erck Well Drilling)

Date drilled 5/26/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black topsoil	2	2
	Yellow clay	33	35
	Gray clay	41	76
	Sand	41	117

154-080-02CCC
NDSWC 1383

Altitude: 1560 feet — Date drilled: 9/11/58

Glacial drift:			
	Clay, yellowish-brown, sandy, oxidized	2	2
	Till, yellowish-brown, with thin lenses of fine to medium gravel; oxidized	29	31
	Till, dark-gray, gravelly	23	54
Cannonball Member:			
	Shale, brownish-gray, sandy, fissile	9	63

154-080-04ABB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1560 feet — Date drilled: 8/23/55

Glacial drift:			
	Till, buff, silty, sandy; becoming gray at 20 feet, few fine gravels throughout; occasional lignite fragments; sandy lens at 8 feet; occasional sandy zones from 20 to 30 feet, oxidized to 20 feet	30	30

154-080-09AAB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1574 feet — Date drilled: 8/22/55

Glacial drift:			
	Topsoil	0.4	0.4
	Till, buff, silty, sandy; becoming gray at 25.4 feet, fine to medium gravel throughout; occasional lignite fragments; sandy gravelly zone at 32 feet, oxidized to 25.4 feet	34.6	35
	Sand, gray, silty, gravelly; occasional clay zone	5	40
	Till, gray; fine gravel throughout; occasional sandy zones	10	50

154-080-11CBB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1569 feet	Date drilled:	8/22/55
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Silt, tan, sandy	5	5
	Till, tan and buff, silty, sandy; some fine to medium gravel throughout; occasional lignite fragments; becomes silty and sandy from 14.8 to 18.5 feet	13.5	18.5
	Sand, tan, fine and medium; becoming brown at 26 feet and gray at 30 feet; trace of silt and clay; approximately 20 percent gravel, occasional lignite slack zones; oxidized to 30 feet	21.5	40

154-080-11CCB
(Log from North Dakota Geological Survey)

Altitude:	1577 feet	Date drilled:	7/21/70
	Gravel, sandy	4	4
	Till, olive-gray to brown	8	12
	Sand and possibly till; olive brown	2	14
	Sand, coarse, clayey, wet	7	21
	Till, sandy	3	24
	Sand, wet, and till	5	29
	Till, very sandy	5	34

154-080-13BBB
(Log modified from U.S. Bureau of Reclamation)

Altitude:	1565 feet	Date drilled:	8/19/55
Glacial drift:			
	Topsoil	0.8	0.8
	Till, buff, silty, sandy; becoming gray at 15.6 feet; some fine gravel throughout; oxidized to 15.6 feet	19.7	20.5
	Sand, gray, silty; fine and medium with few gravels; clay zone at 23.5 feet	9.5	30
	Till, gray; silty sandy zones; fine gravel throughout	5	35
	Sand, gray, fine, silty; two 0.5 foot hard gray till zones	5	40

154-080-13BCC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1566 feet — Date drilled: 8/18/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	0.6	0.6
	Till, tan to buff, silty, sandy; some fine gravel	4.4	5
	Sand, brown, silty, clayey, approximately 10 percent fine gravel in lower portion	13	18
	Till, buff, silty, sandy; few fine gravels; oxidized to 20 feet	2	20
	Till, gray, silty, stiff, impervious; few sandy gravels	1	21
	Sand, gray, fine, silty; occasional gravel	5	26
	Till, gray, silty, stiff, impervious	5	31
	Sand, light-gray; silty streaks; approximately 10 percent fine and medium gravel	1	32
	Sand, gray, fine, uniform, silty	8	40

154-080-14BBB
NDSWC 5831

Altitude: 1572 feet — Date drilled: 9/24/70

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Till, yellowish-brown, sandy, oxidized	14	15
	Till, olive-gray, sandy; some cobbles	11	26
	Gravel, fine to coarse, sandy, angular to subrounded	2	28
	Till, dark-gray, silty, pebbly; some cobbles	30	58
	Sand, fine to coarse, subangular	3	61
	Till, dark-gray, silty, pebbly	6	67
Cannonball Member:			
	Shale, dark-gray, silty, moderately indurated	33	100

154-080-15DDD
NDSWC 1385

Altitude: 1580 feet — Date drilled: 9/11/58

Glacial drift:			
	Topsoil, black	1	1
	Till, yellowish-brown, gravelly, oxidized	29	30
	Till, dark-gray, gravelly	33	63
	Till, dark-gray; about 10 percent fine gravel	14	77
Cannonball Member:			
	Shale, dark-gray, sandy	7	84

154-080-20BBB
NDSWC 5839

Altitude: 1600 feet — Date drilled: 9/25/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift.			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, pebbly, oxidized	12	13
	Gravel, fine to coarse, very sandy, angular to subrounded, oxidized	3	16
	Till, yellowish-brown, sandy, pebbly, oxidized	21	37
	Sand, fine to medium, subangular, oxidized	3	40
	Till, yellowish-brown, sandy, oxidized	1	41
	Sand, fine to coarse, silty, clayey, oxidized	3	44
	Till, yellowish-brown, pebbly, oxidized	13	57
	Till, dark-gray, pebbly; occasional cobbles	14	71
	Sand, fine to medium, silty, subangular to rounded	6	77
	Till, olive-gray, pebbly	5	82
	Clay, dark-gray, very silty; light-gray laminations	19	101
	Sand, very fine to medium, subangular to rounded; abundant detrital lignite	6	107
	Clay, dark-olive-gray, very silty	4	111
	Sand, fine to medium, very clayey, subangular to rounded	29	140
	Sand, fine to very coarse, gravelly, subangular to well-rounded; gravel content increasing with depth	30	170
	Gravel, fine to coarse, sandy, angular to well-rounded; occasional thin lens of silty clay	54	224
	Sand, very fine to very coarse, subangular to rounded; some detrital lignite	11	235
	Gravel, fine to coarse, sandy, angular to rounded, fairly sorted	28	263
	Cobbles and boulders; with some clay	7	270
Hell Creek Formation:			
	Sandstone, greenish-gray to brownish-gray, fine, clayey, indurated; carbonaceous streaks	10	280

154-080-22ADD
NDSWC 5832

Altitude: 1590 feet — Date drilled: 9/24/70

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Till, yellowish-brown, pebbly, oxidized	22	23
	Till, olive-gray, silty, pebbly; occasional cobbles	15	38
	Sand, fine to coarse, subangular, poorly sorted	3	41
	Till, olive-gray, silty, pebbly; some cobbles and boulders	8	49
	Boulder, bluish-gray, sandstone, indurated	3	52
	Till, dark-gray, silty, sandy, pebbly	9	61
Cannonball Member:			
	Sandstone, greenish-gray, fine, clayey, micaceous, consolidated; interbedded with thin lenses of dark-gray fissile shale	39	100

154-080-23CCC
NDSWC 5840

Altitude: 1605 feet — Date drilled: 9/28/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy, pebbly, oxidized	23	24
	Sand, fine to medium, silty, subangular to rounded, oxidized	3	27
	Till, yellowish-brown, sandy, pebbly, oxidized	18	45
	Till, olive-gray, silty; some cobbles	9	54
	Sand, fine to coarse, subangular to rounded; boulder at 56 feet	3	57
	Gravel, fine to coarse, sandy, angular to subrounded	3	60
	Till, olive-gray, silty	2	62
	Sand, fine to very coarse, subrounded	3	65
	Till, olive-gray, silty	21	86
	Sand, fine to coarse, clayey, subangular	3	89
	Clay, dark-gray, very silty	21	110
	Sand, very fine to medium, clayey, subangular	4	114
	Clay, dark-olive-gray, very silty, mottled	4	118
	Sand, very fine to medium, clayey to silty	2	120
	Clay, dark-gray, very silty; interbedded with thin lenses of fine sand	18	138
	Sand, very fine to very coarse, gravelly, slightly clayey, subangular to rounded	42	180
	Gravel, fine to coarse, sandy, angular to well-rounded; abundant carbonates	110	290
Cannonball Member:			
	Sandstone, greenish-gray, very fine, micaceous, calcareous, indurated	10	300

154-080-24DAA
NDSWC 5320

Altitude: 1593 feet — Date drilled: 5/30/78

Glacial drift:			
	Till, yellowish-brown, silty, pebbly; sand lens from 31 to 33 feet	36	36
	Till, dark-olive-gray, sandy	8	44
	Gravel, fine to medium, angular to subrounded	6	50
	Till, olive-gray, sandy	4	54
	Sand, fine to coarse, gravelly, subrounded to rounded	12	66
	Till, dark-olive-gray, silty, interbedded with an occasional thin lens of sand and gravel	139	205
	Sand, very fine to fine, silty, subrounded; detrital lignite	14	219
	Sand, fine to coarse, gravelly, subangular to subrounded; abundant detrital lignite	101	320
	Gravel, fine to very coarse, subrounded; cobbles and boulders	6	326
Hell Creek Formation:			
	Sandstone, dark-gray, very fine, clayey; interbedded with brownish-black carbonaceous shale	4	330

154-080-26BBB
NDSWC 1387

Altitude: 1606 feet — Date drilled: 9/12/58

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, black	1	1
	Till, yellowish-brown, gravelly, oxidized	15	16
	Till, dark-gray, gravelly	27	43
	Clay, gray, sandy	10	53

154-080-26CCC
NDSWC 1384

Altitude: 1615 feet — Date drilled: 9/11/58

Glacial drift.			
	Topsoil, black	1	1
	Till, yellowish-brown, gravelly	27	28
	Gravel, fine to medium, subangular	2	30
	Till, dark-gray, gravelly	6	36
	Sand, coarse; about 30 percent fine gravel; subrounded	9	45
	Till, dark-gray, gravelly; occasional thin lens of fine to medium subrounded gravel	63	108
Cannonball Member:			
	Shale, dark-gray, sandy	8	116

154-080-32BBB
NDSWC 5837

Altitude: 1630 feet — Date drilled: 9/25/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, pebbly, oxidized	32	33
	Till, olive-gray, silty, pebbly, occasional cobbles	9	42
	Sand, fine to very coarse, subangular	7	49
	Till, dark-gray, silty, sandy, some cobbles	33	82
	Sand, fine to very coarse, gravelly, subangular to subrounded	3	85
	Till, yellowish-brown, very sandy, oxidized; cobbles	9	94
	Till, dark-gray, very sandy, pebbly	6	100
Cannonball Member:			
	Shale, medium-gray, sandy, fissile, moderately indurated	20	120

154-080-34ADD
NDSWC 5833

Altitude: 1603 feet — Date drilled: 9/24/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy, oxidized	21	22
	Till, olive-gray, silty, pebbly; some cobbles	33	55
Cannonball Member:			
	Shale, medium-bluish-gray, silty, interbedded with thin lenses of dark-gray fine indurated sandstone	25	80

155-075-03ADD
(Log modified from Nick Erck Well Drilling)

Date drilled: 8/28/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black topsoil	2	2
	Sand	6	8
	Yellow clay	24	32
	Blue clay	24	56
	Sand; water	5	61

155-075-04BBB
NDSWC 10033

Altitude: 1505 feet — Date drilled: 10/27/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Silt, yellowish-brown, clayey, oxidized	7	8
	Silt, dark-gray, clayey; laminations	23	31
	Till, dark-gray, sandy; some cobbles and boulders; medium gravel from 40 to 41 feet	22	53
Fox Hills Sandstone:			
	Sandstone, light-grayish-green, fine to medium, slightly clayey, semiconsolidated	18	71
	Shale, grayish-brown to black, carbonaceous to lignitic	9	80

155-075-12BBB
NDSWC 10034

Altitude: 1530 feet — Date drilled: 10/28/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, dark-brown, fine, silty, subangular, oxidized	3	4
	Clay, yellowish-brown, silty, oxidized, mottled	6	10
	Clay, medium-gray, silty	8	18
	Silt, dark-gray, clayey	3	21
	Till, dark-gray, sandy	35	56
Fox Hills Sandstone:			
	Shale, brownish-gray, silty, carbonaceous	26	82
	Sandstone, greenish-gray, fine, clayey	18	100

155-075-14CDD
(Log modified from North Dakota Geological Survey)

Altitude: 1575 feet — Date drilled: 7/20/70

	Till	1	1
	Sand, fine, very poorly sorted; abundant very coarse material; a few pebbles	3	4
	Sand, fine to coarse; a few pebbles	5	9
	Silt to very fine sand; well sorted	5	14
	Sand, very fine, well-sorted	30	44
	Sand, brown, very fine, silty	5	49
	Sand, bluish-gray to olive-gray, very fine, silty	10	59
	Silt, olive-gray, very fine, sandy	10	69
	Sand, olive-gray, very fine to silt; wet	3	72
	Sand, olive-gray, to dry silt	2	74

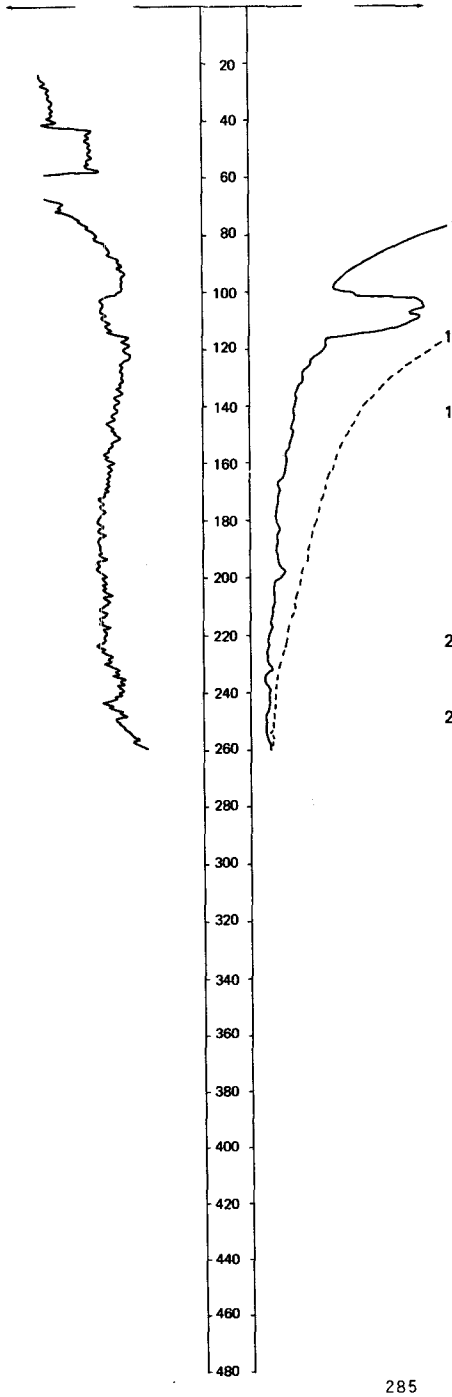
NDSWC 4987

LOCATION: 155-075-15BBB

DATE DRILLED: 9/22/76

ALTITUDE: 1515
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-15 Sand, very fine to coarse, sub-angular to subrounded; oxidized to 10 feet.

15-65 Till, dark-olive-gray, silty, sandy.

FOX HILLS SANDSTONE

65-69 Sandstone, grayish-green, very fine to fine, glauconitic.

69-101 Siltstone, dark-gray, sandy, partially indurated.

101-115 Sandstone, grayish-green, very fine to fine, glauconitic, semi-consolidated; abundant biotite.

115-220 Siltstone, light-gray to brownish-gray, fine to medium; interbedded with lenses of greenish-gray glauconitic sandstone; some carbonaceous streaks.

220-233 Shale, brownish-gray, bentonitic.

PIERRE SHALE

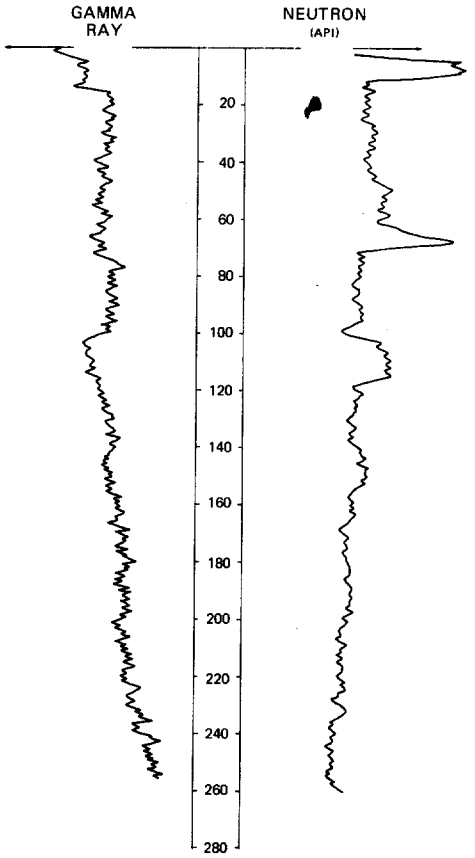
233-260 Shale, black, siliceous, brittle; occasional very thin lenses of bentonite.

LOCATION: 155-075-15BBB

DATE DRILLED: 9/22/76

ALTITUDE: 1515
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

155-075-21AAA
NDSWC 4988

Altitude: 1505 feet

Date drilled: 9/23/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, predominantly medium, subangular to rounded; oxidized to 7 feet	22	22
	Till, olive-gray, silty, pebbly	33	55
	Sand, medium to very coarse; about 40 percent fine to medium gravel; subangular to subrounded	7	62
	Till, dark-gray, sandy	3	65
Fox Hills Sandstone:			
	Siltstone, medium-gray, slightly indurated	35	100
	Siltstone, greenish-gray; interbedded with dark-green fine to medium clayey glauconitic sandstone	30	130

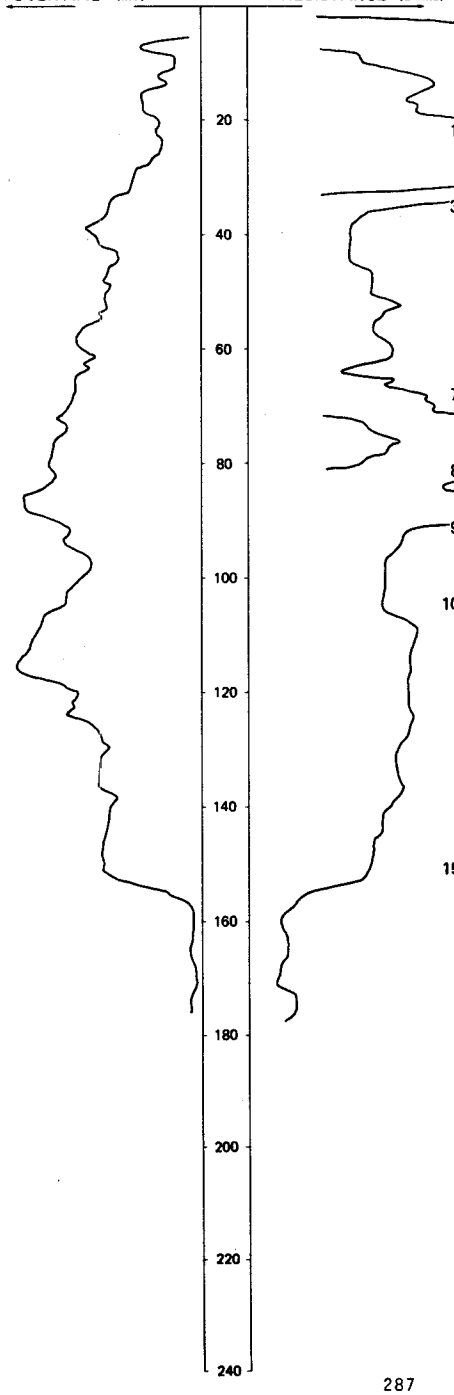
NDSWC 10179

LOCATION: 155-075-27CCB

DATE DRILLED: 8/08/78

ALTITUDE: 1514 (FT, NGVD)

DEPTH: 180 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-19 Sand, very fine to fine, silty, subrounded, oxidized.

19-34 Sand, medium to very coarse; about 25 percent fine gravel; subrounded to rounded.

34-71 Clay, dark-brownish-gray; about 20 percent dark-gray sandy carbonaceous silt.

71-83 Gravel, fine; about 40 percent coarse to very coarse sand; sub-angular to rounded.

83-92 Till, dark-brownish-gray, silty, sandy.

92-107 Till, dark-gray; cobbles and boulders.

107-154 Clay, dark-brownish-gray, silty, sandy; detrital lignite.

FOX HILLS SANDSTONE

154-180 Siltstone, dark-grayish-brown, clayey, slightly indurated; carbonaceous streaks.

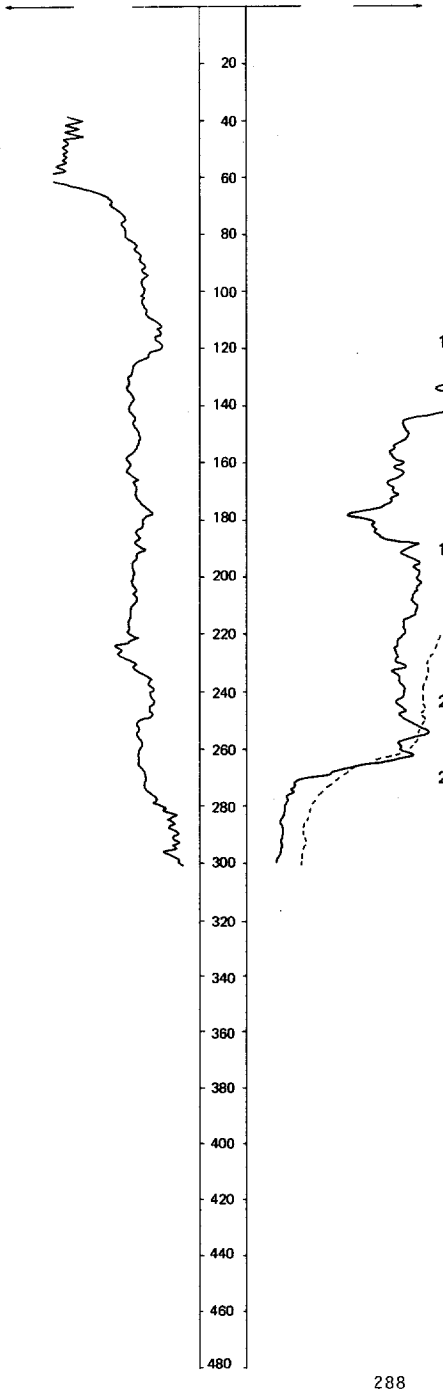
NDSWC 4989

LOCATION: 155-075-28AAA

DATE DRILLED: 9/23/76

ALTITUDE: 1510
(FT, NGVD)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-10	Sand, fine to coarse, predominantly medium, subangular to rounded, oxidized.
10-62	Sand, fine to coarse, predominantly medium; about 20 percent fine gravel; subangular to rounded.
62-90	Silt, medium-gray, silty, sandy.
90-120	Till, dark-gray, sandy.
120-188	Clay, dark-gray, silty, sandy.
188-244	Till, olive-gray, silty, sandy.
244-268	Till, dark-gray, sandy, very gravelly.

PIERRE SHALE

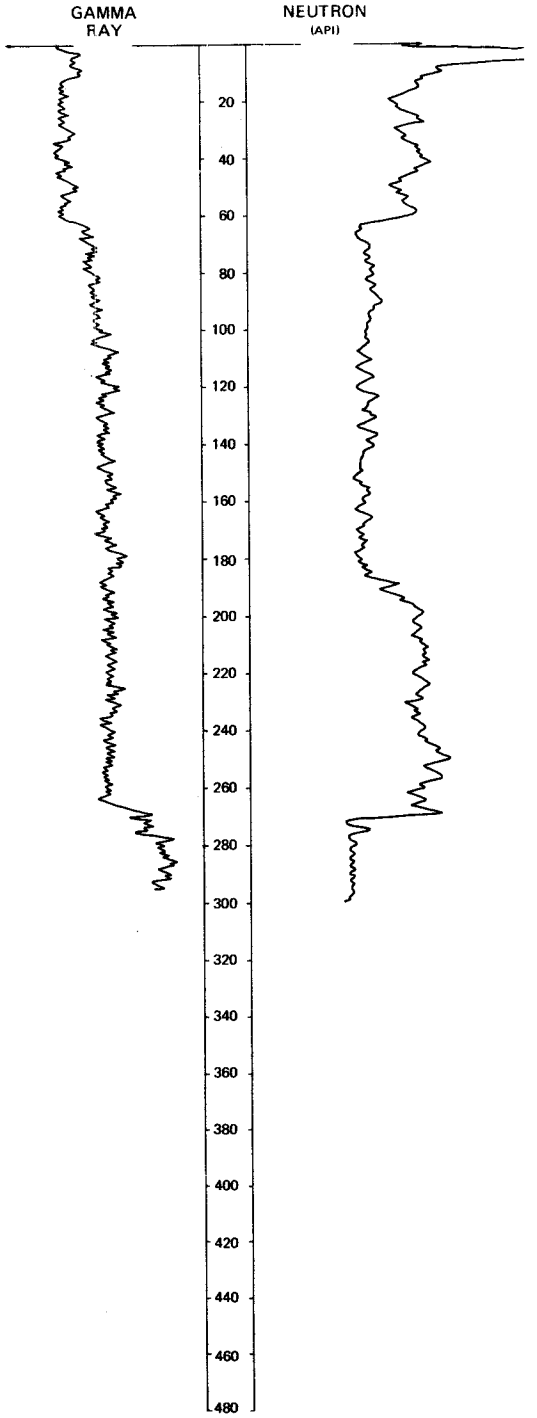
268-300	Shale, black, siliceous, indurated.

LOCATION: 155-075-28AAA

DATE DRILLED: 9/23/76

ALTITUDE: 1510
(FT, NGVD)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

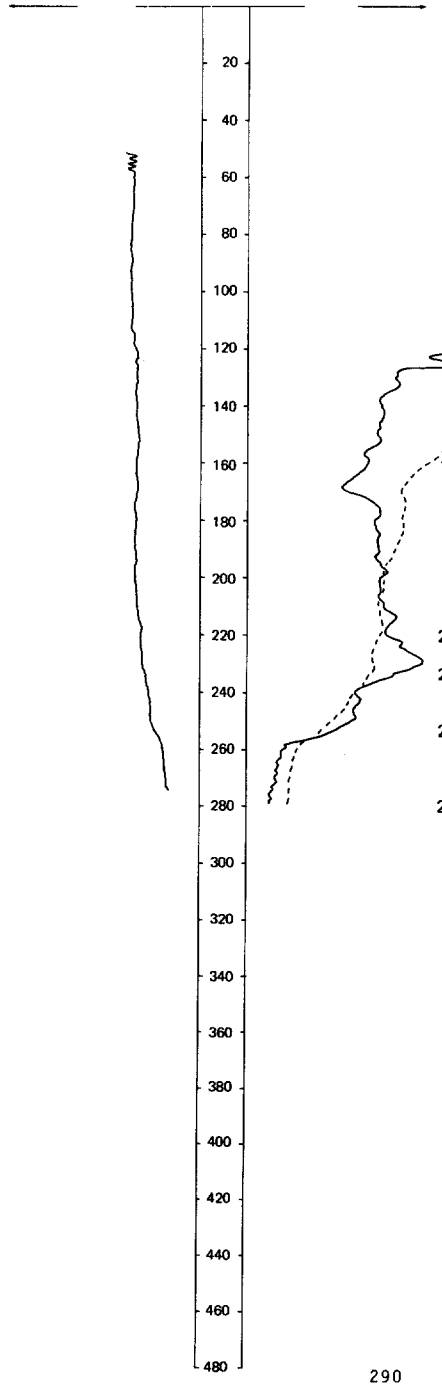
NDSWC 4990

LOCATION: 155-075-28ABB

DATE DRILLED: 9/23/76

ALTITUDE: 1512
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-72	Sand, very fine to coarse, predominantly medium, gravelly, subrounded to rounded; oxidized to 10 feet.
72-106	Sand, fine to very coarse, predominantly medium, subangular to rounded, slightly lignitic.
106-165	Silt, medium-gray, sandy; abundant detrital lignite at 150 feet.
165-222	Till, olive-gray, very silty, sandy.
222-227	Till, dark-gray, silty, sandy.
227-233	Gravel, fine to medium, sandy, rounded.
233-257	Till, dark-gray, sandy, pebbly.

PIERRE SHALE

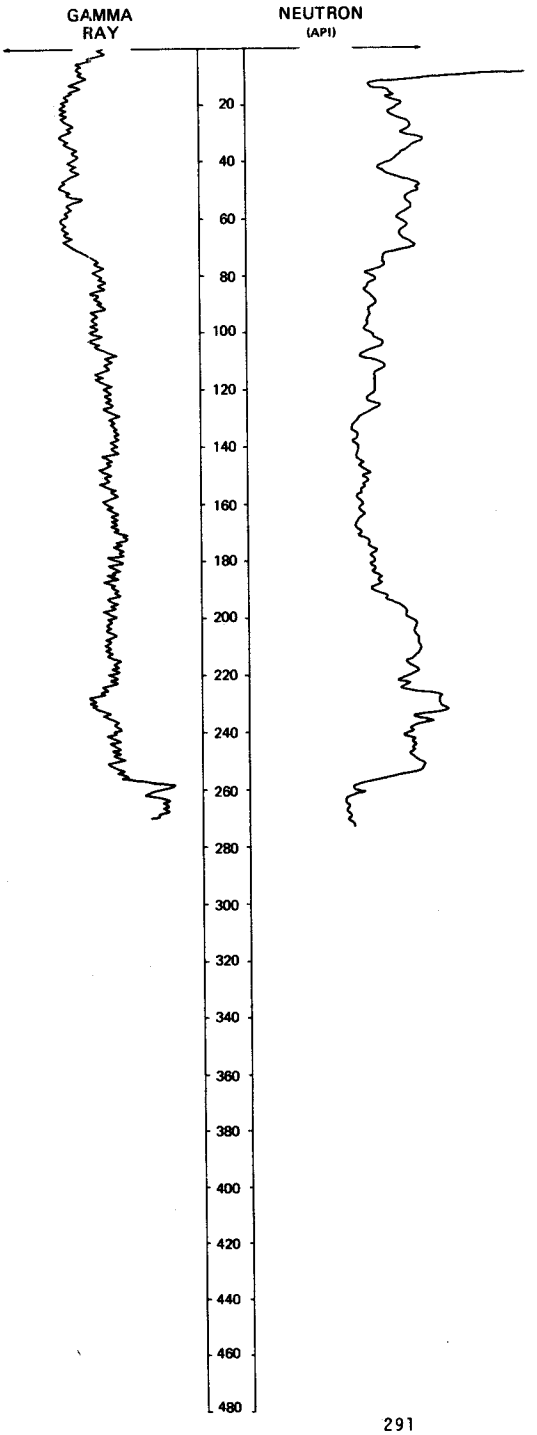
257-280	Shale, black, siliceous, moderately indurated; thin lenses of bentonite.

LOCATION: 155-075-28ABB

DATE DRILLED: 9/23/76

ALTITUDE: 1512
(FT, NGVD)

DEPTH: 280
(FT)



DESCRIPTION OF DEPOSITS

155-076-02CCC
NDSWC 9573

Altitude: 1510 feet — Date drilled: 5/26/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to medium, subrounded; mostly quartz	43	43
	Clay, greenish-gray, silty, cohesive	113	156
	Till, dark-gray, silty	38	194
	Till, dark-gray, sandy, gravelly	34	228
	Gravel, fine, sandy, angular to rounded	6	234
	Till, dark-gray, very gravelly	8	242
Fox Hills Sandstone:			
	Shale, dark-brown, carbonaceous, slightly indurated	18	260

155-076-04BBB
NDSWC 10030

Altitude: 1455 feet — Date drilled: 10/27/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized	8	9
	Clay, dark-gray, silty; abundant fossil fragments	9	18
	Sand, fine, subrounded, well-graded	11	29
	Silt, dark-brownish-gray, silty	39	68
	Till, dark-gray, silty	51	119
Fox Hills Sandstone:			
	Sandstone, light-greenish-gray, fine to medium, clayey, glauconitic	5	124
	Shale, brownish-gray, moderately carbonaceous, fissile	16	140

155-076-05A
(Log from North Star Well Drilling)

Date drilled: 3/18/76

Brown sand	8	8
Fine gray sand	10	18
Gray clay	62	80

155-076-05AA
(Log from North Star Well Drilling)

Date drilled: 3/18/76

Brown sand	9	9
Gray sand	14	23
Gray clay	12	35

155-076-05D
(Log from North Star Well Drilling)

Date drilled: 3/18/76

Coarse gravel, streaks of fine sand	18	18
Blue clay	82	100

155-076-05DC
(Log from North Star Well Drilling)

Date drilled: 3/18/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Blue clay	5	5
	Coarse gravel	10	15
	Blue clay	35	50

155-076-10BBA1, 2
NDSWC 9379, 9379A

Altitude: 1502 feet — Date drilled: 8/04/75

Glacial drift:			
	Sand, fine to coarse, predominantly medium, angular to subrounded; oxidized to 10 feet	20	20
	Clay, medium-gray, silty, sandy	6	26
	Sand, fine to coarse, predominantly medium, subrounded to rounded	11	37
	Clay, medium-gray, very silty, slightly sandy	79	116
	Till, dark-gray, sandy, pebbly	36	152
Fox Hills Sandstone:			
	Shale, dark-brownish-gray, partially carbonaceous, moderately indurated	17	169
	Siltstone, greenish-gray to light-gray, clayey, sandy	31	200

155-076-10CCC
NDSWC 9380

Altitude: 1510 feet — Date drilled: 8/04/75

Glacial drift:			
	Sand, fine to coarse, predominantly medium, angular to subrounded; oxidized to 11 feet	28	28
	Clay, medium-gray, very silty, moderately sandy	18	46
	Sand, fine to coarse, predominantly medium, angular to subrounded	5	51
	Clay, medium-gray, very silty	43	94
	Till, dark-gray, silty, sandy	30	124
Fox Hills Sandstone:			
	Shale, medium-gray to brownish-black, silty, partially carbonaceous, brittle	16	140

155-076-21AAA
NDSWC 5856

Altitude: 1510 feet — Date drilled: 10/13/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, very fine to coarse, subangular to rounded	36	37
	Gravel, fine to coarse, sandy, angular to subrounded	3	40
	Till, olive-gray, silty, pebbly; some cobbles	42	82
Fox Hills Sandstone:			
	Shale, brownish-gray; interbedded with bluish-gray medium moderately indurated sandstone	18	100

155-076-28BBB
NDSWC 9381

Altitude:	1510 feet	Date drilled:	8/04/75
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to very coarse, predominantly medium, angular to subrounded; oxidized to 10 feet	20	20
	Sand, fine to very coarse, predominantly medium; about 30 percent fine to coarse gravel; angular to subrounded	11	31
	Till, dark-gray, sandy, pebbly	25	56
Fox Hills Sandstone:			
	Shale, medium-gray to brownish-black, silty, partially carbonaceous, moderately indurated	24	80

155-076-29DDD
NDSWC 9574

Altitude:	1505 feet	Date drilled:	5/26/76
Glacial drift:			
	Sand, medium to coarse, predominantly medium, rounded; oxidized to 8 feet	22	22
	Till, olive-gray, silty, sandy	34	56
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine, glauconitic, micaceous, moderately indurated	19	75
	Shale, brown; grading to grayish-brown partially carbonaceous siltstone	25	100

155-076-33CCC
NDSWC 10029

Altitude:	1505 feet	Date drilled:	10/27/77
Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, fine to medium, rounded, oxidized	7	8
	Sand, fine to medium, rounded	16	24
	Till, dark-gray, silty; cobbles from 47 to 49 feet	27	51
Fox Hills Sandstone:			
	Sandstone, light-greenish-gray, fine to medium, silty, slightly indurated	9	60

155-077-04CBC
NDSWC 9572

Altitude:	1515 feet	Date drilled:	5/26/76
Glacial drift:			
	Sand, coarse to very coarse, gravelly, subrounded to rounded	31	31
	Till, olive-gray, silty, sandy	20	51
	Till, dark-gray, sandy, gravelly	17	68
Fox Hills Sandstone:			
	Sandstone, pale-greenish-gray, fine, bentonitic, slightly indurated	12	80
	Sandstone, dark-greenish-gray, fine, moderately indurated	20	100

155-077-12CAD
(Log modified from Schnell Inc.)

Date drilled: 11/26/63

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Brown clay	11	13
	Blue clay	7	20
	Fine sand	32	52
	Clay (Fort Union)	2	54

155-077-12CBD
(Log modified from Schnell Inc.)

Date drilled: 11/27/63

	Sand	21	21
	Gray till	15	36
	Sand	1	37
	Gray till	21	58
	Sand	2	60
	Sandy clay	34	94
Fort Union Formation:			
	Shale; clay	46	140

155-077-13CCC
(Log modified from Schnell Inc.)

Date drilled: 11/27/63

	Topsoil	2	2
	Clay	34	36
	Very fine sand	12	48
	Medium sand	1	49
	Clay (Fort Union)	6	55

155-077-13CCD
(Log from Schnell Inc.)

Date drilled: 11/27/63

	Topsoil	3	3
	Clay	28	31
	Sand	9	40
	Clay (Fort Union)	10	50

155-077-17AAA
NDSWC 5857

Altitude: 1520 feet — Date drilled: 10/13/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, very fine to very coarse, subangular to rounded, oxidized	19	20
	Gravel, fine to medium, sandy, angular to well-rounded	8	28
	Till, olive-gray, silty, pebbly	5	33
	Gravel, fine to coarse, angular to well-rounded	11	44
	Till, olive-gray, silty; occasional thin lenses of sand and gravel; some cobbles	44	88
Fox Hills Sandstone:			
	Shale, light-gray, sandy, micaceous, bentonitic, moderately indurated	12	100

155-077-24BDC
(Log from Stemen Drilling Co.)

Date drilled: 11/08/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	4	4
	Brown sand	11	15
	Gray clay; mixed with gravel	35	50
	Gray sand and water	5	55
	Gray clay	22	77
	Gray sandstone	2	79
	Gray clay	10	89
	Gray sandstone	1	90

155-077-24CCC
NDSWC 10059

Altitude: 1460 feet — Date drilled: 11/08/77

Alluvium:			
	Topsoil, brownish-black	1	1
	Silt, yellowish-brown, clayey	11	12
	Gravel, fine to medium, subrounded, oxidized	6	18
	Till, brownish-gray, silty, oxidized	3	21
Fox Hills Sandstone:			
	Sandstone, yellowish-white, fine, silty, unconsolidated, oxidized	10	31
	Sandstone, light-greenish-gray, fine, silty, semiconsolidated; light-green shale from 45 to 46 feet	29	60

155-077-24DCC
(Log modified from North Dakota Geological Survey)

Altitude: 1510 feet — Date drilled: 7/18/70

	Sand	3	3
	Sand, brown, fine to very fine, very well sorted	1	4
	Sand, brown, medium to coarse; a few pebbles	2	6
	Sand, dark-brown, medium, well-sorted	3	9
	Sand, very coarse to gravel; approximately 1 inch diameter pebbles	5	14
	Sand, brown, coarse to very coarse, slightly pebbly	2	16
	Sand, dark-brown, coarse to very coarse, pebbly	3	19
	Sand, dark-brown, very coarse, pebbly to sandy	15	34

155-077-26BAA
NDSWC 10058

Altitude: 1460 feet — Date drilled: 11/08/77

Alluvium:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized	14	15
	Clay, grayish-brown; mottled; gastropod fossil fragments	17	32
	Sand, fine to medium, subrounded; mostly quartz with about 20 percent detrital lignite	41	73
	Sand, medium to coarse, subangular to subrounded	3	76
Fox Hills Sandstone:			
	Sandstone, light-green, fine, silty, moderately indurated	4	80
	Siltstone, grayish-brown, clayey, carbonaceous, moderately indurated	10	90

155-077-27ABD
NDSWC 10057

Altitude: 1465 feet — Date drilled: 11/08/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, sandy, oxidized	14	15
	Clay, dark-gray, silty, sandy; fossil fragments of gastropods	15	30
	Sand, fine, subrounded to rounded; about 30 percent detrital lignite	5	35
	Sand, medium, subangular to subrounded; about 40 percent detrital lignite	15	50
	Sand, medium to coarse, subangular to subrounded; about 50 percent detrital lignite	10	60
	Silt, medium-gray, clayey	10	70
	Boulder	1	71
	Clay, medium-gray; poor return and flowing; possible bedrock at 73 feet	9	80

155-077-28ABC
NDSWC 10056

Altitude: 1515 feet — Date drilled: 11/03/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Gravel, fine to medium, angular to subrounded, oxidized	9	10
	Clay, olive-gray, silty, sandy	11	21
	Clay, greenish-gray, silty	17	38
	Till, dark-gray, sandy	20	58
	Clay, dark-gray, silty, sandy	23	81
	Till, dark-gray, silty	6	87
	Gravel, fine to medium, subrounded	4	91
	Till, dark-gray; interbedded with lenses of coarse gravelly sand	5	96
	Till, dark-gray, sandy	15	111
Fox Hills Sandstone:			
	Sandstone, light-gray, fine, silty, moderately indurated	9	120

155-077-31CCC
NDSWC 10060

Altitude: 1492 feet — Date drilled: 11/08/77

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, fine, rounded, oxidized	3	4
	Till, yellowish-brown, sandy, oxidized	13	17
	Till, dark-gray, silty	15	32
Fox Hills Sandstone:			
	Shale, brownish-gray, carbonaceous	6	38
	Limestone, light-gray, calcareous, indurated	1	39
	Shale, dark-gray, moderately indurated; lignitic at 48 feet	15	54
	Sandstone, grayish-green, fine to medium, silty	6	60

155-078-01BA
(Log modified from Nick Erck Well Drilling)

Date drilled: 6/20/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black topsoil	1	1
	Sand	35	36

155-078-07BBB
NDSWC 10134

Altitude: 1492 feet — Date drilled: 7/19/78

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, very fine to very coarse, subrounded to rounded; oxidized to 6 feet	8	9
	Clay, dark-gray, silty	2	11
	Till, dark-gray, silty	13	24
	Till, dark-gray; with thin lenses of medium sand	5	29
	Till, dark-gray, sandy	12	41
	Sand, fine to medium, subrounded	3	44
	Till, dark-gray, silty	8	52
Fox Hills Sandstone:			
	Sandstone, light-gray, fine, slightly indurated; interbedded with grayish-brown clayey carbonaceous moderately indurated siltstone	28	80

155-078-16DDD
NDSWC 5858

Altitude: 1518 feet — Date drilled: 10/13/70

Glacial drift:			
	Topsoil, brownish-black, very sandy	1	1
	Sand, very fine to very coarse, subangular to rounded; oxidized to 10 feet	19	20
	Till, olive-gray, silty	5	25
	Sand, fine to very coarse, gravelly, subangular to rounded	3	28
	Till, dark-gray, silty, pebbly	48	76
Fox Hills Sandstone:			
	Shale, greenish-brown, carbonaceous; interbedded with thin lenses of greenish-gray fine clayey sandstone; carbonaceous streaks	24	100

155-078-19AAA
NDSWC 5868

Altitude: 1520 feet — Date drilled: 10/15/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, very fine to very coarse, gravelly, subangular to rounded, oxidized	26	27
	Till, olive-gray, silty, pebbly; some cobbles	49	76
Fox Hills Sandstone:			
	Shale, brownish-gray, slightly carbonaceous; interbedded with lenses of greenish-gray medium clayey sandstone; mottled	24	100

155-078-21BBB
NDSWC 10133

Altitude: 1516 feet — Date drilled: 7/19/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to very coarse, silty, subrounded to rounded, oxidized	10	10
	Till, olive-gray, silty, pebbly	20	30
	Sand, fine to medium, subangular	3	33
	Till, dark-gray; interbedded with thin lenses of sand and gravel	27	60
	Till, dark-gray, silty, pebbly	16	76
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine, bentonitic, moderately indurated	4	80

155-078-24BAD
(Log modified from North Dakota Geological Survey)

Altitude: 1570 feet — Date drilled: 7/17/70

Sand, brown, very fine, very well sorted	4	4
Till	11	15
Sand, brown, fine; contains a few pebbles	3	18
Till	20	38
Sand, gray	1	39
Siltstone, sandy	5	44
Sandstone, blue	5	49
Till, sandy	1	50

155-078-29CAC
(Log modified from Midwest Valley)

Date drilled: 10/17/73

Soft sand	10	10
Better sand	6	16
Soft clay	6	22

155-078-29CBA
(Log modified from Midwest Valley)

Date drilled: 10/17/73

Soft sand	10	10
Sand; better than from 0 to 10 feet	4	14
Clean loose sand	2	16
Tighter sand	3	19
Soft clay; with occasional sand lenses	18	37

155-078-29CCC
(Log modified from Midwest Valley)

Date drilled: 10/17/73

Soft sand	15	15
Soft clay	7	22

155-078-29DCD
NDSWC 10132

Altitude:	1510 feet	Date drilled:	7/18/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift.			
	Gravel, fine to medium; with about 40 percent fine to very coarse sand; subrounded to rounded; oxidized to 7 feet	16	16
	Till, dark-gray, sandy, gravelly	34	50
	Till, dark-gray, silty, pebbly	12	62
Hell Creek Formation:			
	Siltstone, dark-brown, carbonaceous; interbedded with light-gray very fine sandstone and thin seams of lignite	18	80

155-078-30DAB
(Log modified from Midwest Valley)

		Date drilled:	10/17/73
	Soft sand	7	7
	Fairly tight gravel	6	13
	Clay	9	22

155-078-30DCA
(Log from Midwest Valley)

		Date drilled:	10/17/73
	Dry gravel and rocks	10	10
	Poor gravel	3	13
	Clay	6	19

155-079-05A
(Log from Russell Drilling Co.)

Altitude:	1505 feet	Date drilled:	1/22/76
	Gravel	11	11
	Till; some gravel	31	42
	Till	12	54
	Bedrock shale	5	59
	Bedrock sand	3	62

155-079-05C
(Log from Russell Drilling Co.)

Altitude:	1510 feet	Date drilled:	2/26/76
	Sand and gravel	11	11
	Till	7	18
	Sand	5	23
	Till	30	53
	Bedrock	9	62

155-079-05D
(Log from Russell Drilling Co.)

Date drilled: 1/22/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Till	4	4
	Gravel	5	9
	Till	14	23
	Bedrock	9	32
	Limestone	1	33
	Bedrock	9	42

155-079-06DDD
NDSWC 10131

Altitude: 1510 feet — Date drilled: 7/18/78

Glacial drift:			
	Gravel, fine to medium; about 30 percent fine to very coarse sand; subangular to rounded; oxidized	12	12
	Till, yellowish-brown, silty, sandy, oxidized	5	17
	Till, olive-gray, sandy to gravelly	15	32
	Till, dark-gray, sandy	18	50
	Till, dark-gray, pebbly	10	60
Fox Hills Sandstone:			
	Siltstone, dark-grayish-brown, carbonaceous, moderately indurated	20	80

155-079-08A
(Log from Russell Drilling Co.)

Altitude. 1519 feet — Date drilled: 1/31/76

Topsoil	2	2
Gravel and sand	17	19
Gravelly till	11	30
Gravel	5	35
Till	24	59
Coal	1	60
Black shale	9	69
Bedrock sand and shale	13	82

155-079-08ADD
(Log from R & F Drilling & Supply)

Date drilled: 7/31/76

Black soil	1	1
Clay	12	13
Blue clay	20	33
Gravel	2	35
Blue clay	10	45
Gravel and sand	5	50
Coarse sand	5	55

155-079-09D
(Log modified from Farmers Supply Company)

Date drilled: 7/26/71

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	3	3
	Yellow clay; with sand and gravel	15	18
	Yellow clay; with coarse gravel	8	26
	Gray clay and medium gravel	7	33
	Coarse sand	5	38
	Gray clay; with fine gravel	2	40
	Blue clay; with coarse sand	20	60
	Blue clay; with gravel strips	25	85
	Blue shaly tough clay	5	90

155-079-10BAB
(Log from Farmers Supply Company)

Altitude: 1505 feet

Date drilled: 7/26/71

	Topsoil	2	2
	Yellow clay; with coarse gravel	8	10
	Blue clay; with fine gravel	25	35
	Blue clay; with coarse gravel	18	53
	Bedrock	1	54

155-079-10C
(Log from Farmers Supply Company)

Date drilled: 7/26/71

	Topsoil	2	2
	Yellow clay; with sand and gravel	13	15
	Blue clay; with gravel	10	25
	Blue clay; with small gravel	10	35
	Blue clay; with coarse gravel	35	70

155-079-19B
(Log modified from Farmers Supply Company)

Date drilled: 7/23/71

	Topsoil	2	2
	Yellow sand and clay; gravel	17	19
	Fine to coarse gravel	11	30
	Medium gravel	35	65
	Coarse gravel	25	90
	Medium gravel	10	100
	Coarse gravel	3	103
	Medium-coarse gravel	45	148
	Fine sand	12	160

155-079-19BA
(Log modified from Midwest Valley)

Date drilled: 6/28/72

	Topsoil	2	2
	Clay	24	26
	Clean well-rounded gravel	5	31
	Gray clay	51	82

155-079-19BAC
(Log modified from Midwest Valley)

Date drilled: 6/28/72

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	2	2
	Gray clay	78	80
	Gravel	1	81
	Gray clay	19	100

155-079-20DDD
NDSWC 10127

Altitude: 1510 feet — Date drilled: 7/12/78

Glacial drift:			
	Sand, very fine to very coarse; about 25 percent fine to medium gravel; subrounded to rounded	22	22
	Till, dark-gray; about 25 percent gravel pebbles; with fine to medium gravel from 59 to 60 and 77 to 79 feet	63	85
	Gravel, fine to medium, sandy, angular to subrounded; interbedded with lenses of silty clay	16	101
Fox Hills Sandstone:			
	Sandstone, brownish-green, very fine, slightly carbonaceous, well-indurated	13	114
	Sandstone, greenish-gray, fine, bentonitic	4	118
	Shale, dark-brown, carbonaceous, moderately indurated	2	120

155-079-21AAA
NDSWC 5867

Altitude: 1505 feet — Date drilled: 10/14/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, fine to very coarse, subangular to rounded, oxidized	9	10
	Till, dark-gray, silty; some cobbles; interbedded with thin lenses of fine to medium gravel	30	40
	Till, dark-gray, silty, pebbly	26	66
Hell Creek Formation:			
	Shale, medium-brownish-gray, calcareous, moderately indurated; carbonaceous along bedding planes	14	80

155-079-23DAD
(Log from R & F Drilling & Supply)

Altitude: 1515 feet — Date drilled: 8/02/76

	Black soil	1	1
	Clay	15	16
	Blue clay; laced with sand	13	29
	Gravel and sand	5	34
	Blue clay; laced with sand	11	45
	Blue clay	83	128
	Blue clay and coal	3	131
	Blue clay	7	138

155-079-29ADA
(Log from Russell Drilling Co.)

Date drilled: 7/20/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand	12	12
	Till	21	33
	Sandy till	9	42
	Sand and gravel	8	50

155-079-29B
(Log from Russell Drilling Co.)

Date drilled: 2/09/76

	Till	18	18
	Gravel and sand	4	22
	Till	4	26
	Sand and gravel	3	29
	Shale	113	142
	White sticky sand	34	176
	Sand and shale layers	21	197
	Limestone	3	200
	Shale	22	222

155-079-29CCC
NDSWC 10126

Altitude: 1522 feet — Date drilled: 7/12/78

Glacial drift:			
	Gravel, fine to medium; about 30 percent very fine to very coarse sand; subangular to rounded; oxidized	6	6
	Till, olive-brown, silty, pebbly, oxidized	4	10
	Till, dark-gray, sandy, pebbly	45	55
	Gravel, fine; about 40 percent very fine to very coarse sand; angular to subrounded	4	59
Hell Creek Formation:			
	Siltstone, brownish-gray, carbonaceous, moderately indurated	11	70
	Sandstone, greenish-gray, fine, clayey, well-indurated	2	72
	Shale, dark-grayish-brown, carbonaceous, moderately indurated	28	100

155-080-09AAA
NDSWC 1391

Altitude: 1530 feet — Date drilled: 9/15/58

Glacial drift:			
	Topsoil, brownish-black	1	1
	Gravel, fine, sandy, oxidized	12	13
	Till, dark-gray, gravelly; abundant shale pebbles	34	47
Cannonball Member(?):			
	Shale, gray, sandy	13	60

155-080-09DAA
NDSWC 10130

Altitude: 1510 feet — Date drilled: 7/18/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Gravel, fine to medium; about 30 percent fine to very coarse sand; subrounded to rounded; oxidized	12	12
	Till, dark-gray, silty, sandy	52	64
	Gravel, fine to medium; about 30 percent medium to very coarse sand; subangular to rounded	6	70
	Till, dark-gray; interbedded with fine to coarse sand; subrounded	8	78
Hell Creek Formation:			
	Siltstone, dark-gray, moderately indurated; carbonaceous streaks	8	86
	Sandstone, grayish-green, very fine, clayey, moderately indurated	4	90
	Siltstone, brownish-gray, sandy, poorly indurated; carbonaceous streaks	10	100

155-080-10ABA
(Log modified from Stemen Drilling Co.)

Date drilled: 4/30/74

Topsoil	1	1
Yellow oxidized clay	28	29
Gravel	4	33
Blue clay	6	39
Sand and gravel	3	42
Blue hard clay	7	49
Sand and gravel	1	50
Blue clay	2	52

155-080-11BBB
NDSWC 10129

Altitude: 1517 feet — Date drilled: 7/13/78

Glacial drift:			
	Sand, very fine to very coarse; about 40 percent fine to coarse gravel; subrounded to rounded; oxidized	16	16
	Till, yellowish-brown, sandy, oxidized	1	17
	Till, dark-gray, sandy, pebbly	8	25
	Gravel, fine to medium, subrounded to rounded, well-sorted	8	33
	Till, dark-gray, silty, sandy	4	37
Hell Creek Formation:			
	Sandstone, brownish-gray, very fine, slightly clayey; interbedded with dark-brown to grayish-brown partially carbonaceous poorly indurated siltstone	23	60

155-080-13AAD
(Log from Farmers Supply Company)

Date drilled: 11/04/76

Sand	8	8
Yellow sandy clay	13	21
Gray clay	11	32
Sand; with clay layers	20	52
Gray clay; dark	70	122

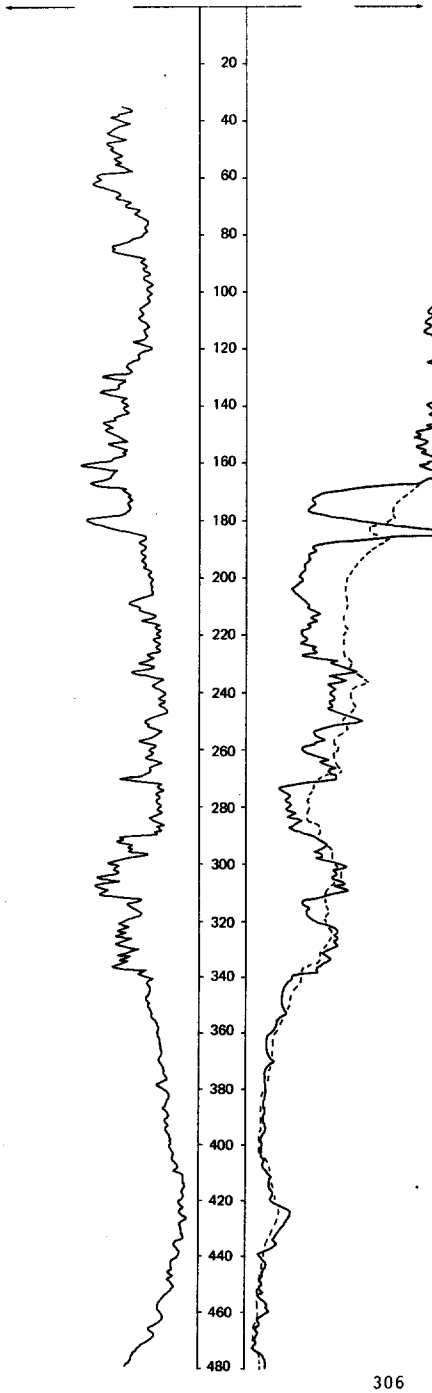
NDSWC 4977

LOCATION: 155-080-15AAA

DATE DRILLED: 9/13/76

ALTITUDE: 1510 (FT, NGVD)

DEPTH: 560 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-21 Till, yellowish-brown, silty, pebbly, oxidized.

21-105 Till, olive-gray, sandy.

105-166 Till, dark-gray, very silty to sandy.

HELL CREEK FORMATION

166-178 Shale, dusky-brown, carbonaceous, slightly indurated.

178-184 Sandstone, greenish-gray, very fine, well-indurated.

184-210 Shale, grayish-brown, partially carbonaceous, moderately indurated.

210-270 Siltstone, greenish-gray, bentonitic; interbedded with greenish-gray very fine clayey sandstone; some thin lenses of brownish-gray carbonaceous shale.

270-288 Shale, brownish-gray, silty, moderately indurated.

FOX HILLS SANDSTONE

288-310 Sandstone, dark-grayish-green, fine to medium, indurated.

310-313 Lignite.

313-338 Sandstone, grayish-green, very fine to fine, poorly indurated; carbonaceous streaks.

338-358 Siltstone, greenish-gray, sandy; some carbonaceous streaks.

358-473 Shale, dark-gray, micaceous, bentonitic; with some sandy intervals.

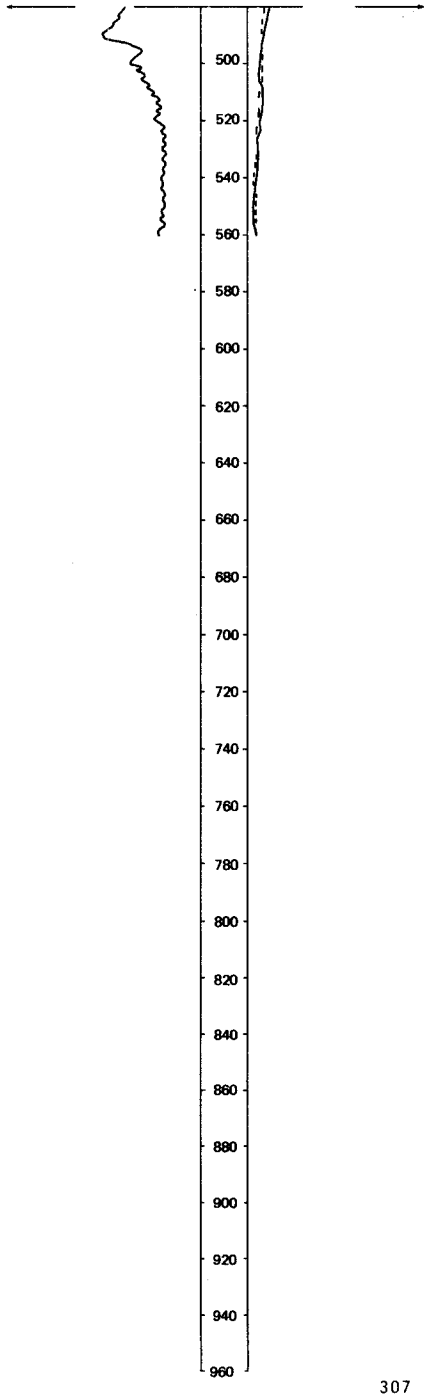
473-490 Sandstone, grayish-green, fine, clayey, moderately indurated.

LOCATION: 155-080-15AAA

DATE DRILLED: 9/13/76

ALTITUDE: 1510 (FT, NGVD)

DEPTH: 560 (FT)



DESCRIPTION OF DEPOSITS

FOX HILLS SANDSTONE, Continued

490-503	Siltstone, brownish-gray, carbonaceous, bentonitic, poorly indurated.
503-522	Shale, greenish-gray, very bentonitic, tight.

PIERRE SHALE

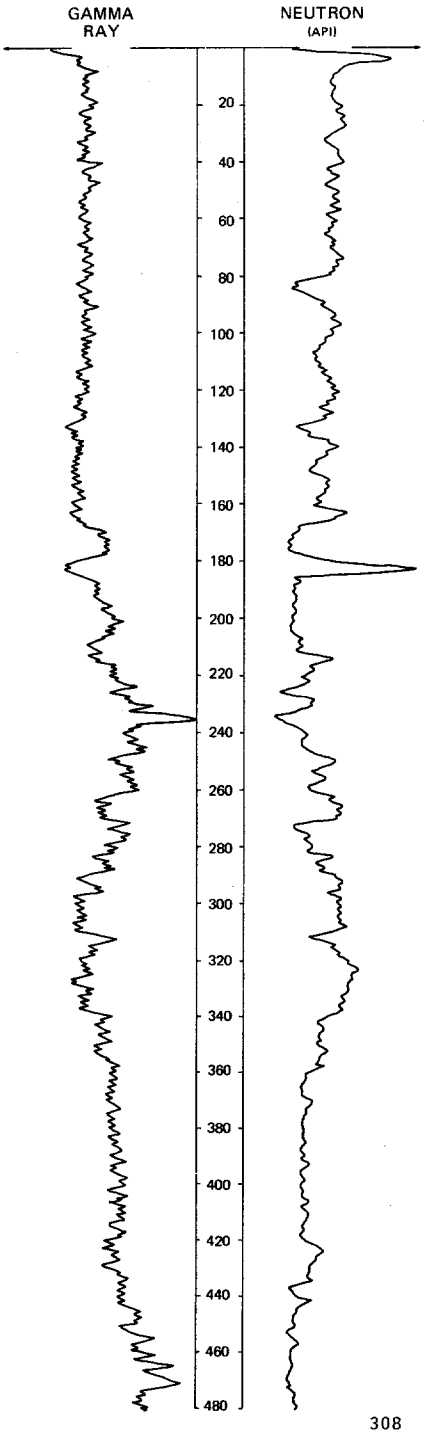
522-560	Shale, grayish-black to black, siliceous, brittle; occasional thin lenses of bentonite.

LOCATION: 155-080-15AAA

DATE DRILLED: 9/13/76

ALTITUDE: 1510
(FT, NGVD)

DEPTH: 560
(FT)



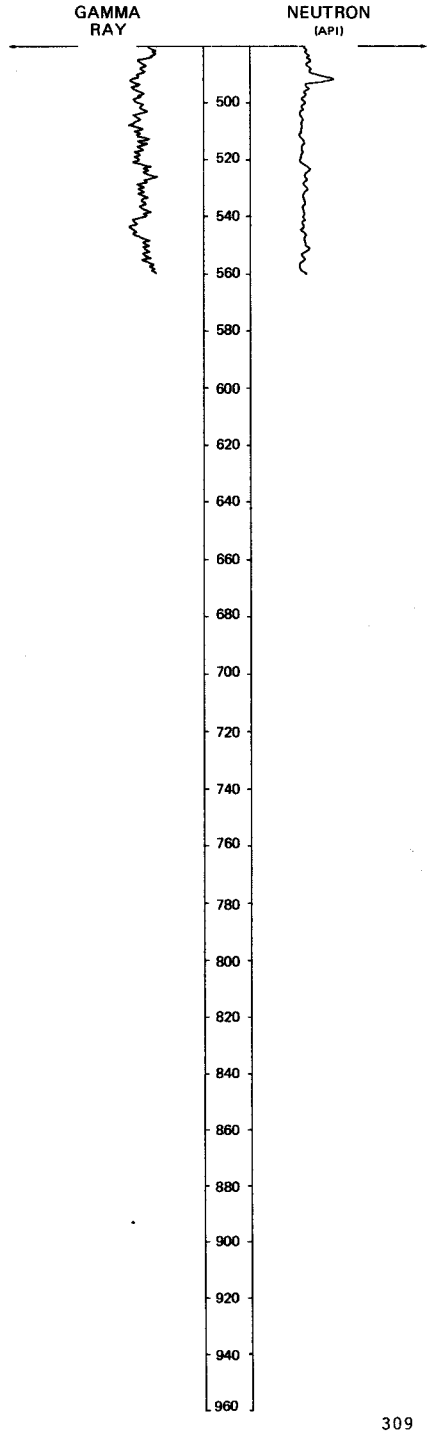
DESCRIPTION OF DEPOSITS

LOCATION: 155-080-15AAA

DATE DRILLED: 9/13/76

ALTITUDE: 1510
(FT, NGVD)

DEPTH: 560
(FT)



DESCRIPTION OF DEPOSITS

155-080-17CBA
(Log from Donald & Keith Erck Well Drilling, Inc.)

Date drilled: 6/23/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black dirt	2	2
	Yellow clay	20	22
	Blue clay; with some sand and some water	58	80
	Blue clay	52	132
	Fine blue sand; with some water	8	140
	Blue clay	10	150
	Blue clay; with streaks of blue sand	54	204

155-080-19CCB3
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1564 feet — Date drilled: 8/26/55

Glacial drift:			
	Topsoil	0.8	0.8
	Sand, buff, very fine, silty	4.2	5
	Sand, coarse, gravelly	3.2	8.2
	Till, brown, sandy, gravelly, oxidized, thin zones; 0.1 to 0.2 feet of coarse sands occurring in places	9	17.2
	Till, gray, sandy, gravelly, oxidized	9.2	26.4
	Sand, coarse; trace of clay	3.6	30
	Till, gray, silty	10	40

155-080-22AAA
NDSWC 1388

Altitude: 1540 feet — Date drilled: 9/13/58

Glacial drift:			
	Till, yellowish-brown, gravelly, oxidized	13	13
	Till, dark-gray, gravelly, pebbly	41	54
Cannonball Member:			
	Shale, gray, sandy, semiconsolidated	9	63

155-080-23BCC
(Log from North Dakota Geological Survey)

Altitude: 1540 feet — Date drilled: 7/21/70

	Till, grayish-brown; carbonates	4	4
	Till, grayish-brown	5	9
	Till, grayish-brown to rusty; oxidized stains	11	20
	Sand	1	21
	Till, brown	3	24
	Till, gray	2	26
	Till, brown	3	29
	Till, gray	5	34
	Sand, clayey; poor returns	5	39
	Sand, clayey	5	44
	Till, gray	5	49

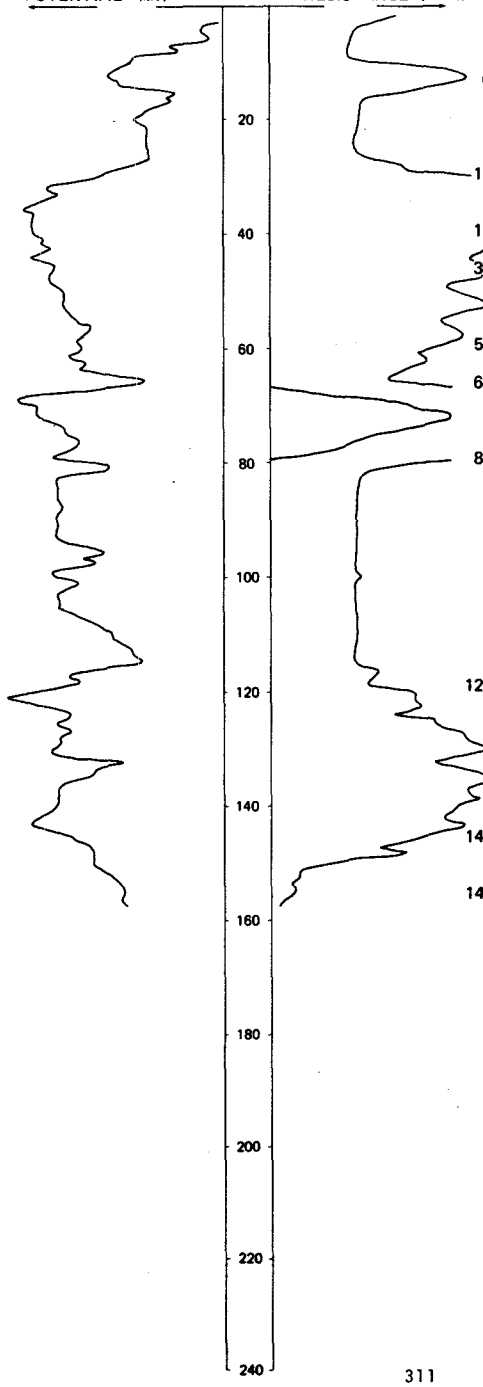
NDSWC 10128

LOCATION: 155-080-24AAA

DATE DRILLED: 7/12/78

ALTITUDE: 1518
(FT, NGVD)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-11	Till, yellowish-brown, sandy, pebbly, oxidized.
11-15	Sand, fine to medium, subrounded, partially oxidized.
15-30	Till, dark-gray, silty, sandy.
30-53	Sand, very fine to coarse, subrounded to rounded; becoming silty below 50 feet.
53-68	Till, dark-gray, sandy.
68-80	Gravel, fine; about 30 percent fine to very coarse sand; subrounded to rounded.
80-120	Till, dark-brownish-gray, sandy, pebbly; very gravelly from 116 to 118 feet.
120-148	Gravel, fine to medium, sandy; with some thin lenses of silty clay.

HELL CREEK FORMATION

148-149	Sandstone, reddish-brown, very fine, well-indurated.
149-160	Sandstone, brownish-gray, very fine to fine, clayey; interbedded with brown carbonaceous poorly indurated shale.

155-080-29CDC
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1567 feet — Date drilled: 8/24/55

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil	0.4	0.4
	Till, brown, sandy, oxidized; few small gravels	22.1	22.5
	Sand, gray, fine to medium, silty, fairly well graded	16.5	39
	Till, gray, sandy	1	40

155-080-30BCB
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1558 feet — Date drilled: 8/25/55

Glacial drift:			
	Topsoil	1	1
	Sand, gray, fine, silty	4	5
	Till, brown, sandy, oxidized	20	25
	Till, gray, sandy, oxidized	8	33
	Sand, buff, medium, silty, poorly graded	1	34

155-080-33DAD
(Log modified from U.S. Bureau of Reclamation)

Altitude: 1563 feet — Date drilled: 8/24/55

Glacial drift:			
	Topsoil	0.3	0.3
	Till, brown, sandy, oxidized; few small gravels	18.7	19
	Till, gray, sandy, oxidized	16	35

155-080-35BBB
NDSWC 1390

Altitude:	1540 feet	Date drilled:	7/15/58
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, gravelly, oxidized	22	23
	Till, dark-gray, gravelly, pebbly	31	54
Cannonball Member(?):			
	Shale, gray, sandy	9	63

156-075-19DDD
NDSWC 10032

Altitude:	1508 feet	Date drilled:	10/27/77
Glacial drift:			
	Clay, yellowish-brown, silty, sandy, oxidized	16	16
	Clay, olive-gray, silty	7	23
	Silt, dark-gray, clayey	7	30
	Till, dark-gray, silty, sandy; with thin gravel lenses from 39 to 44 feet	32	62
	Sandstone, light-green, medium; shove block	12	74
	Till, dark-gray, silty	6	80
	Gravel, fine to medium, sandy, subangular to rounded	1	81
Fox Hills Sandstone:			
	Sandstone, dark-green, fine to medium, glauconitic, indurated	4	85
	Shale, grayish-brown, carbonaceous, slightly indurated	15	100

156-075-20DAA
(Log from North Dakota Geological Survey)

Altitude:	1508 feet	Date drilled:	7/26/70
	Sand, very fine	1	1
	Silt, brown, clayey	8	9
	Clay, brown, wet	7	16
	Clay, gray, silty, plastic	11	27
	Till, gray	12	39

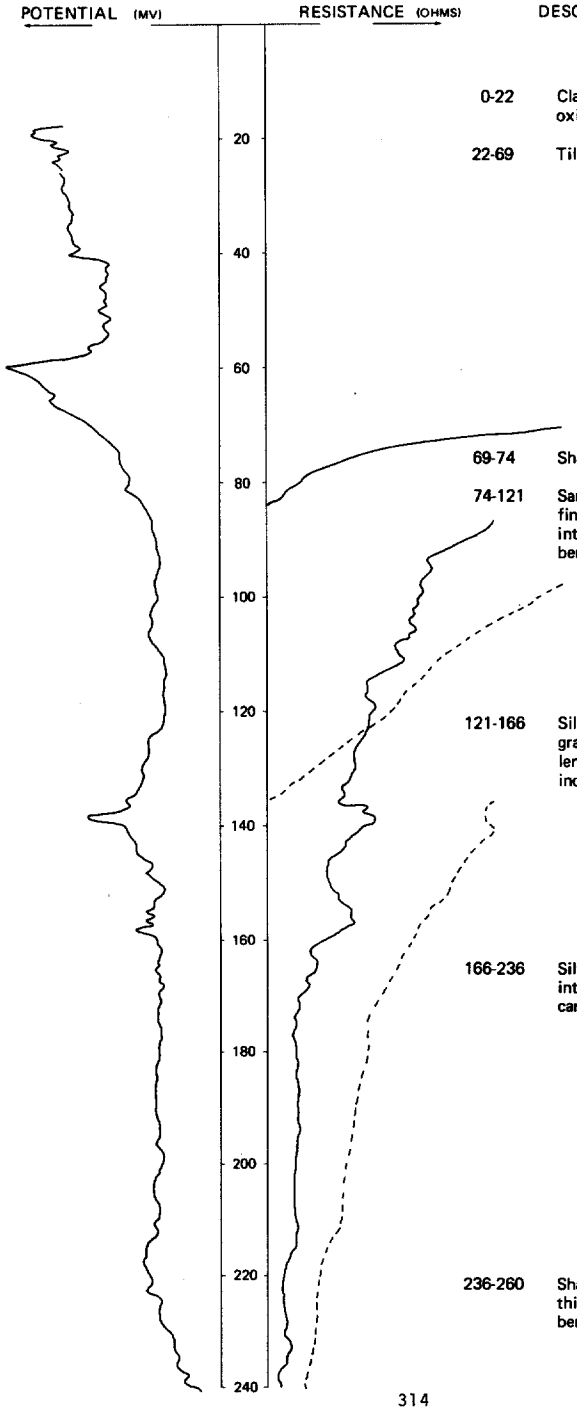
NDSWC 4986

LOCATION: 156-075-22CCC

DATE DRILLED: 9/22/76

ALTITUDE: (FT, NGVD) 1508

DEPTH: (FT) 260



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-22 Clay, yellowish-brown, very silty, oxidized.

22-69 Till, dark-olive-gray, silty, sandy.

FOX HILLS SANDSTONE

69-74 Shale, dark-brown, carbonaceous.

74-121 Sandstone, light-greenish-gray, very fine to fine, moderately indurated; interbedded with dark-gray bentonitic siltstone.

121-166 Siltstone, medium-gray to brownish-gray, bentonitic; interbedded with lenses of greenish-gray fine slightly indurated sandstone.

166-236 Siltstone, dark-gray, bentonitic; interbedded with brownish-gray carbonaceous shale.

PIERRE SHALE

236-260 Shale, black, siliceous, fissile; with thin laminations of limonitic bentonite.

LOCATION: 156-075-22CCC

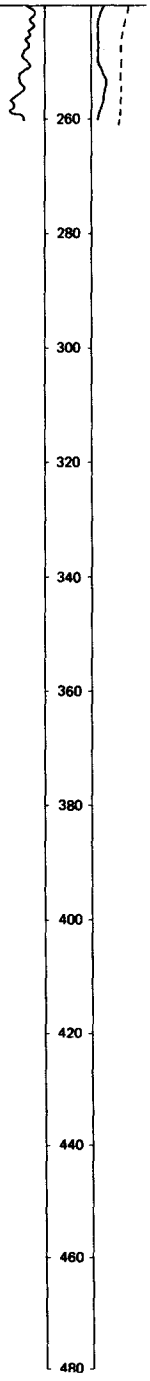
DATE DRILLED: 9/22/76

ALTITUDE: (FT, NGVD) 1508

DEPTH: (FT) 260

POTENTIAL (MV) RESISTANCE (OHMS)

DESCRIPTION OF DEPOSITS

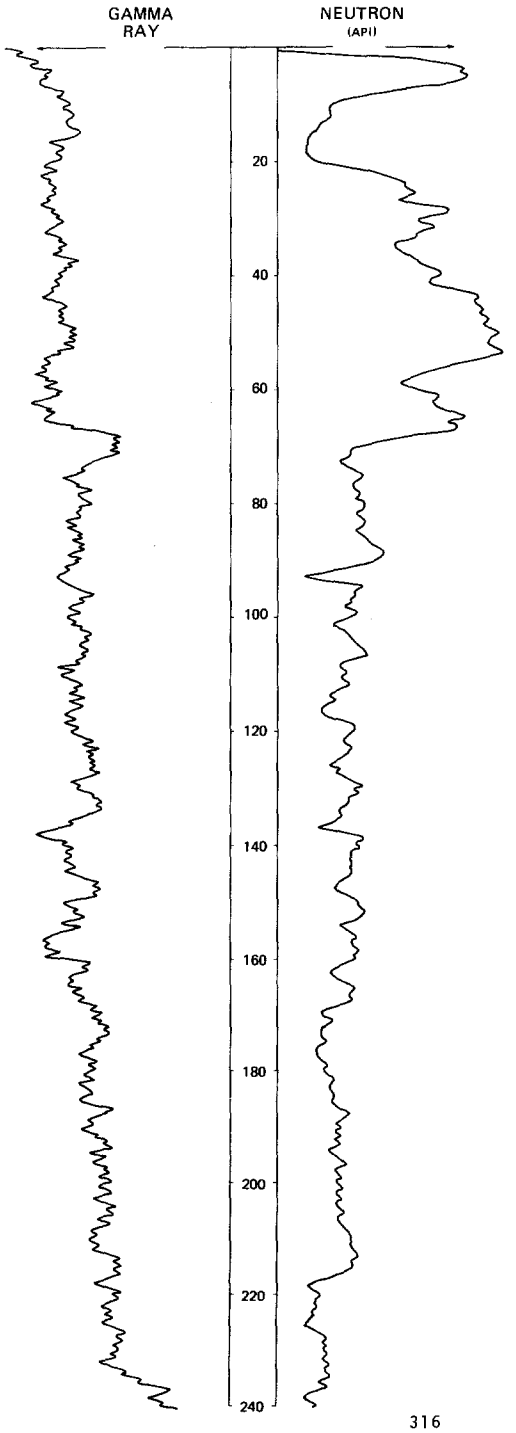


LOCATION: 156-075-22CCC

DATE DRILLED: 9/22/76

ALTITUDE: 1508
(FT, NGVD)

DEPTH: 260
(FT)



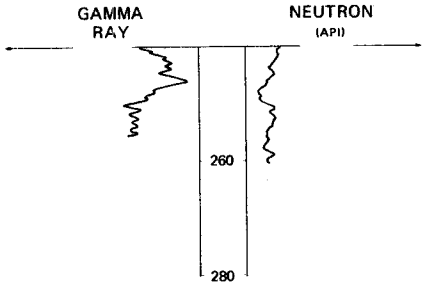
DESCRIPTION OF DEPOSITS

LOCATION: 156-075-22CCC

DATE DRILLED: 9/22/76

ALTITUDE: 1508
(FT, NGVD)

DEPTH: 260
(FT)



DESCRIPTION OF DEPOSITS

156-075-33CBC
(Log from Marchus Drilling)

Date drilled: 4/11/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand and yellow clay; mixed	13	13
	Gray clay silt	64	77
	Sandstone	1	78
	Gray clay silt	65	143
	Brown clay silt	32	175

156-076-08AAB
NDSWC 5861

Altitude: 1460 feet

Date drilled: 10/14/70

Alluvium:			
	Topsoil, brownish-black	1	1
	Sand, very fine to medium, silty, subangular to rounded	28	29
Glacial drift:			
	Till, dark-olive-gray, silty, sandy	28	57
Fox Hills Sandstone:			
	Shale, brownish-gray, carbonaceous; interbedded with thin lenses of greenish-gray fine moderately indurated sandstone	23	80

156-076-09ABC
NDSWC 10037

Altitude: 1455 feet

Date drilled: 10/31/77

Alluvium:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized; with greenish laminations	21	22
	Gravel, very coarse, well-rounded; some cobbles	24	46
Fox Hills Sandstone:			
	Sandstone, grayish-green, fine to medium, clayey, poorly indurated	4	50

156-076-09BAA
(Log modified from North Dakota Geological Survey)

Altitude:	1454 feet	Date drilled:	7/17/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Clay, brown, slightly sandy, oxidized	4	4
	Clay, gray, slightly sandy	15	19
	Clay, brown, silty; some beds of gray clay	2	21
	Clay, black, silty; organic soil	1	22
	Sand, greenish-brown, very fine, silty, wet	5	27
	Till(?)	2	29

156-076-10BDB1
NDSWC 10035

Altitude:	1455 feet	Date drilled:	10/28/77
Alluvium:			
	Topsoil, brownish-black	1	1
	Clay, dark-brown, interbedded with lenses of fine silty subrounded sand	31	32
	Gravel, fine to medium, subrounded; cobbles and boulders	8	40

156-076-10BDB2
NDSWC 10036

Altitude:	1455 feet	Date drilled.	10/28/77
Alluvium.			
	Topsoil, brownish-black	1	1
	Clay, dark-brown, silty; interbedded with thin lenses of fine silty sand	21	22
	Gravel, very coarse, rounded; cobbles and boulders	14	36

156-076-11BAB
(Log from C. A. Simpson & Son)

		Date drilled:	9/01/64
	Topsoil	1	1
	Brown soil	1	2
	Yellow sand; with pebbles	17	19
	Sand, gravel, and some clay	21	40
	Clay	1	41

156-076-22DDD
NDSWC 9376

Altitude: 1492 feet — Date drilled: 7/30/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellowish-brown, silty, oxidized	15	15
	Till, yellowish-brown, sandy, pebbly, oxidized	7	22
	Till, dark-gray, sandy, pebbly	16	38
	Sand, fine to very coarse; about 40 percent fine to medium gravel; angular to subrounded	4	42
	Till, dark-gray, silty; with thin lenses of sandy gravel	19	61
	Till, dark-gray, sandy, pebbly	15	76
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine to coarse, poorly indurated	2	78
	Shale, medium-gray to brownish-gray, partially carbonaceous; interbedded with greenish-gray fine clayey moderately indurated sandstone	22	100

156-076-26CCC
NDSWC 9377

Altitude: 1498 feet — Date drilled: 7/30/75

Glacial drift:			
	Sand, fine to coarse, predominantly coarse, subrounded to rounded, oxidized to 15 feet	20	20
	Clay, medium-gray, very silty	10	30
	Till, dark-gray, sandy, pebbly	48	78
Fox Hills Sandstone:			
	Shale, brownish-gray, brittle; interbedded with thin lenses of greenish-gray fine clayey moderately indurated sandstone	22	100

156-076-28CCC
NDSWC 10031

Altitude: 1455 feet — Date drilled: 10/27/77

Alluvium:			
	Topsoil, brownish-black	1	1
	Sand, medium, rounded, oxidized	7	8
	Sand, fine to medium, rounded, about 30 percent detrital lignite	14	22
	Silt, dark-gray, clayey; occasional thin lens of fine sand	36	58
Glacial drift:			
	Till, dark-gray, silty	4	62
	Gravel, fine to medium, sandy, subrounded	3	65
	Till, dark-gray, silty	4	69
	Gravel, fine to medium, sandy, subrounded	2	71
	Till, dark-gray, gravelly	22	93
	Till, dark-gray, silty	21	114
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine to medium, clayey, moderately indurated	10	124
	Shale, grayish-brown, silty, carbonaceous	16	140

156-076-29AAA
NDSWC 10361

Altitude: 1455 feet — Date drilled: 10/31/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium.			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, very silty, oxidized	11	12
	Gravel, fine to very coarse, predominantly coarse, well-rounded	2	14
Glacial drift:			
	Till, dark-gray, silty, sandy, pebbly	73	87
Fox Hills Sandstone:			
	Sandstone, greenish-gray, very fine to medium, very silty, poorly indurated	13	100

156-076-29BBD
(Log from C. A. Simpson & Son)

Date drilled: 10/25/66

Topsoil	3	3
Sandy blue clay	30	33
Fine sand	14	47
Blue clay	2	49

156-076-30AAA
NDSWC 10172

Altitude: 1452 feet — Date drilled: 8/07/78

Alluvium.			
	Sand, very fine to fine, about 10 percent silt, subangular to rounded: oxidized	6	6
	Clay, dark-brown, silty, sandy, carbonaceous	3	9
	Sand, very fine to fine, about 10 percent silt, subangular to rounded	13	22
	Clay, dark-gray, silty, sandy	2	24
	Sand, very fine to coarse, predominantly medium; about 10 percent silt, subangular to rounded	48	72
Fox Hills Sandstone:			
	Siltstone, brownish-gray, clayey; interbedded with lenses of light-gray very fine moderately indurated sandstone	31	103
	Sandstone, greenish-gray, fine, clayey, moderately indurated	5	108
	Shale, grayish-brown, silty, carbonaceous	12	120

156-076-30BAD
(Log from Schnell Inc.)

Date drilled: 7/28/60

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Topsoil	1	1
	Sandy loam	1	2
	Sand; with some light soil	2	4
	Fine sand	11	15
	Sand and lignite	3	18
	Coarse sand and rice gravel; with boulders	2	20
	Coarse gravel; with boulders	9	29
	Medium gravel; with boulders	7	36
	Sand, gravel, and lignite; with boulders	1	37
	Coarse gravel; with boulders	8	45
	Clay	2	47

156-076-30BDA
(Log from Schnell Inc.)

Date drilled: 8/10/60

Alluvium:			
	Sandy loam; topsoil	3	3
	Fine sand	2	5
	Medium sand	5	10
	Medium to coarse sand; with lignite at 19 feet; boulders	11	21
	Medium to coarse gravel; with lignite at 43 feet; boulders	26	47
	Blue clay	1	48
	Gravel	12	60
	Fine sand	---	60

156-076-34DDD
NDSWC 9378

Altitude: 1502 feet — Date drilled: 8/04/75

Glacial drift:			
	Sand, fine to coarse, predominantly medium, subrounded to rounded; oxidized to 10 feet	17	17
	Clay, dark-gray, silty, sandy	68	85
	Till, dark-gray, silty, pebbly; boulders from 109 to 112 feet	63	148
	Gravel, medium to coarse, angular to subrounded, abundant carbonates	4	152
Fox Hills Sandstone:			
	Shale, dark-brownish-gray, silty, carbonaceous, moderately indurated	8	160

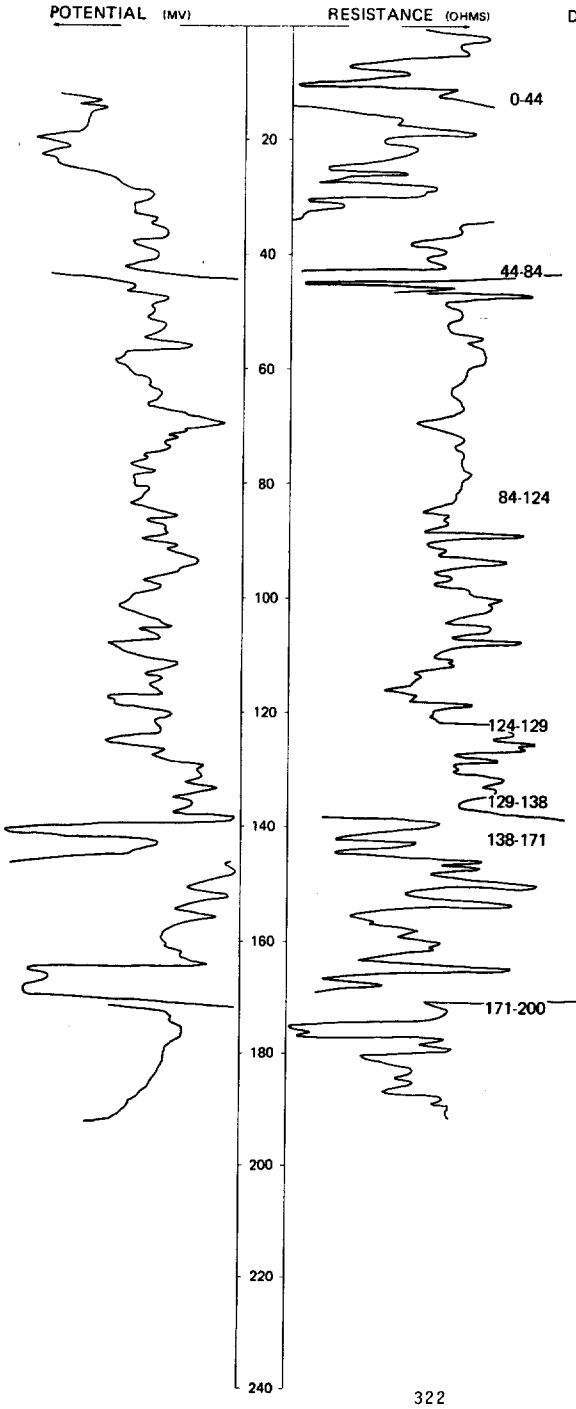
NDSWC 10171

LOCATION: 156-077-03DDD

DATE DRILLED: 8/02/78

ALTITUDE: (FT, NGVD) 1501

DEPTH: (FT) 200



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-44 Sand, very fine to coarse; about 20 percent silt; angular to sub-rounded; oxidized to 11 feet.

44-84 Clay, medium-dark-gray, silty; abundant detrital lignite.

84-124 Till, dark-gray, silty, sandy.

124-129 Gravel, fine, clayey; about 30 percent very coarse to coarse sand; subangular to rounded.

129-138 Till, dark-gray, sandy.

138-171 Sand, very fine to very coarse; about 30 percent fine gravel; subangular to rounded.

FOX HILLS SANDSTONE

171-200 Siltstone, dark-grayish-brown, clayey, moderately indurated; carbonaceous in places.

156-077-04CCC
NDSWC 9374

Altitude:	1500 feet	Date drilled:	7/30/75
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellowish-brown, very sandy, oxidized	5	5
	Sand, fine to coarse, subrounded to rounded, oxidized to 10 feet	17	22
	Sand, fine to medium, subrounded to rounded; about 40 percent silty clay; olive gray	18	40
	Silt, dark-gray, clayey, about 40 percent very fine to medium sand	45	85
	Till, dark-gray, silty to sandy	33	118
	Sand, fine to medium, silty, subrounded to rounded	4	122
	Till, dark-gray, silty, pebbly	14	136
Fox Hills Sandstone:			
	Shale, light-gray; interbedded with thin lenses of greenish-gray fine clayey moderately indurated sandstone	15	151
	Shale, medium-gray, silty, brittle, moderately indurated	9	160

156-077-08BBB
NDSWC 9569

Altitude:	1500 feet	Date drilled:	5/25/76
Glacial drift:			
	Sand, fine, rounded, well-sorted, oxidized	6	6
	Silt, yellowish-brown, clayey, oxidized	22	28
	Clay, dark-gray; with greenish-gray laminations; very silty from 54 to 74 feet	63	91
	Sand, very coarse, rounded, well-sorted	19	110
	Gravel, medium, subangular to rounded; clayey from 112 to 116 feet	17	127
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine to medium, clayey	13	140

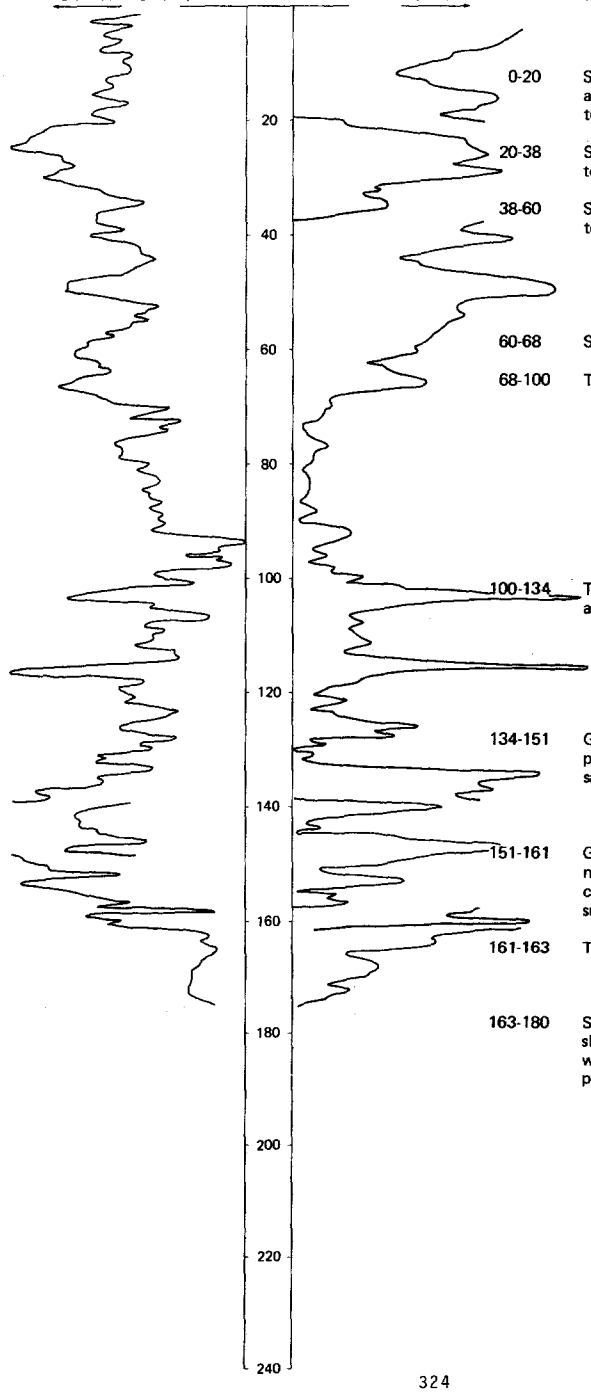
NDSWC 10170

LOCATION: 156-077-10BBB

DATE DRILLED: 8/01/78

ALTITUDE: 1495
(FT, NGVD)

DEPTH: 180
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Sand, very fine to medium, silty, angular to subrounded; oxidized to 11 feet.

20-38 Sand, fine to medium, angular to subrounded, well-sorted.

38-60 Sand, very fine to medium, silty to very silty, angular to subrounded.

60-68 Silt, dark-gray, clayey.

68-100 Till, dark-gray, silty to sandy.

100-134 Till, dark-gray, gravelly; cobbles and boulders.

134-151 Gravel, fine to medium; about 30 percent medium to very coarse sand; subrounded to rounded; clean.

151-161 Gravel, fine to coarse, predominantly medium; about 15 percent coarse to very coarse sand; subrounded to rounded.

161-163 Till, dark-gray, gravelly.

FOX HILLS SANDSTONE

163-180 Siltstone, light-grayish-brown, slightly carbonaceous; interbedded with light-gray very fine clayey poorly indurated sandstone.

156-077-12AAA
NDSWC 9367

Altitude:	1480 feet	Date drilled:	7/29/75
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellowish-brown, very silty, oxidized	14	14
	Clay, dark-gray, very silty	6	20
	Till, dark-gray, silty, pebbly	27	47
	Gravel, fine to coarse, sandy, subrounded to rounded	4	51
	Till, dark-gray, sandy	15	66
Fox Hills Sandstone:			
	Siltstone, light-gray, sandy, bentonitic, tight	8	74
	Shale, medium-gray, fissile, moderately indurated	26	100

156-077-12BBB
NDSWC 9568

Altitude:	1500 feet	Date drilled:	5/25/76
Glacial drift:			
	Sand, fine, rounded, well-sorted; oxidized to 19 feet	30	30
	Clay, greenish-gray, silty to sandy; fine sand from 64 to 65 feet	52	82
	Gravel, fine to medium, sandy, subrounded	3	85
	Till, olive-gray, sandy, pebbly; fine gravel from 96 to 98 feet	30	115
	Gravel, fine to medium, sandy, subrounded	16	131
Fox Hills Sandstone:			
	Sandstone, greenish-brown, fine, clayey; interbedded with grayish-brown clayey partially carbonaceous moderately indurated siltstone	13	144
	Shale, dusky-brown, carbonaceous; interbedded with grayish-brown indurated siltstone	16	160

156-077-13BBB1, 2
NDSWC 9368, 9368A

Altitude:	1476 feet	Date drilled:	7/29/75
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to medium, predominantly fine, subrounded to rounded, oxidized	5	5
	Clay, yellowish-brown, very silty, sandy, oxidized	15	20
	Sand, very fine to fine, subrounded to rounded, about 40 percent olive-gray silty clay	14	34
	Sand, fine to medium, subrounded to rounded; silty from 40 to 46 feet	12	46
	Till, dark-gray, very silty, sandy, pebbly	47	93
	Gravel, medium, angular to subrounded, abundant detrital lignite	2	95
	Till, dark-gray, very silty, pebbly	36	131
Fox Hills Sandstone:			
	Shale, light-gray to medium-gray, silty to sandy, moderately indurated; some carbonaceous streaks	29	160

156-077-13BCC
NDSWC 10052

Altitude:	1475 feet	Date drilled:	11/03/77
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Clay, yellowish-brown, silty to sandy, oxidized	18	19
	Sand, fine to medium, silty, clayey	21	40
	Till, dark-gray, silty, sandy	36	76
	Sand, fine to medium, predominantly fine, subangular to rounded	6	82
	Till, dark-gray, sandy	8	90
Fox Hills Sandstone:			
	Sandstone, light-gray, fine, clayey, semiconsolidated	7	97
	Sandstone, greenish-gray, fine, silty, semiconsolidated	5	102
	Siltstone, brownish-gray, clayey, moderately indurated; carbonaceous in places	18	120

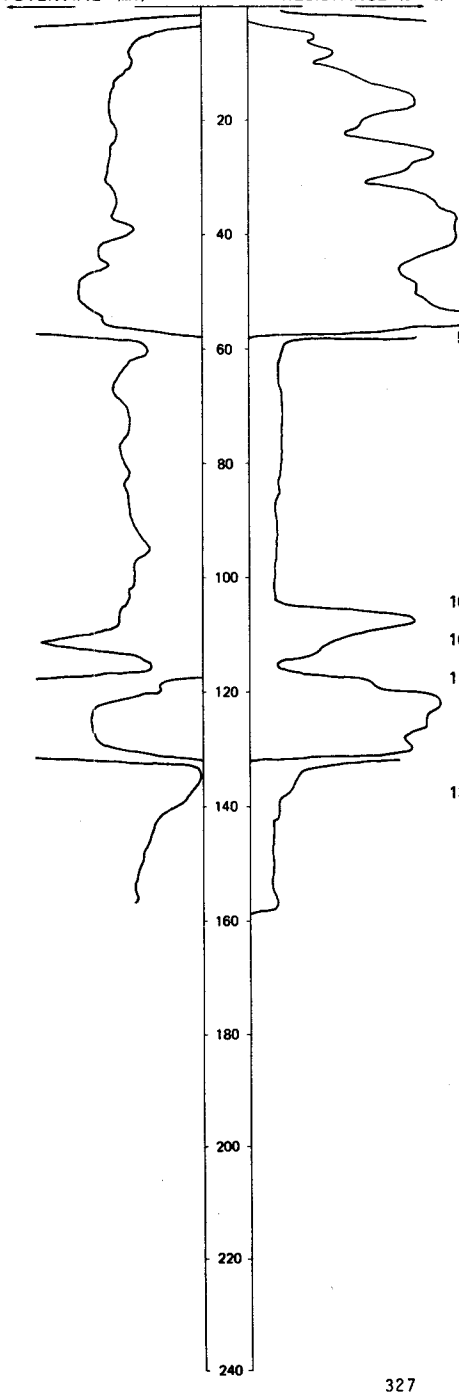
NDSWC 9369, 9369A

LOCATION: 156-077-13CCB1, 2

DATE DRILLED: 7/29/75

ALTITUDE (FT, NGVD): 1475

DEPTH (FT): 160



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-58	Sand, fine to very coarse, predominantly coarse, angular to subrounded; oxidized to 9 feet; abundant detrital lignite from 50 to 58 feet.
58-105	Till, dark-gray, silty, sandy, pebbly.
105-109	Sand, fine to medium, silty.
109-116	Clay, dark-gray, silty.
116-131	Gravel, medium to coarse, angular to subrounded; mostly carbonates; abundant detrital lignite.

FOX HILLS SANDSTONE

131-160	Shale, light-gray to medium-gray, silty to sandy, brittle, moderately indurated.

156-077-16DDD1, 2
NDSWC 5860, 5860A

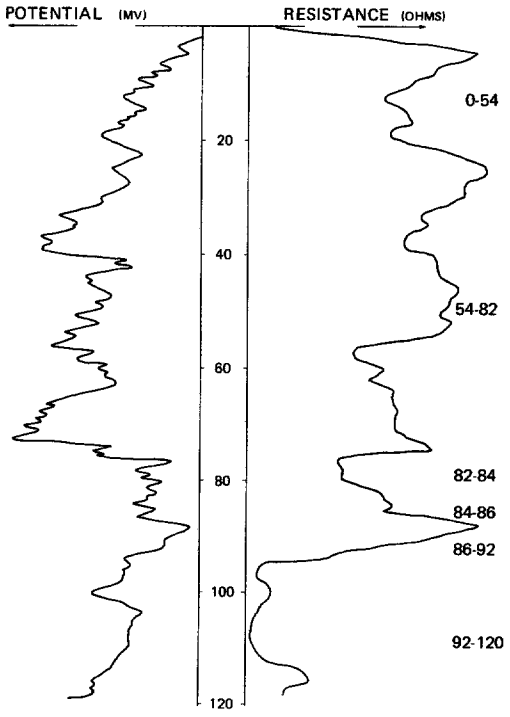
Altitude: 1498 feet — Date drilled: 10/13/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, very sandy, silty	1	1
	Sand, very fine to fine, silty, subangular to rounded, oxidized	2	3
	Clay, dusky-yellowish-brown, very silty, sandy, oxidized	8	11
	Sand, very fine to fine, subangular to rounded, well-sorted	38	49
	Till, olive-gray, silty, pebbly	51	100
	Gravel, fine to medium, sandy, angular to subrounded	7	107
	Till, olive-gray, silty, pebbly; occasional cobbles	20	127
	Gravel, fine to medium, sandy, angular to well-rounded; mostly carbonates	8	135
	Till, dark-gray, silty; interbedded with thin lenses of medium sand	12	147
Fox Hills Sandstone:			
	Shale, medium-gray; interbedded with greenish-gray fine clayey moderately indurated sandstone	13	160

NDSWC 9570

LOCATION: 156-077-17AAA — DATE DRILLED: 5/26/76

ALTITUDE (FT, NGVD): 1503 — DEPTH (FT): 120



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-54 Sand, fine to medium, well-rounded; oxidized to 9 feet; mostly quartz.

54-82 Clay, greenish-gray, silty to sandy.

82-84 Gravel, fine to medium, rounded.

84-86 Clay, dark-gray, sandy.

86-92 Gravel, fine to medium, sandy, subangular to rounded.

FOX HILLS SANDSTONE

92-120 Shale, dusky-brown, carbonaceous; interbedded with grayish-brown clayey siltstone.

156-077-22BBA
(Log modified from Adair Well Service)

Date drilled: 5/01/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil sand	2	2
	Yellow sand	13	15
	Gray fine sand	5	20
	Gray coarse sand	10	30
	Gray coarse sand and coal	20	50
	Gray fine sand	5	55
	Gray very fine sand	12	67
	Till	8	75

156-077-22BBB
(Log modified from Adair Well Service)

Date drilled: 5/01/74

	Topsoil sand	2	2
	Yellow sand	13	15
	Gray fine sand	43	58
	Sandy till	12	70
	Shale	5	75

156-077-22BBC
(Log modified from Adair Well Service)

Date drilled: 5/01/74

	Topsoil sand	2	2
	Yellow sand	8	10
	Gray fine sand	25	35
	Gray very fine sand	12	47
	Sandy till	8	55

156-077-22CAC
(Log modified from Adair Well Service)

Date drilled: 5/01/74

	Topsoil sand	2	2
	Yellow sand	13	15
	Gray sand	5	20
	Gray coarse sand	18	38
	Sticky clay	67	105

156-077-22CCC
NDSWC 9372

Altitude: 1497 feet — Date drilled: 7/30/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine, subrounded to rounded, oxidized	5	5
	Till, yellowish-brown, sandy, pebbly, oxidized	8	13
	Till, dark-gray, sandy, pebbly	8	21
	Sand, very fine to medium, gravelly, subrounded to rounded	5	26
	Till, dark-gray, silty	12	38
	Sand, fine to medium, gravelly, subrounded to rounded	4	42
	Till, dark-gray, silty, pebbly	11	53
	Sand, fine to coarse, gravelly, subangular to rounded	5	58
	Till, dark-gray, silty	9	67
Fox Hills Sandstone:			
	Sandstone, light-greenish-gray, fine to medium, clayey, slightly indurated	15	82
	Shale, light-greenish-gray, silty, sandy, moderately indurated	18	100

156-077-22DBA1
(Log modified from Adair Well Service)

Date drilled: 5/01/74

Topsoil sand	2	2
Yellow sand	13	15
Gray fine sand	5	20
Gray coarse sand	15	35
Coarse sand and coal	15	50
Gray fine sand	12	62
Sandy till	8	70
Shale	35	105

156-077-22DBB
(Log modified from Adair Well Service)

Date drilled: 5/01/74

Topsoil sand	2	2
Yellow sand	13	15
Gray fine sand	5	20
Gray coarse sand	10	30
Coal and sand	10	40
Coarse sand	5	45
Gray fine sand	15	60
Sticky shale	45	105

156-077-22DBC
(Log modified from Adair Well Service)

Date drilled: 5/01/74

Drift sand	2	2
Yellow sand	7	9
Yellow fine sand	11	20
Gray fine sand	5	25
Gray coarser sand	13	38
Sandy till	72	110
Sticky shale	25	135

156-077-23ADC
(Log modified from Adair Well Service)

Date drilled: 10/01/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Yellow fine sand	17	18
	Gray fine sand	7	25
	Medium sand	5	30
	Medium to coarse sand; coarser with depth	30	60
	Till	2	62

156-077-23BDD
(Log modified from Adair Well Service)

Date drilled: 10/ /74

	Topsoil	1	1
	Fine sand	24	25
	Medium to coarse clean sand; coarser with depth	37	62
	Gray fine sand	16	78
	Till	12	90

156-077-23CAB
(Log modified from Adair Well Service)

Date drilled: 5/01/74

	Brown sand	2	2
	Yellow sand	13	15
	Gray fine sand; some coal	5	20
	Gray coarser sand; more coal	5	25
	Gray coarse sand	25	50
	Clay till	55	105

156-077-23CBC
(Log from Adair Well Service)

Date drilled: 10/01/74

	Topsoil	1	1
	Fine sand	35	36
	Till	17	53

156-077-23DAC
(Log modified from Adair Well Service)

Date drilled: 10/01/74

	Topsoil	1	1
	Fine sand	14	15
	Coarse sand	20	35
	Medium sand	19	54
	Till	6	60

156-077-23DBD
(Log modified from Adair Well Service)

Date drilled: 5/01/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Brown sandy topsoil	2	2
	Yellow sand	18	20
	Gray sand and coal	10	30
	Gray coarser sand and coal	5	35
	Gray coarse sand	10	45
	Clean sand	5	50
	Clean gravel	13	63
	Sticky till	7	70
	Sticky shale	35	105

156-077-24CCC
NDSWC 9370

Altitude: 1482 feet — Date drilled: 7/29/75

Glacial drift:			
	Sand, fine to very coarse, angular to subrounded; oxidized to 18 feet, mostly quartz	34	34
	Gravel, fine to coarse, angular to subrounded; mostly carbonates; abundant detrital lignite	20	54
	Till, dark-gray, silty, sandy, pebbly	72	126
Fox Hills Sandstone:			
	Shale, brownish-gray, slightly carbonaceous; interbedded with thin lenses of light-greenish-gray fine clayey moderately indurated sandstone	14	140

156-077-24CDD
NDSWC 9375

Altitude: 1484 feet — Date drilled: 7/30/75

Glacial drift:			
	Sand, fine to very coarse, predominantly coarse, angular to subrounded; oxidized to 8 feet	30	30
	Gravel, fine to coarse; about 20 percent fine to very coarse sand; angular to subrounded	27	57
	Clay, medium-gray, very silty	8	65
	Till, medium-dark-gray, silty, sandy, pebbly	49	114
Fox Hills Sandstone:			
	Shale, light-gray to brownish-gray, partially carbonaceous; interbedded with thin lenses of greenish-gray fine silty moderately indurated sandstone	26	140

156-077-27AAA
NDSWC 9371

Altitude: 1480 feet — Date drilled: 7/29/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, predominantly coarse, angular to subrounded, oxidized to 10 feet; mostly quartz	20	20
	Gravel, medium to coarse, angular to subrounded; mostly carbonates, abundant detrital lignite	12	32
	Till, dark-gray, silty, sandy	21	53
	Gravel, fine to medium, subrounded to rounded	4	57
	Till, dark-gray, silty, pebbly	32	89
	Gravel, fine to coarse; about 30 percent fine to coarse sand; angular to subrounded	6	95
Fox Hills Sandstone:			
	Siltstone, light-greenish-gray, clayey, bentonitic, moderately indurated	15	110
	Shale, medium-gray, sandy, moderately indurated	10	120

156-077-29BBC
NDSWC 9373

Altitude: 1515 feet — Date drilled: 7/30/75

Glacial drift:			
	Sand, fine to coarse, predominantly coarse, angular to subrounded; oxidized to 6 feet	36	36
	Silt, dark-gray, clayey; about 40 percent very fine to fine sand	14	50
	Till, dark-gray, sandy	18	68
	Gravel, fine to coarse, sandy, subangular to rounded	4	72
	Till, dark-gray, silty, pebbly	14	86
Fox Hills Sandstone:			
	Shale, light-gray, silty; interbedded with lenses of greenish-gray very fine to fine moderately indurated sandstone	34	120

156-077-33BCB
NDSWC 9571

Altitude: 1520 feet — Date drilled: 5/26/76

Eolian:			
	Sand, medium, rounded, well-sorted; oxidized to 27 feet	40	40
Glacial drift:			
	Clay, greenish-gray, silty	32	72
	Till, olive-gray, silty, sandy, pebbly	24	96
Fox Hills Sandstone:			
	Shale, dusky-brown, very carbonaceous to lignitic	17	113
	Sandstone, greenish-gray, fine, clayey; interbedded with brownish-gray siltstone; carbonaceous streaks	7	120

156-078-01DDA
(Log from North Dakota Geological Survey)

Altitude: 1580 feet — Date drilled: 7/17/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand, very fine	2	2
	Sand, medium, pebbly	2	4
	Sand, fine to medium, silty, clayey	5	9
	Sand, medium to coarse; pebbles	15	24
	Sand, medium	5	29
	Sand, fine to medium	10	39
	Sand, medium to coarse, pebbly	5	44
	Sand, coarse, slightly pebbly	5	49
	Sand, medium to coarse, slightly pebbly	10	59
	Sand, medium	5	64
	Sand, coarse to very coarse	10	74

156-078-06CCC
NDSWC 10166

Altitude: 1494 feet — Date drilled: 7/31/78

Glacial drift:			
	Sand, fine to medium; about 20 percent silt; subrounded to rounded; oxidized	11	11
	Till, light-brown to dark-gray, silty, sandy; oxidized to 19 feet	25	36
	Till, dark-gray, silty; very sandy from 75 to 80 feet	58	94
Fox Hills Sandstone.			
	Siltstone, medium-dark-brown, moderately indurated; interbedded with dark-brown carbonaceous shale	26	120

156-078-08AAA
NDSWC 10167

Altitude: 1495 feet — Date drilled: 7/31/78

Glacial drift:			
	Sand, very fine to fine, predominantly fine, well-sorted, subrounded to rounded; oxidized to 10 feet	38	38
	Clay, dark-gray, silty; about 20 percent coarse sand	44	82
	Till, dark-gray, sandy	8	90
Fox Hills Sandstone:			
	Siltstone, dark-brown, clayey, indurated	10	100

156-078-11BBB
NDSWC 10169

Altitude: 1501 feet — Date drilled: 8/01/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine, subrounded to rounded, fairly sorted, oxidized	20	20
	Sand, very fine to medium, subrounded to rounded	12	32
	Clay, light-gray, silty, sandy	46	78
	Sand, fine to medium, silty, subrounded	3	81
	Till, dark-gray, silty, sandy	10	91
Fox Hills Sandstone:			
	Sandstone, light-gray, fine, poorly indurated	21	112
	Siltstone, grayish-brown, clayey, carbonaceous, moderately indurated	8	120

156-078-16DDD
NDSWC 5859

Altitude: 1510 feet — Date drilled: 10/13/70

Glacial drift:			
	Topsoil, brownish-black, very sandy	1	1
	Sand, very fine to fine, subangular to rounded, oxidized	18	19
	Sand, very fine, very silty to clayey, subrounded	9	28
	Till, olive-gray, silty to very silty, pebbly	61	89
	Gravel, fine to medium, sandy, angular to subrounded; mostly granitics	3	92
Fox Hills Sandstone:			
	Shale, grayish-brown, carbonaceous, moderately indurated	8	100

156-078-31AA
(Log modified from Midwest Valley)

Date drilled: 10/19/73

Soft sand	7	7
Fine sand; somewhat clean	5	12
Harder and dirtier sand	5	17
Gray fine dirty soft sand	8	25
Clay	2	27

156-078-33BBB
NDSWC 10135

Altitude: 1496 feet — Date drilled: 7/19/78

Glacial drift:			
	Sand, very fine to medium, subrounded to rounded; oxidized to 8 feet	54	54
	Sand, very fine to medium, subrounded to rounded; abundant detrital lignite	5	59
	Till, olive-gray, sandy; about 45 percent fine gravel; subrounded to rounded	27	86
Fox Hills Sandstone:			
	Siltstone, brownish-gray, clayey; interbedded with light-greenish-gray very fine poorly indurated sandstone; carbonaceous streaks	14	100

156-079-10AAD
(Log from U.S. Geological Survey)

Altitude:	1480 feet	Date drilled:	7/16/46
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, black, sandy	4	4
	Sand, gray	4	8
	Clay, blue to gray, sandy to silty; with sand, gravel, and small angular chert fragments	32	40
	Clay, dark-gray, sandy; with sand, gravel, small pebbles of shale, and small angular fragments of chert and lignite	10	50
	Sand, fine to coarse; with lignite fragments; 30 percent clean gravel	5	55
	Clay, gray to black, hard; with small amounts of sand and gravel	6	61
	Sand, fine to medium, loose	8	69
	Clay, dark-gray, tough; with small amounts of sand and gravel and small angular chert fragments	5	74
	Sand, fine to coarse, compact; with clay and much angular gravel	6	80
	Clay, gray to black; with sand and gravel	13	93
	Sand, gray; with brown streaks and a few small angular chert fragments	11	104
	Clay, brown to gray; with a few small angular chert fragments	7	111
	Sand, dark-gray, fine; with small lignite flakes	8	119
Fox Hills Sandstone:			
	Shale, dark-brown to black, lignitic	2	121

156-079-13DBB
NDSWC 10136

Altitude:	1480 feet	Date drilled:	7/19/78
Glacial drift:			
	Gravel, fine to coarse; about 40 percent very fine to coarse sand; subangular to rounded; oxidized	13	13
	Clay, dark-brown, very silty, oxidized	4	17
	Clay, light-greenish-gray, silty	17	34
	Till, dark-gray, silty, sandy	8	42
	Clay, dark-grayish-brown, silty, sandy	6	48
	Till, dark-gray, silty	17	65
	Gravel, fine to medium, sandy, subangular to rounded	5	70
	Till, dark-gray, silty, sandy, pebbly	27	97
Fox Hills Sandstone:			
	Siltstone, dark-brown, carbonaceous; interbedded with light-gray very fine clayey moderately indurated sandstone	23	120

156-079-14BBB
NDSWC 5865

Altitude:	1490 feet	Date drilled:	10/14/70
Glacial drift:			
	Topsoil, brownish-black, very sandy	1	1
	Sand, very fine to fine, silty, subangular to rounded; oxidized to 10 feet	13	14
	Till, olive-gray, silty, pebbly	45	59
Fox Hills Sandstone:			
	Shale, dusky-brown to greenish-gray, silty, partially carbonaceous, moderately indurated	21	80

156-079-16BBC
NDSWC 5866

Altitude:	1490 feet	Date drilled:	10/14/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, very fine tc fine, silty, subangular to rounded, oxidized	7	8
	Clay, olive-gray, very silty	7	15
	Till, dark-gray, silty; occasional lenses of fine gravel; some cobbles	53	68
Fox Hills Sandstone:			
	Shale, grayish-brown, partially carbonaceous; interbedded with lenses of greenish-gray fine moderately indurated sandstone	12	80

156-080-03BBB
NDSWC 10138

Altitude:	1508 feet	Date drilled:	7/19/78
Glacial drift.			
	Gravel, fine; about 40 percent fine to coarse sand; subrounded to rounded; oxidized	12	12
	Till, dark-gray, silty, sandy, pebbly	70	82
Hell Creek Formation:			
	Lignite	2	84
	Sandstone, light-gray, very fine, clayey, poorly indurated	16	100

156-080-21CDC
(Log from Mariner Drilling Service)

	Date drilled:	8/27/76
Surface	1	1
Yellow clay	25	26
Blue clay	42	68
Red sand	2	70
Blue clay	70	140
Hardpan	1	141
Blue clay	29	170
Hardpan	1	171
Brown clay	25	196
Hardpan	2	198
Blue sand and water	----	198

156-080-35BBB
NDSWC 1392

Altitude:	1515 feet	Date drilled:	9/16/58
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, gravelly, oxidized	10	11
	Till, dark-gray, pebbly, gravelly	41	52
Hell Creek Formation(?):			
	Clay, brown, sandy	11	63

156-080-36DDD
(Log modified from Nick Erck Well Drilling)

		Date drilled:	7/15/76
	Black topsoil	2	2
	Yellow clay	25	27
	Muddy sand	30	57
	Gray clay	67	124
	Hardpan	2	126
	Gray clay	17	143
	Blue sand	9	152

157-075-06AAA
NDSWC 10175

Altitude:	1454 feet	Date drilled:	8/08/78
Glacial drift:			
	Clay, light-gray, sandy, leached	3	3
	Sand, very fine to coarse, predominantly coarse, subrounded; oxidized to 7 feet	9	12
	Sand, very fine to very coarse, gravelly, subrounded to rounded; abundant detrital lignite	10	22
	Till, dark-gray, sandy	19	41
	Till, dark-gray; interbedded with thin lenses of fine to medium gravel	5	46
Fox Hills Sandstone:			
	Siltstone, dark-brownish-gray, clayey; interbedded with grayish-green very fine indurated sandstone; carbonaceous streaks	34	80

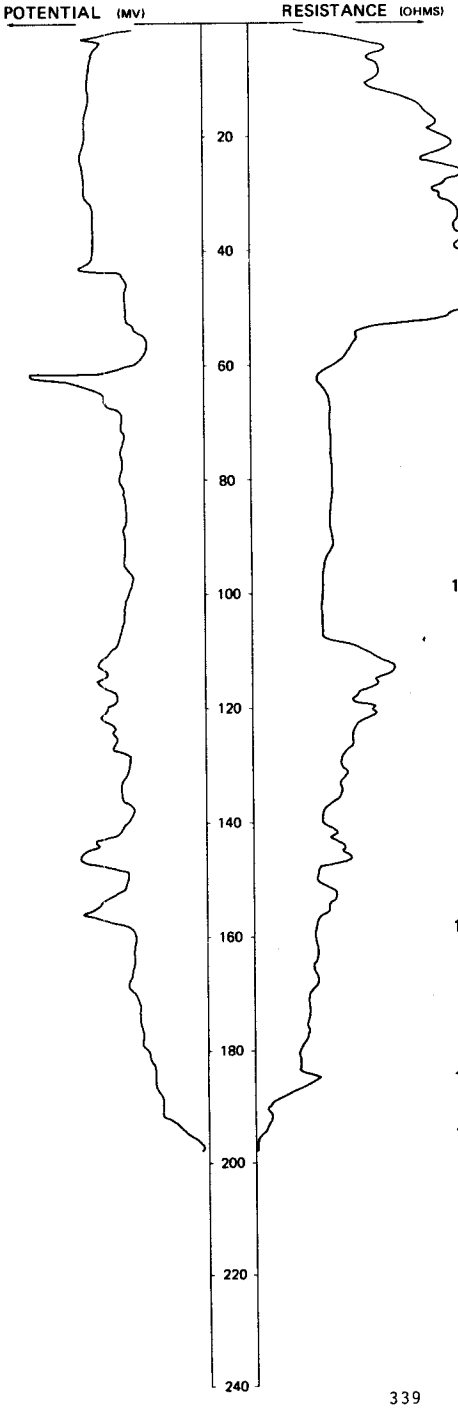
NDSWC 10360

LOCATION: 157-075-08CDD

DATE DRILLED: 10/31/78

ALTITUDE: 1467
(FT, NGVD)

DEPTH: 200
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-18	Sand, very fine to medium, predominantly medium, subrounded to rounded; oxidized to 11 feet.
18-55	Sand, very fine to very coarse, predominantly coarse, subrounded to rounded.
55-62	Clay, olive-gray, silty.
62-100	Till, dark-gray, silty, pebbly.
100-160	Till, dark-gray, sandy, gravelly; abundant detrital lignite.
160-187	Till, dark-gray, silty, pebbly.

FOX HILLS SANDSTONE

187-190	Sandstone, light-greenish-gray, fine to medium, glauconitic, indurated.
190-200	Shale, dark-grayish-black, silty, moderately indurated.

157-075-08DCB
(Log from Nick Erck Well Drilling)

Date drilled: 12/07/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Yellow clay sand	23	23
	Sand; water	4	27

157-075-11CAA
(Log from Mariner Drilling Service)

Date drilled: 5/31/74

	Surface	1	1
	Yellow clay and sand	8	9
	Yellow clay and gravel	4	13
	Sand and water	8	21
	Blue clay	28	49
	Gravel and rocks	1	50
	Blue clay and shale streaks	50	100

157-075-17BBB
(Log modified from North Dakota Geological Survey)

Altitude: 1475 feet

Date drilled: 7/16/70

Glacial drift:			
	Sand, fine, some coarse to very coarse; some pebbles	6	6
	Silt, sandy; organic layer	1	7
	Sand, brown, fine to medium, well-sorted	16	23
	Soil, bluish-gray	2	25
	Till, gray, wet	15	40
	Sand, gray, medium to very coarse; a few pebbles	19	59
	Till, gray, sandy	15	74

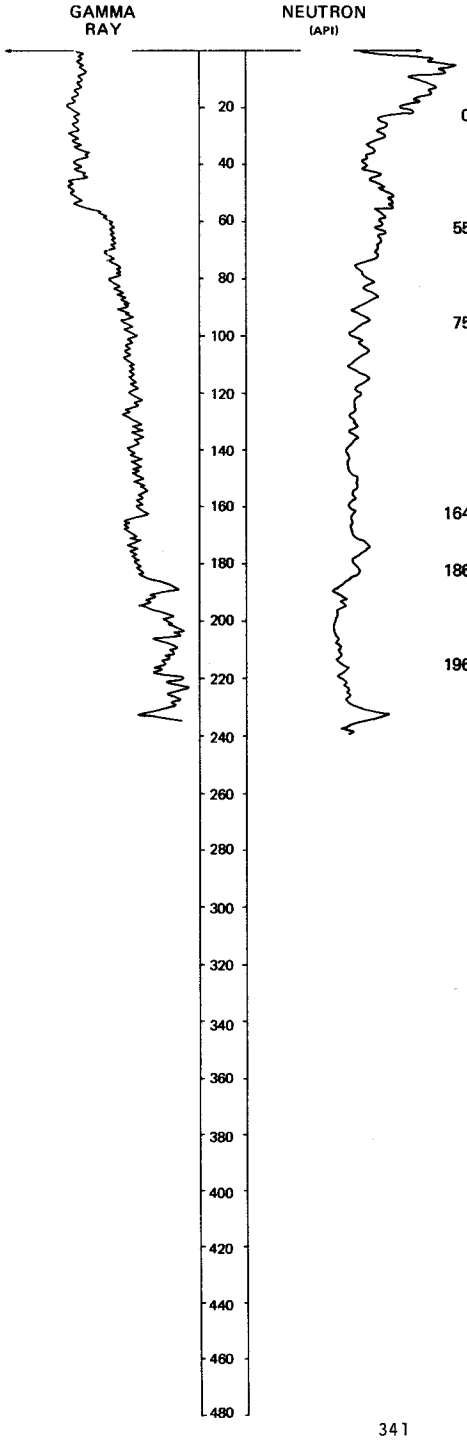
NDSWC 4985, 4985A

LOCATION: 157-075-20BBB1, 2

DATE DRILLED: 9/22/76

ALTITUDE: 1482
(FT, NGVD)

DEPTH: 240
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-55	Sand, fine to very coarse, predominantly medium, subangular to rounded; oxidized to 10 feet; abundant detrital lignite below 30 feet.
55-75	Till, medium-gray, silty, sandy, pebbly.

FOX HILLS SANDSTONE

75-164	Siltstone, light-greenish-gray, moderately indurated; occasional sandy intervals.
164-186	Sandstone, dark-green, fine, clayey, glauconitic.
186-196	Siltstone, medium-dark-gray, clayey, bentonitic, sticky.

PIERRE SHALE

196-240	Shale, grayish-black, siliceous, brittle, indurated; occasional thin lenses of gray bentonite.

157-075-24DDD
NDSWC 9397

Altitude: 1485 feet — Date drilled: 8/12/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, predominantly medium, angular to subrounded, oxidized; mostly quartz	11	11
	Clay, yellowish-orange to medium-gray, very silty; oxidized to 18 feet	29	40
	Till, dark-gray, silty, sandy, pebbly	27	67
Fox Hills Sandstone:			
	Shale, light-bluish-gray to medium-bluish-gray, silty to sandy, brittle, moderately indurated	59	126
	Sandstone, medium-gray, fine to medium, clayey, moderately indurated	19	145
	Shale, light-gray to medium-dark-gray, very silty to slightly sandy, moderately indurated, tight	75	220

157-075-30AAA
NDSWC 10178

Altitude: 1472 feet — Date drilled: 8/08/78

Glacial drift:			
	Sand, very fine to very coarse, predominantly medium, subrounded to rounded, oxidized	10	10
	Gravel, fine to medium, predominantly fine; about 30 percent very coarse to coarse sand; subangular to rounded	8	18
	Till, dark-gray, silty, sandy, pebbly	26	44
	Till, dark-gray; interbedded with thin lens of fine sandy gravel	4	48
Fox Hills Sandstone:			
	Sandstone, greenish-gray, very fine, clayey, moderately indurated	25	73
	Siltstone, grayish-brown, clayey, moderately indurated; carbonaceous in places	7	80

157-075-31AAB1, 2
FS-1, FS-1A

Altitude: 1485 feet — Date drilled: 11/01/66

Glacial drift:			
	Topsoil, dusky-brown, sandy	1	1
	Sand, medium to coarse, angular to subrounded	20	21
	Gravel, fine to medium; about 25 percent medium to coarse sand; subangular to subrounded	6	27
	Till, olive-gray, silty, pebbly	12	39
	Gravel, fine to medium; about 30 percent medium to coarse sand; subangular to subrounded	3	42
	Till, dark-gray, silty, pebbly	11	53
Fox Hills Sandstone:			
	Sandstone, dark-greenish-gray, very fine, moderately indurated; silty to clayey intervals	31	84

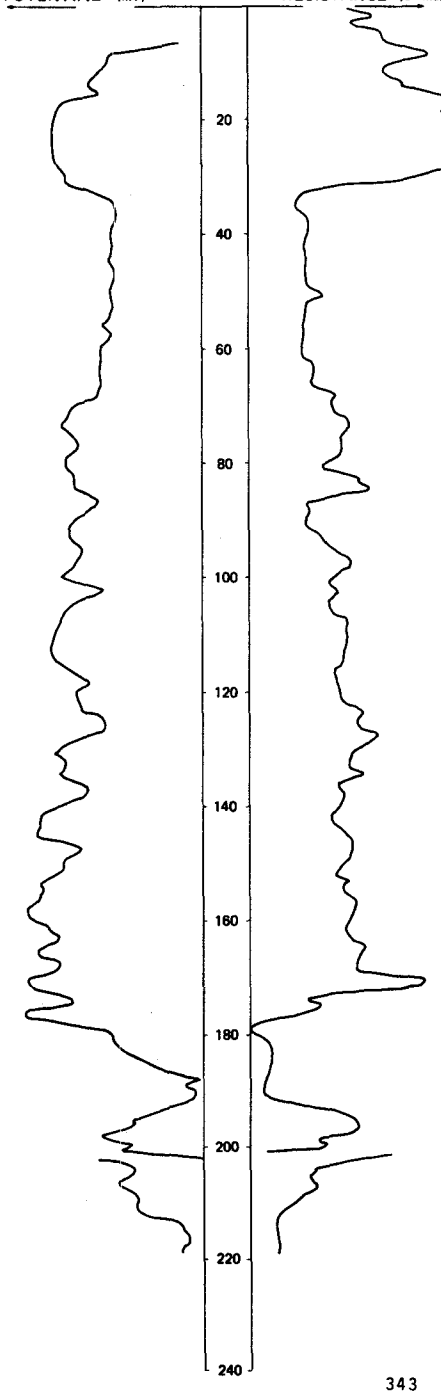
NDSWC 10173

LOCATION: 157-076-02BBB

DATE DRILLED: 8/07/78

ALTITUDE: (FT, NGVD) 1448

DEPTH: (FT) 220



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-15	Sand, very fine to coarse, predominantly fine, subangular to rounded; oxidized to 11 feet.
15-32	Sand, medium to very coarse; about 20 percent very fine gravel; subangular to rounded.
32-67	Till, dark-gray, silty, pebbly.
67-68	Gravel, fine to coarse, subrounded; cobbles.
68-170	Till, dark-gray, silty, sandy, pebbly.
170-173	Gravel, fine to coarse, sandy, subrounded.
173-194	Till, dark-gray, silty, pebbly.
194-201	Till, dark-gray, gravelly, very sandy.

FOX HILLS SANDSTONE

201-220	Sandstone, dark-greenish-gray, fine, clayey; interbedded with medium-brown carbonaceous moderately indurated siltstone.

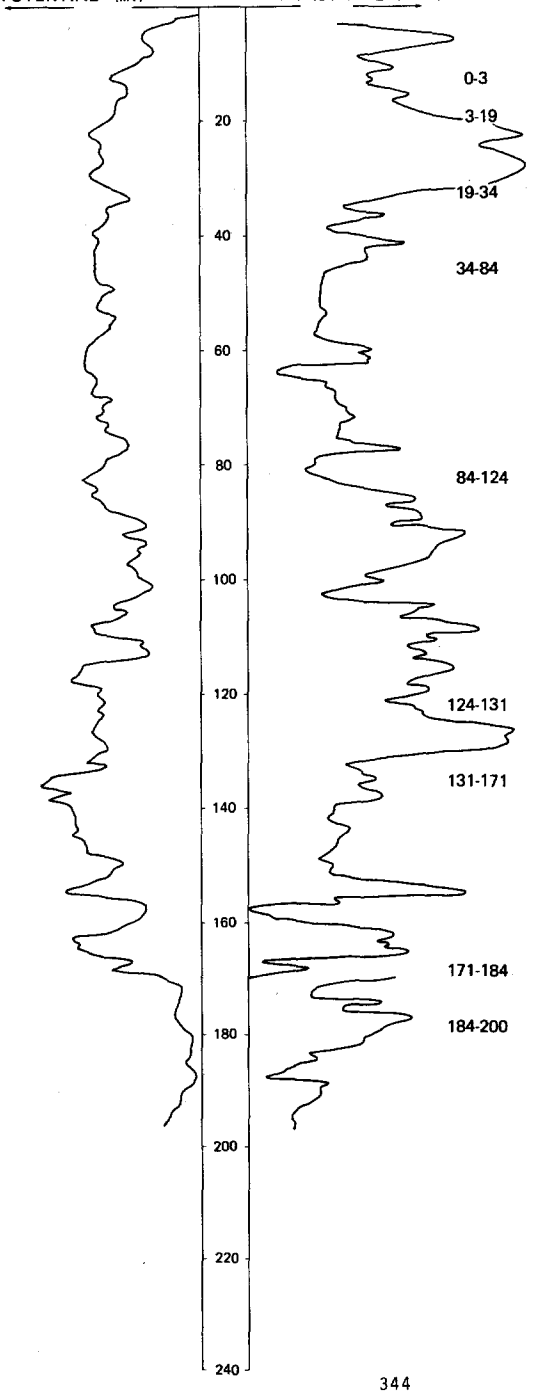
NDSWC 10174

LOCATION: 157-076-11AAA

DATE DRILLED: 8/08/78

ALTITUDE: (FT, NGVD) 1450

DEPTH: (FT) 200



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-3 Clay, light-gray, very silty, leached.

3-19 Sand, very fine to coarse, predominantly medium, subangular to rounded; oxidized to 11 feet.

19-34 Sand, fine to very coarse; about 20 percent fine gravel; subangular to rounded; abundant detrital lignite.

34-84 Till, dark-gray, silty, sandy, pebbly.

84-124 Till, dark-gray, silty; occasional lenses of sandy gravel.

124-131 Gravel, fine to medium; about 30 percent medium to very coarse sand; subangular to rounded.

131-171 Till, dark-gray, silty; with occasional lenses of sandy gravel.

FOX HILLS SANDSTONE

171-184 Sandstone, greenish-gray, fine, clayey, moderately indurated.

184-200 Siltstone, grayish-brown, clayey, carbonaceous, bentonitic, poorly indurated.

157-076-12ABB
(Log modified from Nick Erck Well Drilling)

Date drilled: 11/17/73

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black topsoil	2	2
	Silty sand	37	39
	Sand	3	42

157-076-14BBB
NDSWC 10039

Altitude: 1460 feet — Date drilled: 11/01/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, fine, subrounded, oxidized	9	10
	Till, dark-gray, silty, pebbly; some cobbles	24	34
	Till, dark-gray, silty; some thin lenses of sand	5	39
	Sand, fine to medium, silty, subangular to rounded	7	46
	Till, dark-gray, sandy, pebbly	7	53
	Till, dark-gray, silty, pebbly; very sandy from 66 to 67 feet	14	67
Fox Hills Sandstone:			
	Sandstone, light-green, fine to medium, clayey, indurated	13	80

157-076-16AAA
NDSWC 5862

Altitude: 1477 feet — Date drilled: 10/14/70

Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, very fine to medium, silty, subangular to rounded, oxidized	10	11
	Till, olive-gray, silty, pebbly; some cobbles	37	48
	Till, dark-gray, silty, pebbly	26	74
Fox Hills Sandstone:			
	Shale, brownish-gray, carbonaceous; interbedded with thin lenses of bluish-gray fine moderately indurated sandstone	26	100

157-076-21CCD
(Log modified from C. A. Simpson & Son)

Altitude: 1495 feet — Date drilled: 9/22/66

	Topsoil	1	1
	Blue fine sandy clay	22	23
	Blue very sandy clay	57	80
Fox Hills Sandstone:			
	Sandstone	7	87

157-076-25BBB
NDSWC 10038

Altitude: 1455 feet — Date drilled: 11/01/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, medium, subrounded to rounded; about 30 percent detrital lignite; oxidized	19	20
	Till, dark-gray, sandy; cobbles from 27 to 28 feet	12	32
Fox Hills Sandstone:			
	Sandstone, light-green, fine, clayey, moderately indurated	8	40

157-076-28D
(Log modified from C. A. Simpson & Son)

Date drilled: 11/25/64

Topsoil	1	1
Yellow sandy clay	21	22
Blue sandy clay	48	70
Sand	5	75

157-076-29AD
(Log modified from C. A. Simpson & Son)

Date drilled: 12/01/64

Topsoil	1	1
Yellow sandy clay	19	20
Blue sandy clay	62	82
Blue gravelly clay	15	97
Blue sandy clay	21	118
Blue shale	42	160

157-076-34BAA
NDSWC 9365

Altitude: 1465 feet — Date drilled: 7/28/75

Glacial drift:			
	Sand, very fine to fine, clayey, subrounded to rounded, oxidized	6	6
	Sand, medium to very coarse, predominantly coarse, angular to subrounded	16	22
	Till, medium-dark-gray, silty, sandy, pebbly	30	52
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine, clayey, moderately indurated	23	75
	Shale, light-gray, silty, brittle, moderately indurated	5	80

157-076-34DDD
NDSWC 9366

Altitude: 1465 feet — Date drilled: 7/28/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, fine to coarse, predominantly medium, gravelly, angular to subrounded	16	16
	Till, medium-dark-gray, silty, sandy, pebbly	40	56
Fox Hills Sandstone:			
	Shale, light-gray, silty, brittle	6	62
	Sandstone, greenish-gray, fine, clayey, indurated	2	64
	Shale, medium-gray, silty, moderately indurated	16	80

157-076-35CBD
(Log modified from Midwest Valley)

Date drilled: 4/06/73

Sand	7	7
Clay; gets hard with depth	40	47
Till	21	68
Rocks	2	70
Sandy clay	2	72

157-076-35CCB
(Log modified from Midwest Valley)

Date drilled: 4/06/73

Red sand	7	7
Soft clay	12	19
Clay	28	47
Silty sand	6	53
Soft clay	4	57
Silty sand	5	62
Sandy clay	11	73
Clay	2	75

157-076-35CDB
(Log modified from Midwest Valley)

Date drilled: 4/06/73

Red soft sand	7	7
Soft clay	40	47
Silty sand; with clay lenses	21	68
Brown clay	1	69

157-077-11DAD
NDSWC 10042

Altitude: 1472 feet — Date drilled: 11/01/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Silt, yellowish-brown, clayey, sandy, oxidized	7	8
	Clay, olive-gray, silty	18	26
	Till, dark-gray, silty, sandy	42	68
	Till, dark-gray, very sandy	9	77
	Sand, fine to medium, silty, subrounded to rounded	4	81
Fox Hills Sandstone:			
	Siltstone, light-bluish-green, clayey; interbedded with thin lenses of grayish-green fine clayey moderately indurated sandstone	19	100

157-077-12CCD
NDSWC 10040

Altitude: 1475 feet — Date drilled: 11/01/77

Glacial drift:			
	Topsoil, yellowish-brown	1	1
	Silt, yellowish-brown, clayey, sandy, oxidized	14	15
	Clay, olive-gray, silty	12	27
	Till, dark-gray, silty, sandy	38	65
	Sand, medium to coarse, subangular to rounded	2	67
	Till, dark-gray, sandy	3	70
	Sand, medium to coarse, subrounded to rounded	2	72
	Till, dark-gray, sandy, gravelly	13	85
Fox Hills Sandstone:			
	Shale, brownish-gray, slightly carbonaceous, bentonitic	8	93
	Sandstone, greenish-gray, fine, clayey, moderately indurated	7	100

157-077-14AAA
NDSWC 10041

Altitude: 1478 feet — Date drilled: 11/01/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Silt, yellowish-brown, clayey, oxidized	12	13
	Clay, dark-gray, silty to sandy	14	27
	Till, dark-gray, sandy; gravelly at 80 feet	55	82
Fox Hills Sandstone:			
	Siltstone, light-greenish-gray, clayey, moderately indurated, banded	18	100

157-077-15CCC
NDSWC 5863

Altitude: 1498 feet — Date drilled: 10/14/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, dusky-yellow, very silty, oxidized	11	12
	Clay, olive-gray, very silty; with light-gray mottling	8	20
	Till, dark-gray, silty, sandy, pebbly	64	84
	Gravel, fine to medium, sandy, angular to subrounded	3	87
	Till, dark-gray, silty; occasional thin lenses of medium sand; some cobbles	41	128
Fox Hills Sandstone:			
	Shale, medium-brownish-gray, sandy, moderately indurated	12	140

157-077-26C
(Log modified from C. A. Simpson & Son)

Date drilled: 11/24/64

	Topsoil	1	1
	Yellow sandy clay	22	23
	Blue sandy clay	87	110
Fox Hills Sandstone:			
	Sandy shale	15	125

157-077-27DDD
NDSWC 10054

Altitude: 1490 feet — Date drilled: 11/03/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Silt, yellowish-brown, clayey, oxidized	10	11
	Clay, olive-gray, silty, sandy	11	22
	Till, dark-gray, silty, sandy, pebbly	55	77
	Cobbles and boulders	1	78
	Till, dark-gray, sandy	3	81
	Sand, fine to medium, subrounded	1	82
	Till, dark-gray, silty, sandy, pebbly	11	93
Fox Hills Sandstone:			
	Sandstone, light-greenish-gray, fine, silty, moderately indurated	8	101
	Sandstone, light-gray, fine, indurated; carbonaceous streaks	3	104
	Siltstone, brownish-gray, clayey, slightly carbonaceous, moderately indurated	16	120

157-077-34DDD
NDSWC 10053

Altitude: 1485 feet — Date drilled: 11/03/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized	11	12
	Clay, olive-gray, silty	41	53
	Till, dark-gray, silty, pebbly	34	87
	Sand, fine to medium, subangular to rounded	2	89
	Till, dark-gray, silty, pebbly	29	118
	Sand, medium, subrounded	1	119
	Till, dark-gray, sandy	3	122
	Sand, medium, subangular to rounded	3	125
	Till, dark-gray, sandy	5	130
	Gravel, fine to medium, sandy, subangular to subrounded	3	133
Fox Hills Sandstone:			
	Sandstone, greenish-gray, fine, silty, poorly indurated	15	148
	Siltstone, brownish-gray, clayey, partially carbonaceous, moderately indurated	12	160

157-077-36BBB
NDSWC 10055

Altitude: 1488 feet — Date drilled: 11/03/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, yellowish-brown	1	1
	Silt, yellowish-brown, clayey, oxidized	11	12
	Silt, dark-gray, clayey	18	30
	Till, dark-gray, silty, sandy, pebbly	32	62
	Sand, medium to coarse, subangular	2	64
	Till, dark-gray, sandy	7	71
	Sand, medium to coarse, subangular to rounded	4	75
	Till, dark-gray, pebbly	10	85
	Sand, medium to coarse, subrounded	2	87
	Till, dark-gray, sandy	4	91
	Sand, fine to very coarse, subangular to rounded	2	93
	Till, dark-gray, silty, pebbly	6	99
Fox Hills Sandstone:			
	Sandstone, light-gray, fine, silty, slightly indurated	21	120

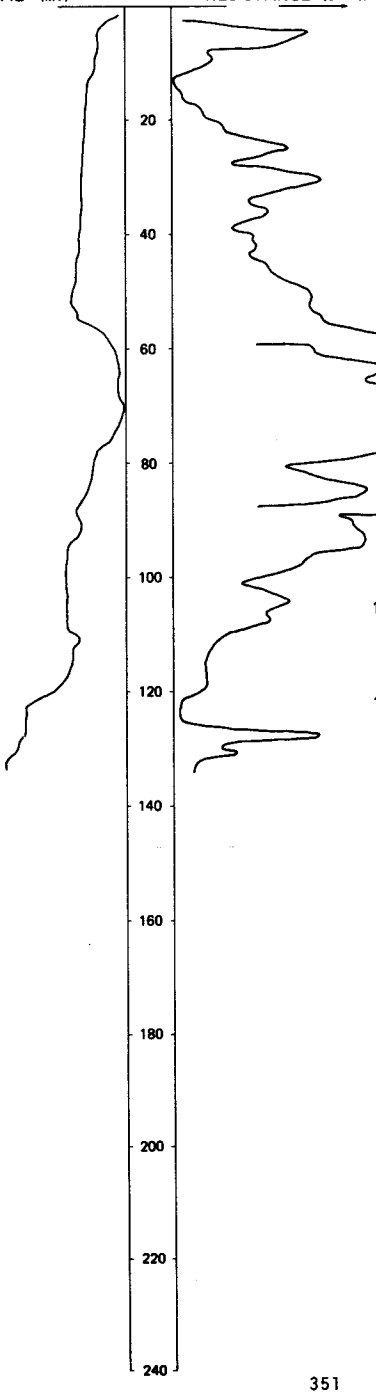
NDSWC 10161

LOCATION: 157-078-01CCC

DATE DRILLED: 7/27/78

ALTITUDE: (FT, NGVD) 1491

DEPTH: (FT) 140



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-7	Sand, very fine to fine, silty, oxidized.
7-18	Clay, yellowish-brown, silty, sandy, oxidized.
18-28	Till, olive-gray, silty; with thin lenses of fine to medium sand.
28-32	Sand, fine to medium, gravelly, subangular to rounded.
32-59	Till, dark-gray, silty, pebbly; with thin lenses of medium gravelly sand.
59-90	Gravel, fine; about 30 percent medium to very coarse sand; subangular to rounded.
90-108	Till, dark-gray, silty; with thin lenses of medium sand.
108-121	Till, dark-gray, silty, pebbly.

FOX HILLS SANDSTONE

121-140	Sandstone, light-gray, very fine to fine, clayey; interbedded with grayish-brown clayey carbonaceous slightly indurated siltstone.

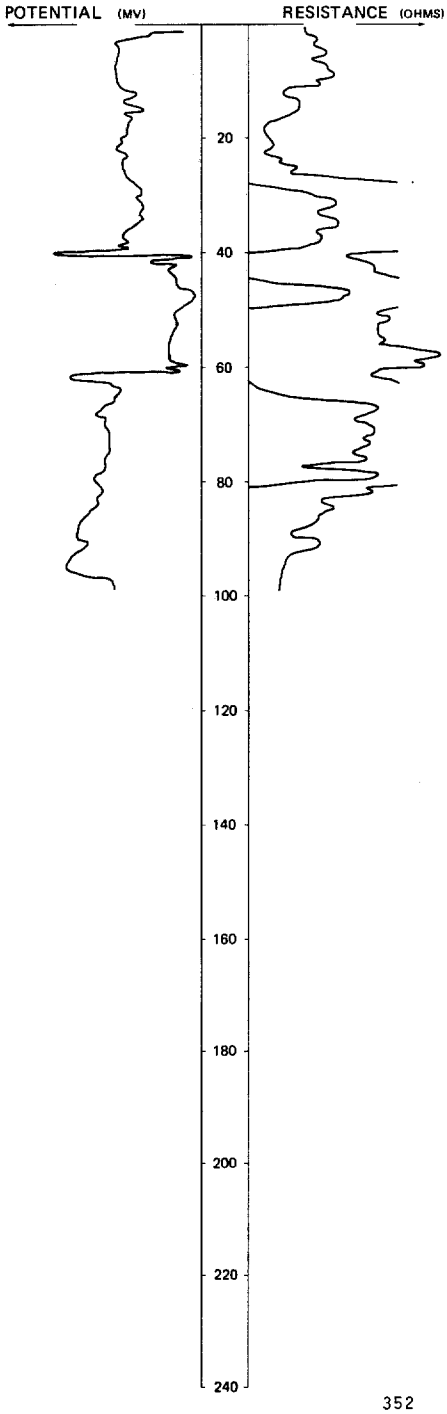
NDSWC 10359

LOCATION: 157-078-08ADD

DATE DRILLED: 10/31/78

ALTITUDE: (FT, NGVD) 1475

DEPTH: (FT) 120



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brown, sandy.
1-11	Sand, very fine to medium, predominantly medium, subangular to rounded; oxidized to 4 feet.
11-18	Clay, light-gray to light-brown, silty, partly leached.
18-29	Till, olive-gray, silty, sandy, pebbly.
29-39	Sand, fine to medium, gravelly, well-rounded.
39-45	Till, olive-gray, silty, sandy, pebbly.
45-50	Sand, fine, gravelly, subrounded.
50-66	Till, olive-gray, silty, very sandy.
66-81	Sand, medium to very coarse; about 30 percent coarse gravel; angular to subrounded; mostly carbonates.
81-109	Till, dark-gray, silty, sandy, slightly gravelly.

FOX HILLS SANDSTONE

109-120	Sandstone, greenish-gray, fine to medium, poorly indurated; interbedded with grayish-brown carbonaceous brittle shale.

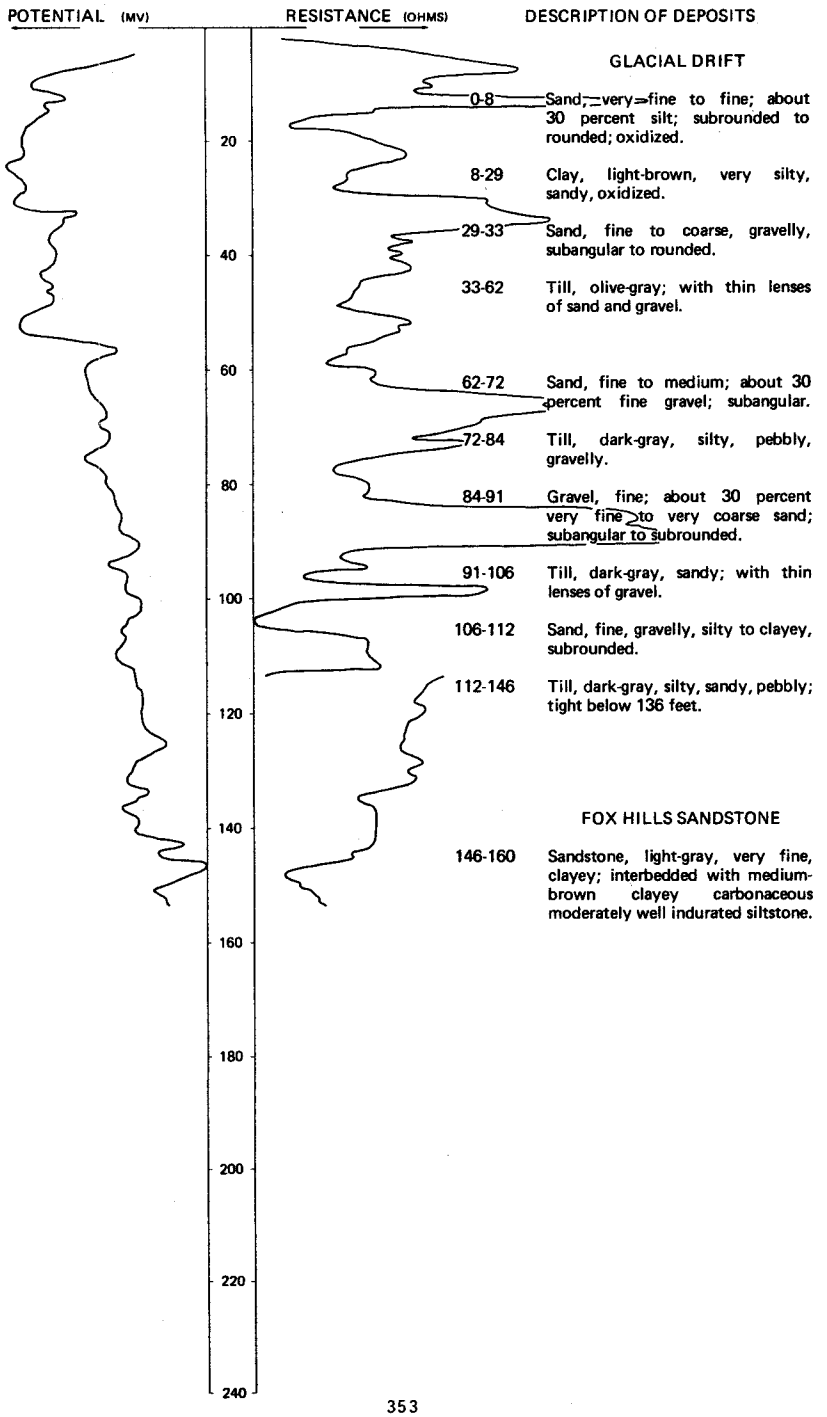
NDSWC 10162

LOCATION: 157-078-12CCD

DATE DRILLED: 7/28/78

ALTITUDE: (FT, NGVD) 1510

DEPTH: (FT) 160



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Sand; very fine to fine; about 30 percent silt; subrounded to rounded; oxidized.
8-29	Clay, light-brown, very silty, sandy, oxidized.
29-33	Sand, fine to coarse, gravelly, subangular to rounded.
33-62	Till, olive-gray; with thin lenses of sand and gravel.
62-72	Sand, fine to medium; about 30 percent fine gravel; subangular.
72-84	Till, dark-gray, silty, pebbly, gravelly.
84-91	Gravel, fine; about 30 percent very fine to very coarse sand; subangular to subrounded.
91-106	Till, dark-gray, sandy; with thin lenses of gravel.
106-112	Sand, fine, gravelly, silty to clayey, subrounded.
112-146	Till, dark-gray, silty, sandy, pebbly; tight below 136 feet.

FOX HILLS SANDSTONE

146-160	Sandstone, light-gray, very fine, clayey; interbedded with medium-brown clayey carbonaceous moderately well indurated siltstone.

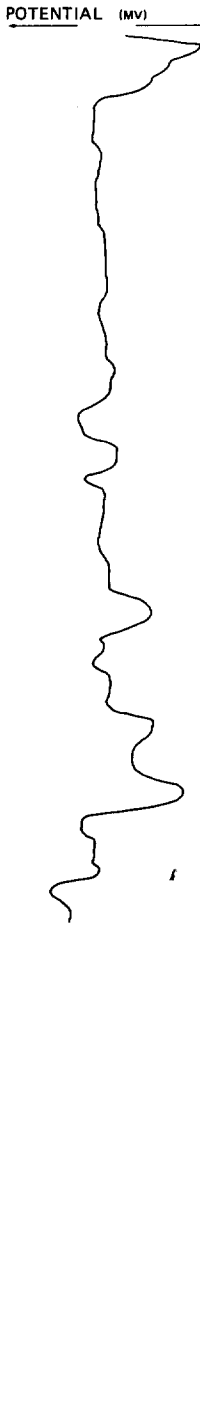
NDSWC 10163

LOCATION: 157-078-13CCC

DATE DRILLED: 7/28/78

ALTITUDE: (FT, NGVD) 1512

DEPTH: (FT) 160



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-14 Sand, very fine to fine; about 30 percent silt; subrounded; oxidized.

14-38 Clay, dark-gray, silty, sandy.

38-70 Till, dark-gray, silty, pebbly; very sandy to 55 feet.

70-76 Sand, medium to very coarse, predominantly medium, subrounded to rounded.

76-82 Till, dark-gray, very sandy to gravelly.

82-99 Gravel, fine; about 30 percent medium to very coarse sand; subangular to rounded; silty to clayey from 82 to 86 feet.

99-124 Till, dark-gray, very silty, sandy, pebbly.

124-131 Gravel, fine to medium; about 30 percent medium to coarse sand; subangular to subrounded.

FOX HILLS SANDSTONE

131-160 Sandstone, light-gray, very fine, clayey; interbedded with dark-brown clayey carbonaceous moderately well indurated siltstone.

157-078-23DDD
NDSWC 10164

Altitude: 1505 feet — Date drilled: 7/28/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine; about 30 percent silt; oxidized	15	15
	Clay, yellowish-brown, silty, sandy, oxidized; abundant detrital lignite	13	28
	Clay, dark-gray, silty, sandy	8	36
	Silt, dark-gray, clayey, sandy	21	57
	Till, dark-gray, very silty, sandy	20	77
	Sand, very fine to medium, silty, clayey	14	91
	Till, dark-gray, silty, sandy	23	114
	Gravel, fine to medium; about 10 percent fine to very coarse sand; subangular to rounded	20	134
	Till, dark-gray, silty, sandy, pebbly	5	139
	Gravel, fine to medium; about 30 percent medium to very coarse sand; subangular to subrounded	11	150
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine, silty, clayey, moderately indurated	30	180

157-078-25CCC
NDSWC 10165

Altitude: 1492 feet — Date drilled: 7/31/78

Glacial drift:			
	Sand, very fine to fine, silty, subrounded, oxidized	4	4
	Clay, yellowish-brown, silty, sandy, oxidized	8	12
	Till, medium-dark-gray, silty; with thin lenses of sandy gravel	26	38
	Sand, very fine to very coarse; about 10 percent fine to medium gravel; subrounded to rounded; abundant detrital lignite	14	52
	Till, dark-gray, very silty and sandy, pebbly	28	80
	Gravel, fine; about 20 percent coarse silty sand; angular to subrounded	9	89
	Till, dark-gray, silty, sandy, pebbly	21	110
Fox Hills Sandstone:			
	Sandstone, medium-gray, very fine; interbedded with medium-brown clayey carbonaceous moderately indurated siltstone	10	120

157-078-27AAA
NDSWC 5864

Altitude: 1500 feet — Date drilled: 10/14/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, very sandy	1	1
	Sand, very fine to fine, subangular to rounded, oxidized	2	3
	Clay, dusky-yellowish-brown, very silty, oxidized, mottled	17	20
	Clay, olive-gray, very silty, calcareous	28	48
	Till, dark-gray, silty, pebbly	4	52
	Gravel, fine to medium, sandy, angular to subrounded	2	54
	Till, dark-gray, silty, gravelly	42	96
	Sand, fine to medium, subangular to rounded	2	98
	Till, dark-gray, silty, pebbly; some cobbles	23	121
Fox Hills Sandstone:			
	Shale, greenish-gray, moderately indurated; with grayish-brown carbonaceous lenses	19	140

157-079-04DDC
(Log modified from Farmers Supply Company)

Date drilled: 8/30/76

	Sand	9	9
	Yellow sandy clay	18	27
	Gray clay till	25	52
	Gray clay; with small sand layers	16	68
	Gray clay till	34	102
Fox Hills Sandstone:			
	Gray sand	9	111
	Gray hard clay	27	138
	Grayish-green sand	20	158
	Gray hard clay	20	178
	Gray sand	40	218
	Gray hard clay	4	222

157-079-15DDC
(Log modified from Verne R. Peterson Well Drilling)

Date drilled: 10/12/76

	Sandy clay	8	8
	Fine sand	28	36
	Sandy till; lignite chips	50	86
	Gravel	1	87
	Sandy till	7	94
	Gravel	2	96
	Sandy till	4	100
Fox Hills Sandstone:			
	Coal	3	103

157-079-23BBB
NDSWC 5869

Altitude: 1490 feet — Date drilled: 10/15/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Clay, dusky-yellow, very silty, oxidized	17	18
	Clay, olive-gray, very silty, sandy	13	31
	Till, dark-gray, silty, pebbly; some cobbles	65	96
Fox Hills Sandstone:			
	Shale, dark-grayish-brown, carbonaceous; interbedded with greenish-gray very fine clayey moderately indurated sandstone	24	120

157-079-29CCC
NDSWC 10137

Altitude: 1500 feet — Date drilled: 7/19/78

Glacial drift:			
	Till, yellowish-brown, silty, sandy, oxidized	15	15
	Till, dark-gray, silty, sandy, pebbly	39	54
	Sand, very fine to very coarse, predominantly medium, subrounded to rounded	10	64
	Clay, dark-gray, silty, sandy	4	68
	Sand, very fine to very coarse, subangular to rounded	9	77
	Till, dark-gray, silty; with thin lenses of coarse sand	33	110
Fox Hills Sandstone:			
	Siltstone, dark-brown, clayey, carbonaceous; interbedded with light-gray very fine clayey poorly indurated sandstone	10	120

157-080-03DDD
NDSWC 1389

Altitude: 1500 feet — Date drilled: 9/13/58

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, gravelly	33	34
	Till, dark-gray, gravelly, pebbly	12	46
	Gravel, fine, and coarse sand	6	52
	Till, dark-gray, gravelly	22	74
Hell Creek Formation(?):			
	Shale, dark-gray, sandy	10	84

157-080-07CAA
(Log from Mariner Drilling Service)

Date drilled: 5/22/75

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Surface	2	2
	Yellow clay	8	10
	Yellow clay and sand	7	17
	Blue clay	23	40
	Sand; some water	2	42
	Blue clay; sand streaks	23	65
	Blue clay	5	70

157-080-07CAD
(Log from Mariner Drilling Service)

Date drilled: 5/22/75

	Surface	2	2
	Dry sand	3	5
	Yellow clay	14	19
	Gravel	2	21
	Blue clay	9	30
	Coarse gravel	2	32
	Blue clay	8	40
	Gravel	2	42
	Blue clay; sand streaks	28	70

157-080-11CCC
NDSWC 5870

Altitude: 1505 feet

Date drilled: 10/15/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, pebbly	21	22
	Till, olive-gray, silty, gravelly; some cobbles	18	40
	Sand, fine to very coarse, gravelly, subangular to rounded	7	47
	Till, dark-gray, silty, pebbly; occasional thin lens of sandy gravel	60	107
Fox Hills Sandstone:			
	Sandstone, bluish-gray, very fine to fine, moderately indurated; with dark-grayish-brown carbonaceous clay layers	13	120

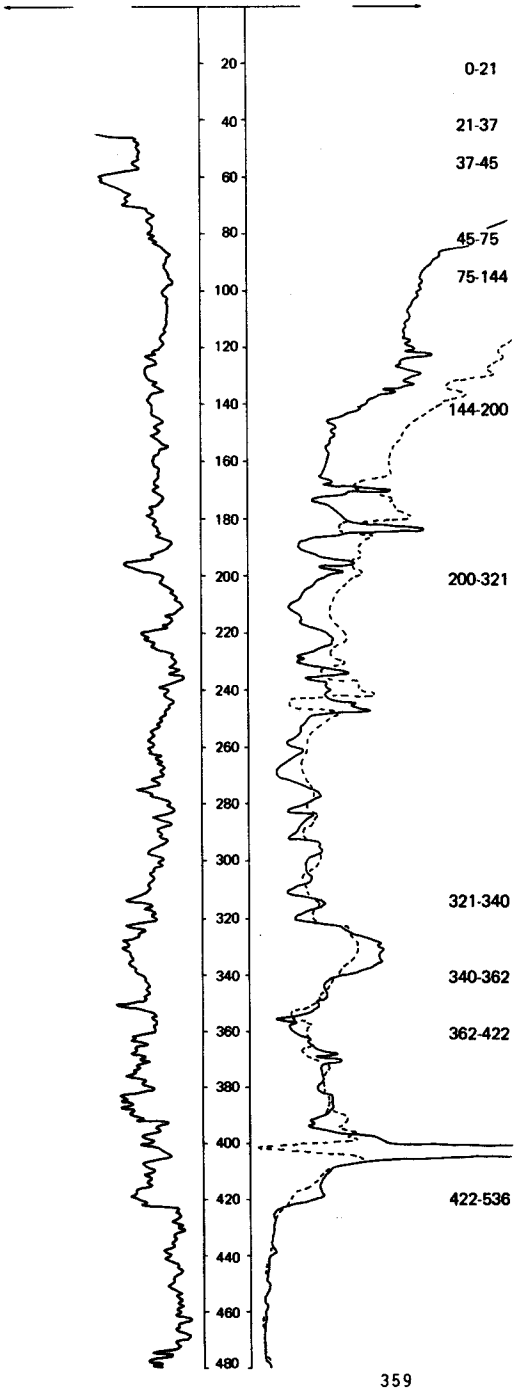
NDSWC 4978, 4978A

LOCATION: 157-080-18DDD1, 2

DATE DRILLED: 9/14/76

ALTITUDE: 1535 (FT, NGVD)

DEPTH: 560 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-21 Till, yellowish-brown, sandy, pebbly, oxidized.

21-37 Till, olive-gray, silty, sandy, pebbly.

37-45 Sand, fine to very coarse; about 30 percent fine to coarse gravel; angular to subrounded.

45-75 Till, olive-gray, silty, sandy, pebbly.

75-144 Till, dark-gray, very sandy; with lenses of fine gravel from 120 to 144 feet.

HELL CREEK FORMATION

144-200 Shale, light-gray, sandy, indurated; interbedded with dark-gray clayey siltstone; gray fine sandstone from 182 to 184 and 194 to 195 feet.

200-321 Shale, brownish-gray, carbonaceous to lignitic; interbedded with gray sandy siltstone; greenish-gray fine clayey sandstone from 244 to 246 feet.

FOX HILLS SANDSTONE

321-340 Sandstone, light-greenish-gray, fine, glauconitic, bentonitic.

340-362 Shale, dark-brownish-gray, silty, carbonaceous, brittle.

362-422 Sandstone, medium-greenish-gray, very fine to fine, glauconitic, micaceous; moderately indurated to well indurated from 399 to 406 feet.

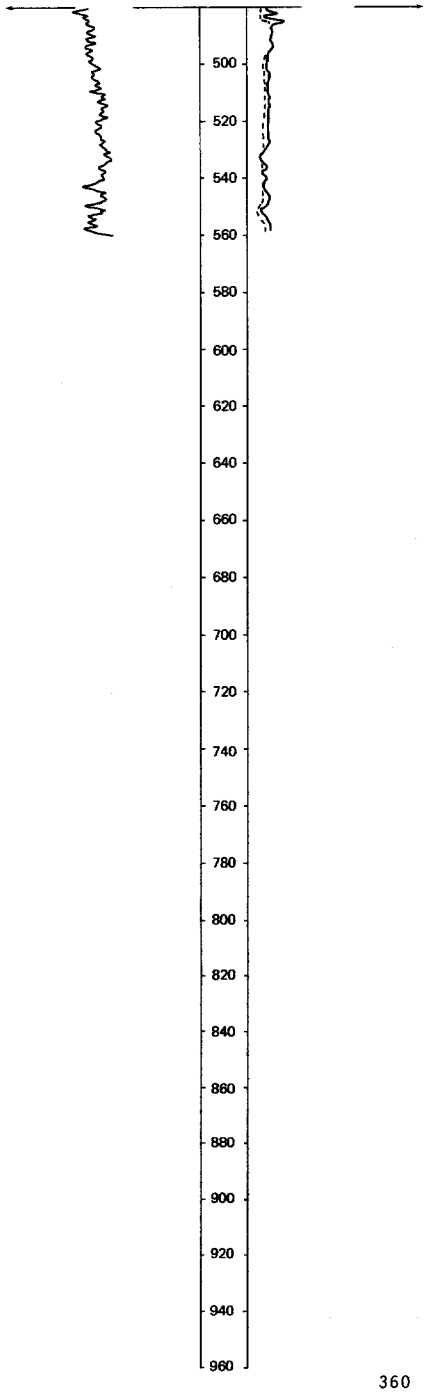
422-536 Shale, medium-dark-gray, silty, very bentonitic, very tight, sticky.

LOCATION: 157-080-18DDD1, 2

DATE DRILLED: 9/14/76

ALTITUDE: 1535
(FT, NGVD)

DEPTH: 560
(FT)



DESCRIPTION OF DEPOSITS

PIERRE SHALE

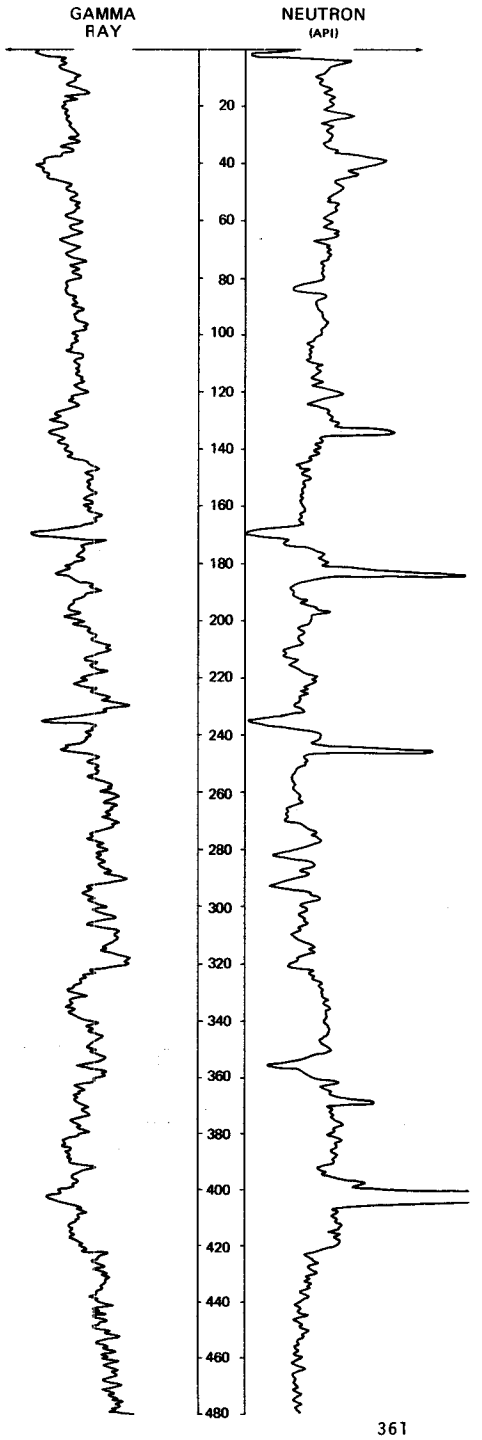
536-560 Shale, grayish-black, siliceous, brittle, moderately indurated.

LOCATION: 157-080-18DDD1, 2

DATE DRILLED: 9/14/76

ALTITUDE: 1535
(FT, NGVD)

DEPTH: 560
(FT)



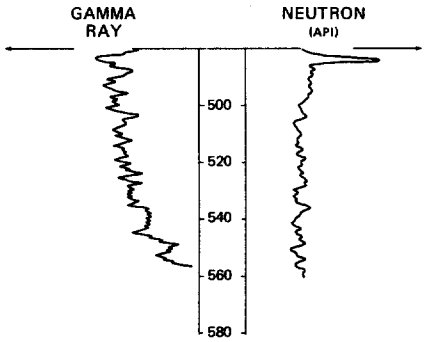
DESCRIPTION OF DEPOSITS

LOCATION: 157-080-18DDD1, 2

DATE DRILLED: 9/14/76

ALTITUDE: 1535 (FT, NGVD)

DEPTH: 560 (FT)



DESCRIPTION OF DEPOSITS

157-080-35ACD
(Log modified from Water Supply Inc.)

Date drilled: 7/02/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black silty topsoil	1	1
	Fine to medium to coarse gravel; about 30 percent sand	13	14
	Olive-gray silty clay (till)	26	40

157-080-35DBA
(Log modified from Water Supply Inc.)

Date drilled: 7/02/76

	Black silty topsoil	0.5	0.5
	Fine to medium to coarse gravel; about 20 percent sand	9.5	10
	Fine to medium to coarse sand	8.5	18.5
	Olive-gray silty clay	21.5	40
	Olive-gray silty clay (till)	38	78
	Fine to medium to coarse gravel	2	80
Fox Hills Sandstone:			
	Bluish-gray to medium-gray silty clay	40	120
	Bedrock; with small coal layers	----	120

157-080-35DBC
(Log modified from Water Supply Inc.)

Date drilled: 7/02/76

	Black silty topsoil	0.5	0.5
	Fine to medium to coarse gravel; about 30 percent fine to medium to coarse sand	26.5	27
	Olive-gray silty clay (till)	13	40

157-080-36CBA
(Log modified from Farmers Supply Company)

Date drilled: 7/22/71

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sandy topsoil	3	3
	Yellow clay; with sand and gravel	27	30
	Yellow clay; with coarse gravel	15	45
	Fine to coarse gravel	27	72
	Clay and gravel	1	73
	Fine to coarse gravel	7	80
	Medium gravel	16	96
	Medium gravel and clay	4	100
Fox Hills Sandstone:			
	Fine sand and clay	5	105

157-080-36CBB
NDSWC 10139

Altitude: 1509 feet — Date drilled: 7/24/78

Glacial drift:			
	Gravel, fine to medium, predominantly fine; about 20 percent fine to very coarse sand; subrounded to rounded; oxidized	12	12
	Till, dark-gray, silty, pebbly; sandy to occasional lenses of gravelly sand	58	70
	Till, dark-gray, sandy, pebbly	39	109
Fox Hills Sandstone:			
	Siltstone, medium-brown, clayey, carbonaceous; interbedded with greenish-gray fine clayey moderately to well indurated sandstone	11	120

158-075-07DDA
(Log modified from North Dakota Geological Survey)

Altitude: 1453 feet — Date drilled: 7/16/70

	Sand, gray	4	4
	Sand, medium to coarse	5	9
	Sand, brown, fine, oxidized	3	12
	Sand, gray, fine	1	13
	Sand, medium, well-sorted, fairly uniform	21	34
	Till, gray	----	34

158-075-09DDD
NDSWC 10177

Altitude: 1481 feet — Date drilled: 8/08/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellowish-brown, sandy; about 25 percent silt; oxidized	7	7
	Clay, dark-brownish-gray, sandy; about 30 percent silt	27	34
	Clay, dark-gray, silty, sandy	34	68
	Till, dark-gray, silty, sandy, pebbly; some cobbles	28	96
	Till, dark-gray, very silty, sandy, pebbly	25	121
Fox Hills Sandstone:			
	Siltstone, dark-grayish-brown, clayey, moderately indurated	39	160

158-075-12ABC
(Log modified from Church Well Boring)

Date drilled: 10/18/76

Black topsoil	1	1
Bluish-yellow sand	12	13
Blue coarse sand	1	14
Blue clay	16	30

158-075-21BBB
NDSWC 10051

Altitude: 1465 feet — Date drilled: 11/02/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized	11	12
	Sand, fine to medium, subrounded	20	32
	Clay, dark-gray, very silty	11	43
	Till, dark-gray, silty, sandy	45	88
	Sand, fine to medium, subrounded, silty; clay lenses	21	109
Fox Hills Sandstone:			
	Sandstone, light-gray, fine, silty, moderately indurated	2	111
	Siltstone, medium-gray, clayey, moderately indurated	9	120

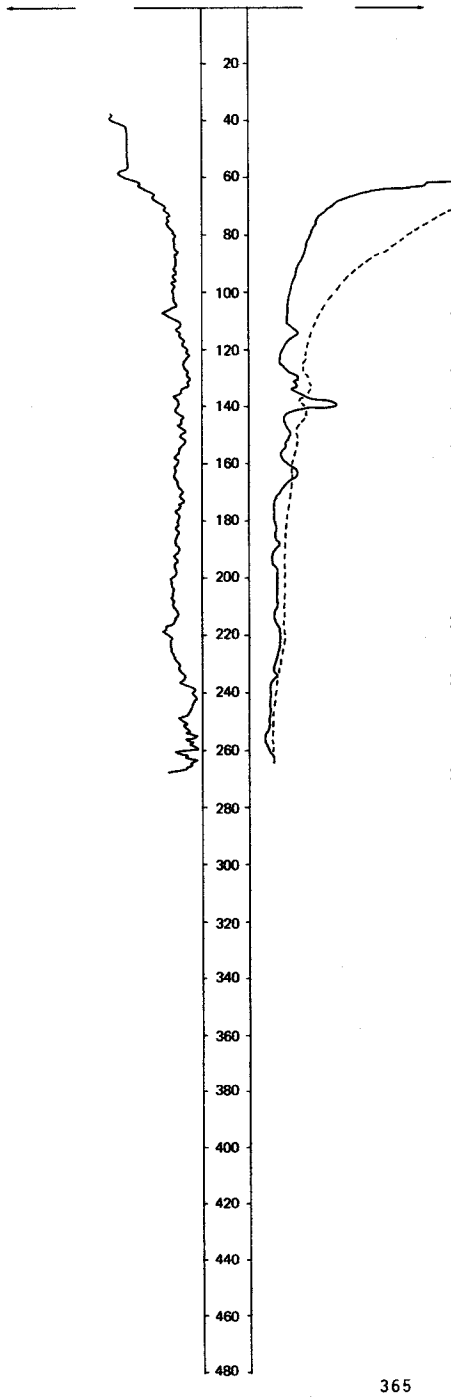
NDSWC 4984

LOCATION: 158-075-22AAA

DATE DRILLED: 9/21/76

ALTITUDE: 1475 (FT, NGVD)

DEPTH: 300 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-30	Sand, very fine to coarse, subrounded, oxidized.
30-40	Sand, very fine to medium, silty to clayey, subrounded.
40-46	Sand, fine to medium, silty, subrounded.
46-62	Clay, dark-gray, silty.
62-112	Till, dark-gray, silty, sandy, pebbly.
112-118	Sand, fine to medium, silty, subrounded.
118-134	Till, dark-gray, silty, sandy, pebbly.
134-141	Sand, fine to medium, subrounded.
141-160	Till, dark-gray, silty, pebbly.
160-168	Sand, fine to coarse, gravelly, subrounded.

FOX HILLS SANDSTONE

168-216	Siltstone, medium-dark-gray, clayey.
216-230	Sandstone, greenish-gray, fine, clayey, moderately indurated.
230-238	Siltstone, dark-gray, clayey, bentonitic.

PIERRE SHALE(?)

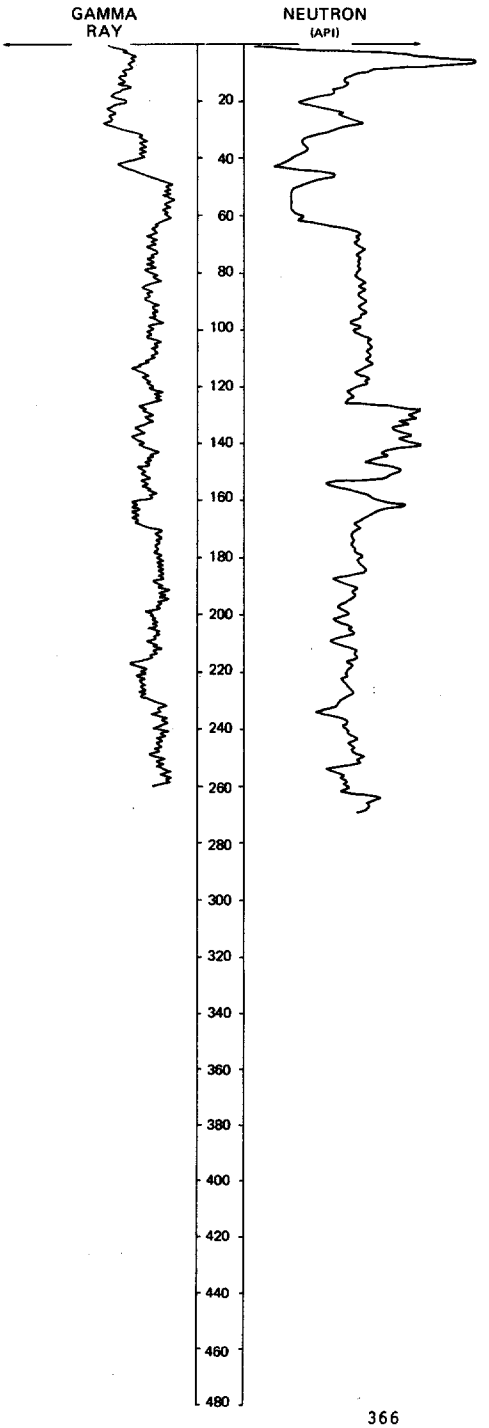
238-300	Shale, dark-gray, very silty; poor sample return.

LOCATION: 158-075-22AAA

DATE DRILLED: 9/21/76

ALTITUDE: 1475
(FT, NGVD)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

158-075-26BBB
NDSWC 10176

Altitude:	1466 feet	Date drilled:	8/08/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine, silty, clayey, oxidized	3	3
	Sand, very fine to medium, subrounded to rounded; oxidized to 9 feet	17	20
	Silt, dark-grayish-brown; about 30 percent clay	8	28
	Clay, dark-gray; about 30 percent silt and 30 percent sand; carbonaceous streaks	10	38
	Clay, dark-gray, silty, sandy	30	68
	Till, dark-gray, silty; with lenses of sand and gravel	28	96
Fox Hills Sandstone:			
	Siltstone, dark-grayish-brown, clayey; carbonaceous streaks	24	120

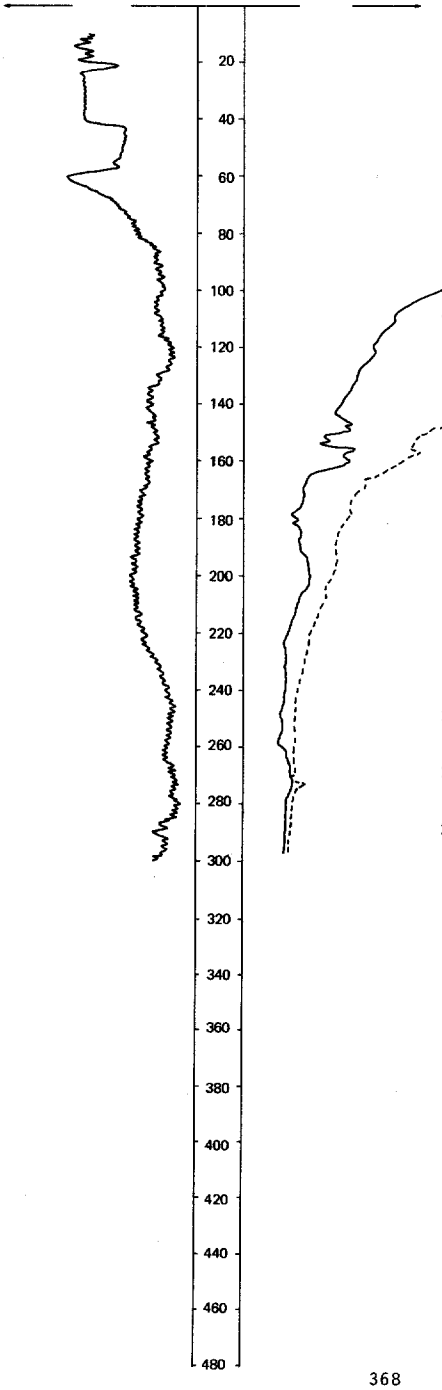
NDSWC 4983

LOCATION: 158-076-13BCB

DATE DRILLED: 9/21/76

ALTITUDE: 1452 (FT, NGVD)

DEPTH: 300 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-28	Sand, fine to very coarse, sub-angular to rounded; oxidized to 10 feet.
28-44	Till, olive-gray, silty, sandy, pebbly.
44-78	Till, dark-gray, silty, sandy, pebbly.

FOX HILLS SANDSTONE

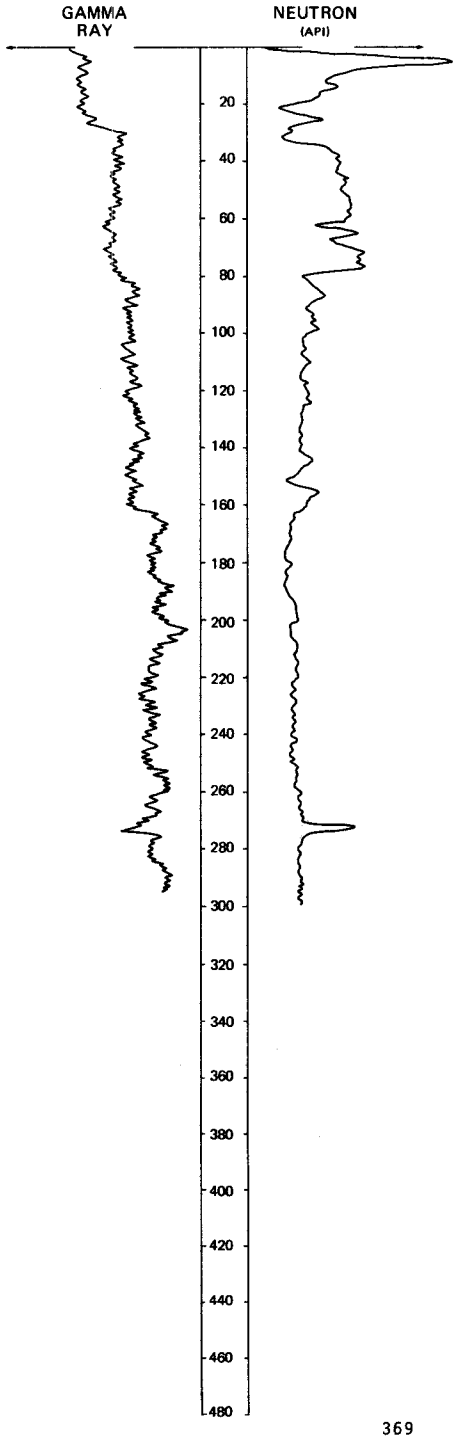
78-142	Shale, light-brownish-gray, silty, slightly carbonaceous.
142-162	Sandstone, dark-green, fine, glauconitic.
162-210	Shale, brownish-gray, carbonaceous; silty to sandy intervals.
210-232	Siltstone, greenish-gray, clayey, bentonitic.
232-252	Shale, brownish-gray, silty; carbonaceous streaks.
252-272	Siltstone, dark-brownish-gray, clayey; carbonaceous streaks.
272-274	Limestone, light-gray, indurated, calcareous.
274-300	Shale, dark-grayish-black, bentonitic, tight, sticky.

LOCATION: 158-076-13BCB

DATE DRILLED: 9/21/76

ALTITUDE: 1452
(FT, NGVD)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

158-076-14CDC
NDSWC 10045

Altitude: 1440 feet — Date drilled: 11/02/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Topsoil, brownish-black, sandy	1	1
	Sand, fine to medium, silty, oxidized	4	5
	Clay, greenish-gray, very silty; about 30 percent detrital lignite	18	23
	Sand, fine, subangular; about 50 percent detrital lignite	18	41
Fox Hills Sandstone:			
	Siltstone, medium-brownish-gray, clayey; some carbonaceous streaks	19	60

158-076-14DBD
NDSWC 10046

Altitude: 1440 feet — Date drilled: 11/02/77

Alluvium:			
	Topsoil, brownish-black	1	1
	Silt, yellowish-brown, clayey, oxidized	11	12
	Silt, dark-gray, clayey; green mottling	22	34
	Clay, dark-gray, silty; abundant detrital lignite	9	43
	Sand, fine to medium, silty, subrounded	1	44
Fox Hills Sandstone:			
	Siltstone, medium-brownish-gray, clayey; carbonaceous streaks	16	60

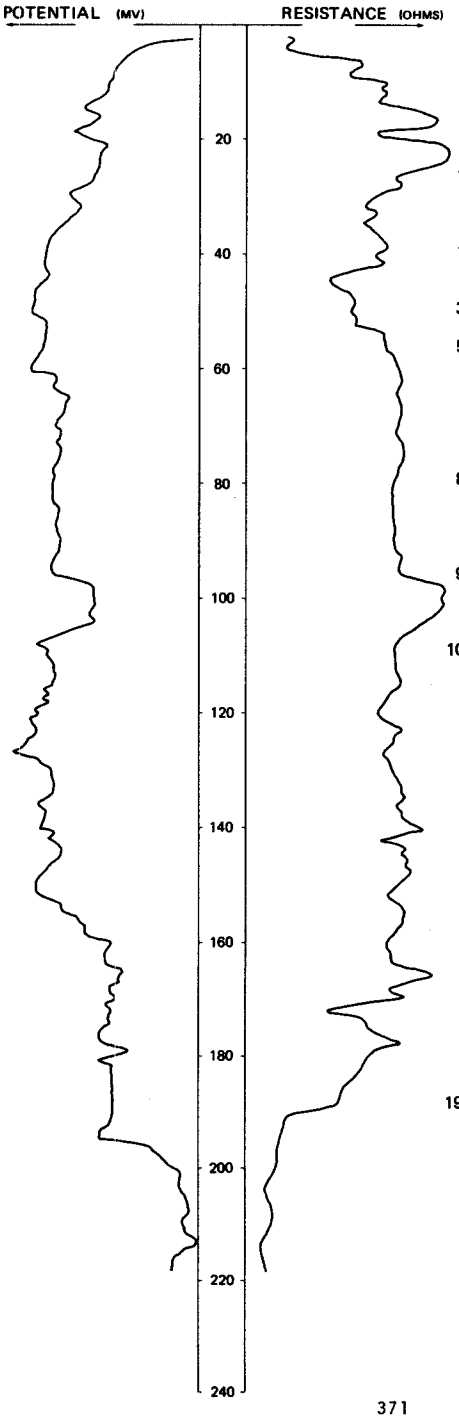
NDSWC 10159

LOCATION: 158-076-20BBB

DATE DRILLED: 7/27/78

ALTITUDE: (FT, NGVD) 1456

DEPTH: (FT) 220



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-14	Sand, very fine to fine, subrounded to rounded; oxidized to 7 feet; small mollusk shells.
14-18	Silt, dark-brownish-gray; about 30 percent clay and 20 percent very fine sand.
18-30	Sand, very fine, subrounded to rounded, well-sorted.
30-52	Silt, dark-gray, clayey, sandy.
52-80	Sand, very fine, subrounded to rounded; about 30 percent silt.
80-96	Silt, dark-gray, clayey, sandy.
96-103	Sand, very fine to fine, subrounded; about 20 percent clay and 20 percent silt.
103-190	Till, dark-gray, sandy, pebbly; with lenses of sandy gravel from 124 to 127, 144 to 146, 162 to 166, and 178 to 180 feet.

FOX HILLS SANDSTONE

190-220	Shale, dark-grayish-brown, carbonaceous, very compact, brittle.

158-076-21AAB
NDSWC 10044

Altitude: 1440 feet — Date drilled: 11/01/77

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, fine to medium, silty, oxidized	16	17
	Clay, dark-gray, silty	22	39
	Sand, very fine to fine, silty	2	41
	Till, dark-gray, silty, sandy, pebbly	8	49
Fox Hills Sandstone:			
	Siltstone, grayish-brown, clayey, moderately indurated; carbonaceous in parts	31	80

158-077-05DDD
NDSWC 10157

Altitude: 1460 feet — Date drilled: 7/27/78

Glacial drift:			
	Sand, very fine to fine, silty, subrounded to rounded, oxidized	17	17
	Clay, olive-gray; about 20 percent silt and 30 percent very fine to fine sand	23	40
	Silt, dark-grayish-brown; about 30 percent clay and 20 percent coarse detrital lignitic sand	15	55
	Till, dark-gray, silty, sandy, pebbly	31	86
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine, clayey, poorly indurated	10	96
	Siltstone, grayish-brown, clayey, moderately indurated	24	120

158-077-06ADD
(Log from Virg's Well Drilling)

Altitude: 1455 feet — Date drilled: 10/25/74

	Topsoil	1	1
	Sand	16	17
	Blue clay	---	17

158-077-08DDD
USBR test hole
(Log modified from Paulson and Powell, 1957)

Altitude: 1460 feet — Date drilled: 1/01/50

	Topsoil, sandy	1	1
	Sand, brown, silty	9	10
	Sand, gray, fine, silty	23	33
	Silt and clay, gray	12	45
	Till, gray	5	50

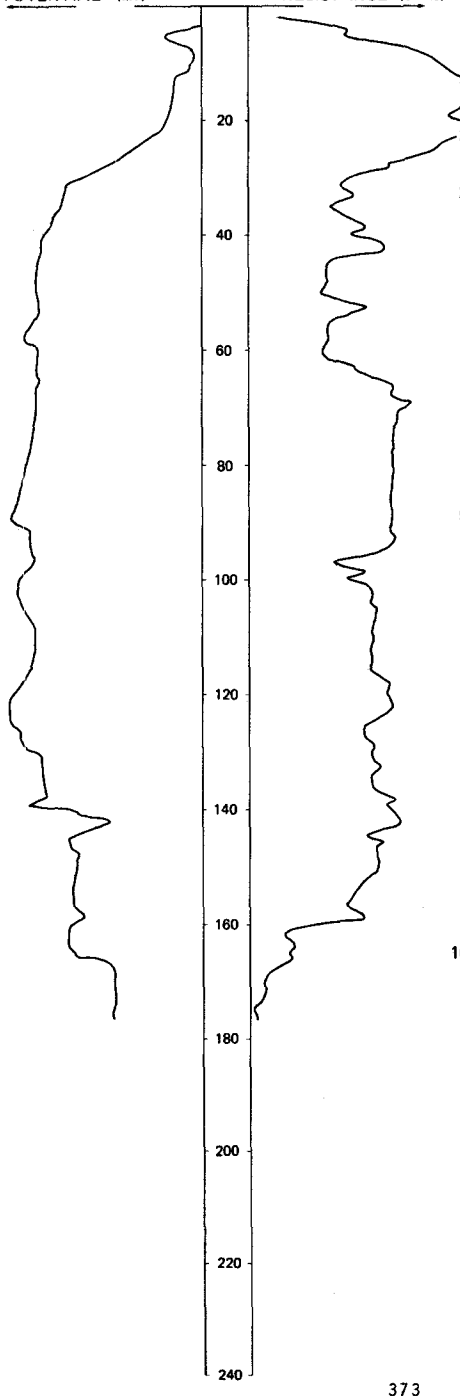
NDSWC 10158

LOCATION: 158-077-11BBB

DATE DRILLED: 7/27/78

ALTITUDE: (FT, NGVD) 1457

DEPTH: (FT) 180



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-20 Sand, very fine to medium, silty, subrounded to rounded, oxidized.

20-28 Sand, fine to coarse, subrounded to rounded.

28-92 Clay, dark-gray; about 20 percent silt; thin lenses of sand and detrital lignite.

92-164 Till, dark-gray, silty, sandy, pebbly.

FOX HILLS SANDSTONE

164-180 Siltstone, dark-brownish-black, clayey, carbonaceous, moderately indurated.

158-077-21BBB
NDSWC 5875

Altitude: 1460 feet — Date drilled: 10/16/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Sand, very fine, silty, subangular, oxidized	2	3
	Clay, yellowish-brown, very silty, oxidized	12	15
	Clay, dark-gray, very silty, calcareous; olive-gray mottling	22	37
	Till, dark-gray, silty, pebbly; some cobbles	47	84
	Sand, fine to very coarse, gravelly, subangular to rounded	2	86
	Till, dark-gray, silty; occasional thin lenses of sandy gravel	26	112
Fox Hills Sandstone:			
	Shale, brownish-gray, carbonaceous; interbedded with greenish-gray fine clayey moderately indurated sandstone	28	140

158-077-23BBB
NDSWC 10043

Altitude: 1455 feet — Date drilled: 11/01/77

Glacial drift:			
	Topsoil, brownish-black	1	1
	Silt, yellowish-brown, clayey, oxidized	7	8
	Silt, medium-gray, clayey, slightly sandy	44	52
	Till, dark-gray, silty, sandy; lignite fragments	13	65
	Sand, coarse; about 25 percent fine gravel; subangular to rounded	8	73
	Till, dark-gray, silty, sandy; with cobbles and gravel from 82 to 85 feet	12	85
Fox Hills Sandstone:			
	Siltstone, grayish-green, clayey, moderately indurated	15	100

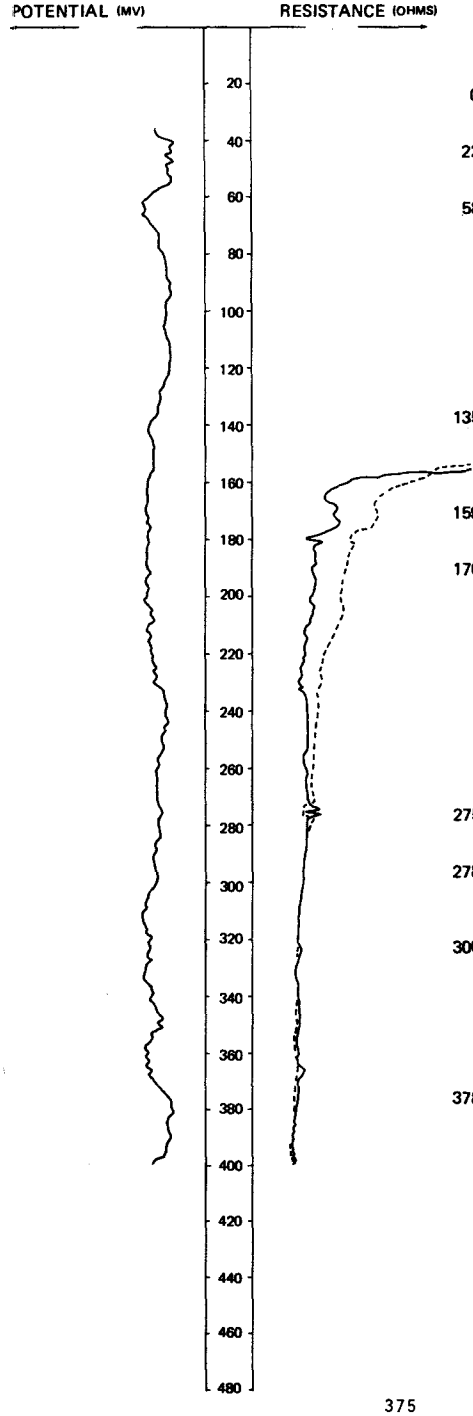
NDSWC 4982

LOCATION: 158-077-24AAA

DATE DRILLED: 9/20/76

ALTITUDE: 1455 (FT, NGVD)

DEPTH: 400 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-22 Sand, very fine to fine, subrounded to rounded; oxidized to 10 feet.

22-58 Clay, dark-gray, silty, moderately sandy.

58-135 Till, dark-olive-gray, silty, pebbly; with numerous thin lenses of sand and gravel.

135-159 Sand, fine to coarse, gravelly, subrounded to rounded.

FOX HILLS SANDSTONE

159-176 Sandstone, dark-greenish-gray, fine, clayey, moderately indurated.

176-275 Shale, dark-gray; interbedded with lenses of dark-gray clayey moderately indurated siltstone; some carbonaceous streaks.

275-278 Sandstone, greenish-gray, fine, clayey, indurated.

278-300 Shale, dark-brownish-gray; interbedded with dark-gray clayey moderately indurated silstone.

300-378 Shale, dark-grayish-black, bentonitic; interbedded with dark-brownish-gray slightly carbonaceous bentonitic sticky siltstone.

PIERRE SHALE

378-400 Shale, grayish-black to black, siliceous, brittle, indurated.

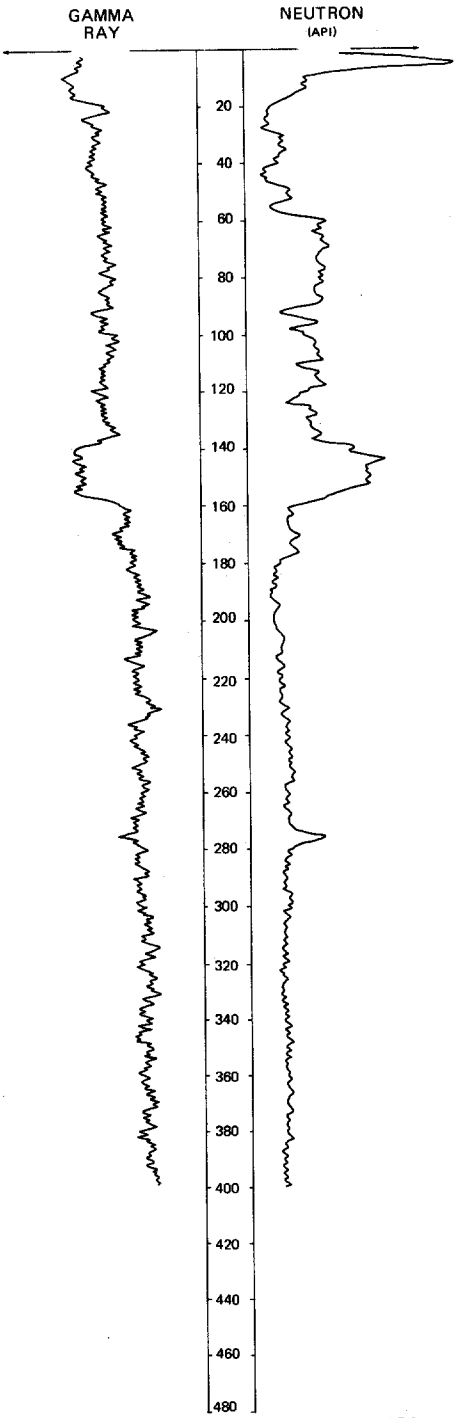
LOCATION: 158-077-24AAA

DATE DRILLED: 9/20/76

ALTITUDE: 1455
(FT, NGVD)

DEPTH: 400
(FT)

DESCRIPTION OF DEPOSITS



158-078-08CBA1
(Log modified from Farmers Supply Company)

Date drilled: 8/02/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil sand	4	4
	Yellow sandy clay	20	24
	Gray soft clay till	36	60
	Gray clay; with gravel layers	30	90
	Gray hard clay	8	98

158-078-08CBA2
(Log modified from Farmers Supply Company)

Altitude: 1450 feet — Date drilled: 8/19/76

	Sand	25	25
	Yellow sandy clay	12	37
	Gray soft clay	24	61
	Gray hard clay; with small sand layers	41	102
Fox Hills Sandstone:			
	Green sandy clay	19	121
	Gray hard clay	39	160
	Sand layers; with gray clay	20	180

158-078-11DDD
NDSWC 10155

Altitude: 1450 feet — Date drilled: 7/27/78

Glacial drift:			
	Sand, very fine to fine; about 30 percent silt; oxidized	6	6
	Clay, yellowish-brown, silty, sandy, oxidized	7	13
	Clay, dark-olive-gray, silty	7	20
	Sand, very fine to medium, silty, subrounded	4	24
	Clay, dark-gray, silty	26	50
	Till, dark-gray, silty, very sandy, pebbly	26	76
	Till, dark-gray, silty, pebbly	23	99
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine, clayey, indurated	6	105
	Siltstone, grayish-brown, clayey, carbonaceous, moderately indurated	15	120

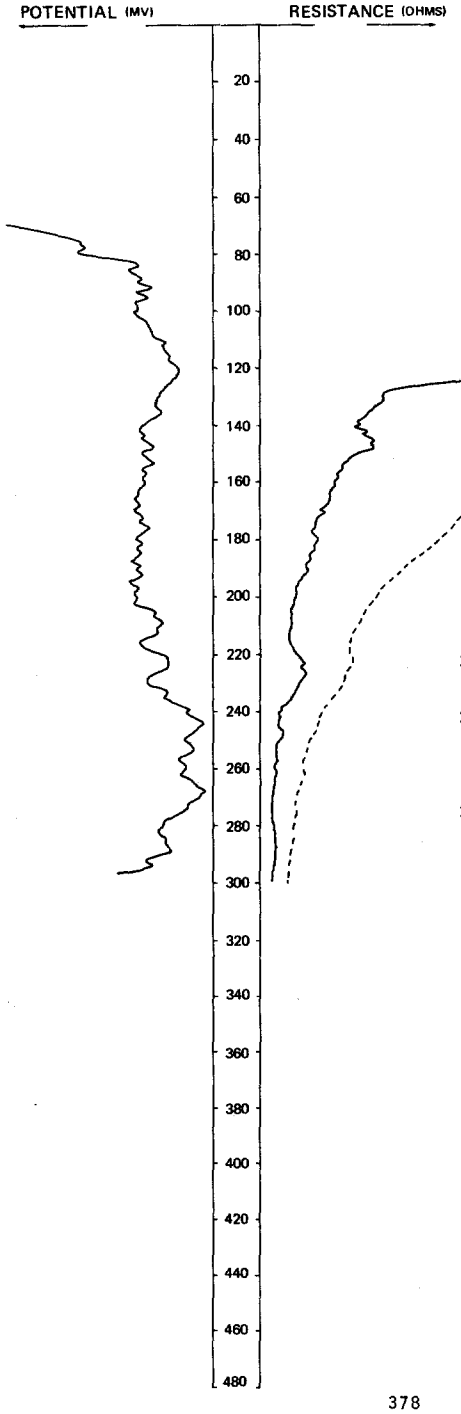
NDSWC 4981, 4981A

LOCATION: 158-078-13DDD1, 2

DATE DRILLED: 9/17/76

ALTITUDE: 1455 (FT, NGVD)

DEPTH: 300 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-13	Sand, very fine to fine, subrounded to rounded; oxidized to 10 feet.
13-61	Clay, dark-olive-gray, silty, sandy.
61-81	Sand, fine to coarse; about 40 percent fine to coarse gravel; subangular to rounded; mostly carbonates.
81-96	Till, dark-gray, silty, sandy, pebbly.

FOX HILLS SANDSTONE

96-126	Shale, light-gray, very silty, sandy; interbedded with brownish-gray clayey carbonaceous moderately indurated siltstone.
126-142	Shale, bluish-gray, silty, tight.
142-150	Sandstone, greenish-gray, fine, moderately indurated to well indurated.
150-220	Siltstone, medium-brownish-gray, clayey, moderately indurated; carbonaceous streaks.
220-238	Sandstone, dark-greenish-gray, very fine, clayey; carbonaceous streaks.
238-278	Shale, dark-gray, silty, bentonitic.

PIERRE SHALE

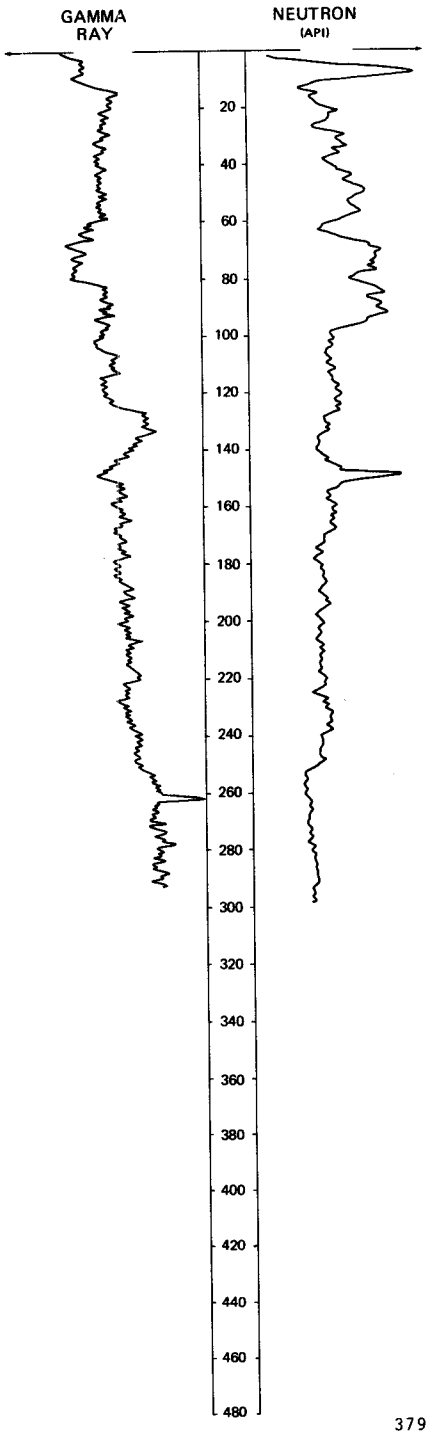
278-300	Shale, black, siliceous, brittle, indurated; thin seams of bentonite.

LOCATION: 158-078-13DDD1, 2

DATE DRILLED: 9/17/76

ALTITUDE: 1455
(FT, NGVD)

DEPTH: 300
(FT)



DESCRIPTION OF DEPOSITS

158-078-14CCB
NDSWC 10154

Altitude: 1450 feet — Date drilled: 7/26/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellowish-brown, silty, oxidized	10	10
	Clay, dark-gray, silty	32	42
	Till, dark-gray, silty, sandy, pebbly	65	107
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine, clayey; interbedded with brownish-gray clayey carbonaceous poorly indurated siltstone	13	120

158-078-15CCC
USBR test hole
(Log modified from Paulson and Powell, 1957)

Altitude: 1442 feet

	Topsoil, sandy	2	2
	Clay, buff, sandy	3	5
	Clay, light-brown, silty, sandy	14	19
	Clay, gray, plastic	16	35
	Till, gray	17	52
	Sand, gray, fine; with coarse gravel	8	60
	Till, gray	26	86
Fox Hills Sandstone:			
	Sand, gray, silty, compact	64	150

158-078-15DCC
USBR test hole
(Log modified from Paulson and Powell, 1957)

Altitude: 1452 feet

	Topsoil, sandy	2	2
	Sand, buff, fine	3	5
	Sand and silt, buff	9	14
	Clay, gray, plastic	39	53
	Till, gray	34	87
Fox Hills Sandstone:			
	Sand, gray, silty, compact	65	152

158-078-16DDD
NDSWC 10153

Altitude: 1440 feet — Date drilled: 7/26/78

	Clay, yellowish-brown, silty, oxidized	12	12
	Clay, olive-gray; about 20 percent silt	12	24
	Till, dark-gray, silty, sandy, gravelly; some thin lenses of gravel and cobbles	56	80
Fox Hills Sandstone:			
	Siltstone, dark-brown, clayey, carbonaceous; interbedded with brownish-gray moderately indurated tight shale	32	112
	Sandstone, greenish-gray, very fine, clayey, indurated	8	120

158-078-20BBB
NDSWC 5874

Altitude: 1462 feet — Date drilled: 10/16/70

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, very fine to fine, silty, subangular to rounded, oxidized	13	14
	Clay, olive-gray, silty; with grayish-black mottling	36	50
	Till, olive-gray, silty, pebbly; occasional cobbles	61	111
Fox Hills Sandstone:			
	Shale, medium-gray, sandy, moderately indurated	9	120

158-078-20DAD
(Log modified from Christenson & Olson)

Altitude. 1460 feet — Date drilled. 10/14/72

	Black topsoil	1	1
	Sand	18	19

158-078-26AAA
NDSWC 10358

Altitude: 1455 feet — Date drilled: 10/31/78

Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, oxidized	13	14
	Clay, dark-gray, silty, cohesive	46	60
	Till, dark-gray, silty, pebbly	31	91
	Sand, fine to medium, gravelly, subrounded to rounded	3	94
	Till, dark-gray, silty, sandy, pebbly	11	105
Fox Hills Sandstone:			
	Sandstone, greenish-gray, very fine to medium, predominantly medium, clayey, moderately indurated	15	120

158-078-31ABB
(Log modified from Frederickson's Inc.)

Altitude: 1460 feet — Date drilled: 1/01/69

	Brown topsoil	14	14
	Gray sand	41	55
	Blue clay	10	65
	Brown sand and gravel	25	90
	Blue sandy clay; lensed with gravel	23	113
	Brown sand	7	120
	Gray clay bedrock	12	132

158-078-31ACB
(Log modified from Frederickson's Inc.)

Date drilled: 1/01/69

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Black topsoil	1	1
	Brown fine sand	14	15
	Blue fine sand	18	33
	Blue clay	34	67
	Brown sand	15	82
	Brown coarse gravel	24	106
	Blue clay	2	108

158-078-31ACC
(Log modified from Frederickson's Inc.)

Altitude: 1490 feet

Date drilled: 1/01/69

	Black topsoil	1	1
	Brown fine sand	13	14
	Blue fine sand	23	37
	Blue clay	30	67
	Blue fine sand	33	100
	Blue very sandy clay	16	116
	Brown sand and gravel	2	118
	Blue and brown very sandy soft clay; with boulders	14	132
	Brown sand and gravel	31	163
	Clay, light-gray; possibly bedrock	17	180

158-078-31ADB
(Log modified from Frederickson's Inc.)

Date drilled: 1/01/69

	Black topsoil	10	10
	Gray sand	32	42
	Gray sand; lensed with clay	15	57
	Brown sand	4	61
	Blue sandy clay; with lenses of sand	41	102
	Sand	10	112
	Blue dirty sand	15	127
	Brown sand	6	133
	White rock	2	135

158-078-31BCA
(Log modified from Frederickson's Inc.)

Date drilled: 1/01/69

	Black topsoil	1	1
	Brown fine sand	9	10
	Blue fine sand	30	40
	Blue clay	32	72
	Brown gravel	17	89
	Blue clay; with lenses of sand	14	103
	Sand and gravel	9	112
	Clay	10	122

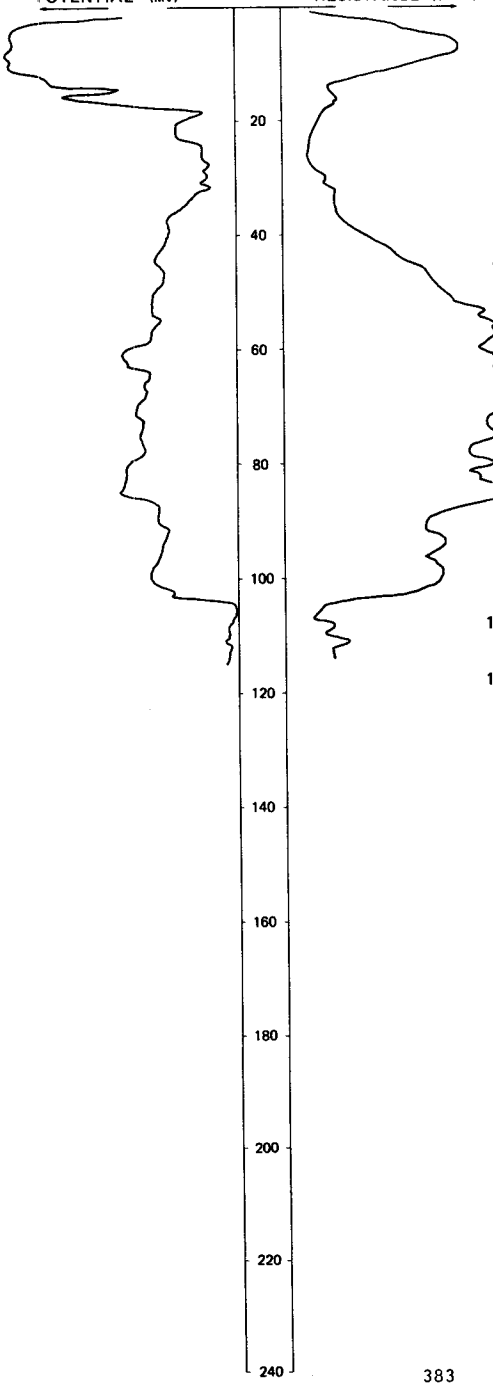
NDSWC 10160

LOCATION: 158-078-36BBB

DATE DRILLED: 7/27/78

ALTITUDE: 1454
(FT, NGVD)

DEPTH: 120
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-7	Clay, yellowish-brown, very silty, oxidized.
7-12	Sand, fine to medium, subrounded, oxidized.
12-44	Clay, dark-gray, silty, cohesive.
44-84	Till, dark-gray, silty, pebbly.
84-87	Sand, fine to medium, subangular to rounded.
87-104	Till, dark-gray, silty, sandy, pebbly.

FOX HILLS SANDSTONE

104-111	Sandstone, light-gray, fine, clayey, poorly indurated.
111-120	Siltstone, brownish-gray, clayey, carbonaceous; interbedded with lenses of dark-gray fine clayey moderately indurated sandstone.

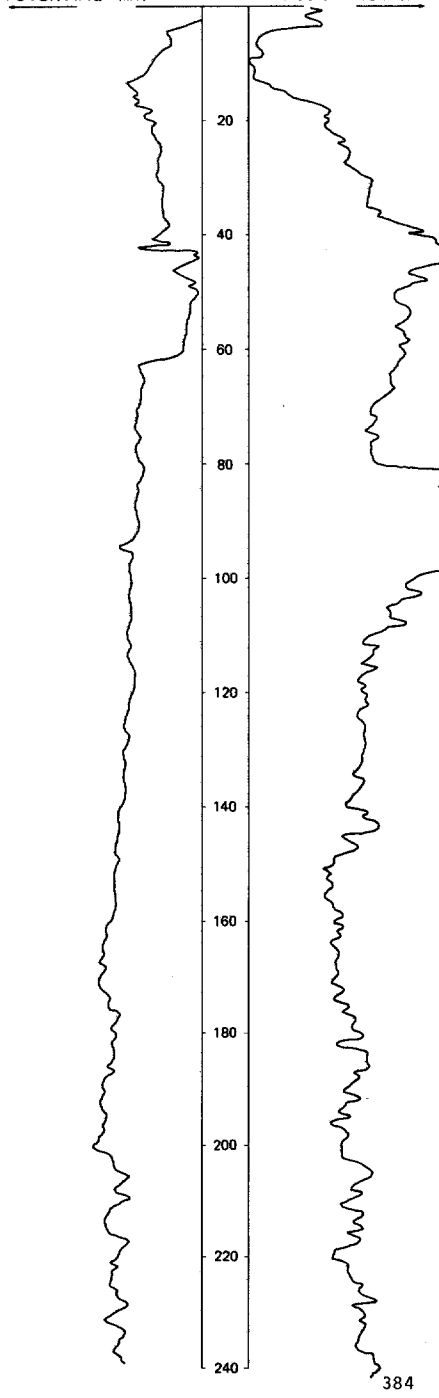
NDSWC 10357

LOCATION: 158-079-09BBB

DATE DRILLED: 10/30/78

ALTITUDE: (FT, NGVD) 1456

DEPTH: (FT) 340



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

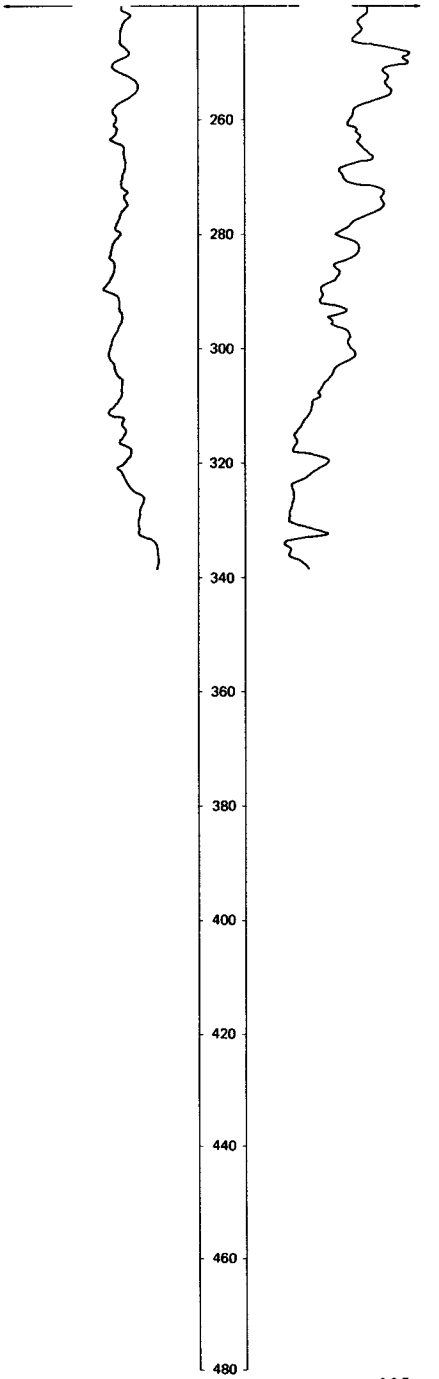
0-1	Topsoil, brownish-black.
1-17	Clay, yellowish-brown, cohesive, oxidized.
17-22	Till, yellowish-brown, oxidized.
22-38	Till, dark-gray, silty, pebbly.
38-44	Sand, fine to medium, gravelly, clayey, subrounded.
44-80	Till, dark-gray, silty, pebbly.
80-100	Till, dark-gray, sandy, gravelly.
100-144	Till, dark-gray, silty, sandy, pebbly.
144-246	Till, dark-gray, silty, sandy, pebbly; detrital lignite.

LOCATION: 158-079-09BBB

DATE DRILLED: 10/30/78

ALTITUDE: (FT, NGVD) 1456

DEPTH: (FT) 340



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

246-286 Till, dark-gray, silty, very sandy, gravelly.

286-324 Till, brownish-gray, silty, very compact; carbonaceous intervals.

FOX HILLS SANDSTONE

324-340 Sandstone, grayish-green, fine, clayey; interbedded with brownish-gray silty carbonaceous moderately indurated shale.

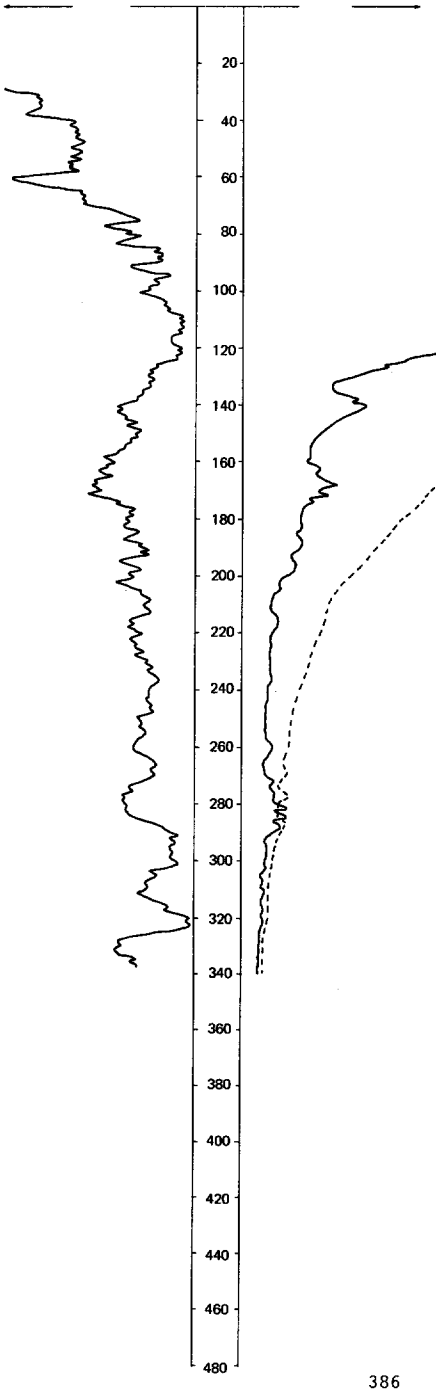
NDSWC 4980

LOCATION: 158-079-13CCC

DATE DRILLED: 9/16/76

ALTITUDE: 1474 (FT, NGVD)

DEPTH: 340 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-31 Sand, very fine to fine, rounded; oxidized to 10 feet.

31-45 Clay, dark-gray, silty, cohesive.

45-124 Till, dark-gray, silty, pebbly; with thin lenses of sandy gravel.

FOX HILLS SANDSTONE

124-162 Siltstone, light-gray to brownish-gray, clayey; interbedded with lenses of dark-gray fine clayey moderately indurated sandstone; carbonaceous intervals.

162-196 Sandstone, greenish-gray, very fine to fine, clayey, glauconitic.

196-260 Siltstone, medium-dark-gray, clayey, micaceous; carbonaceous streaks.

260-285 Shale, dark-gray, bentonitic, sticky.

PIERRE SHALE

285-340 Shale, grayish-black, siliceous, moderately indurated; with thin lenses of bentonite.

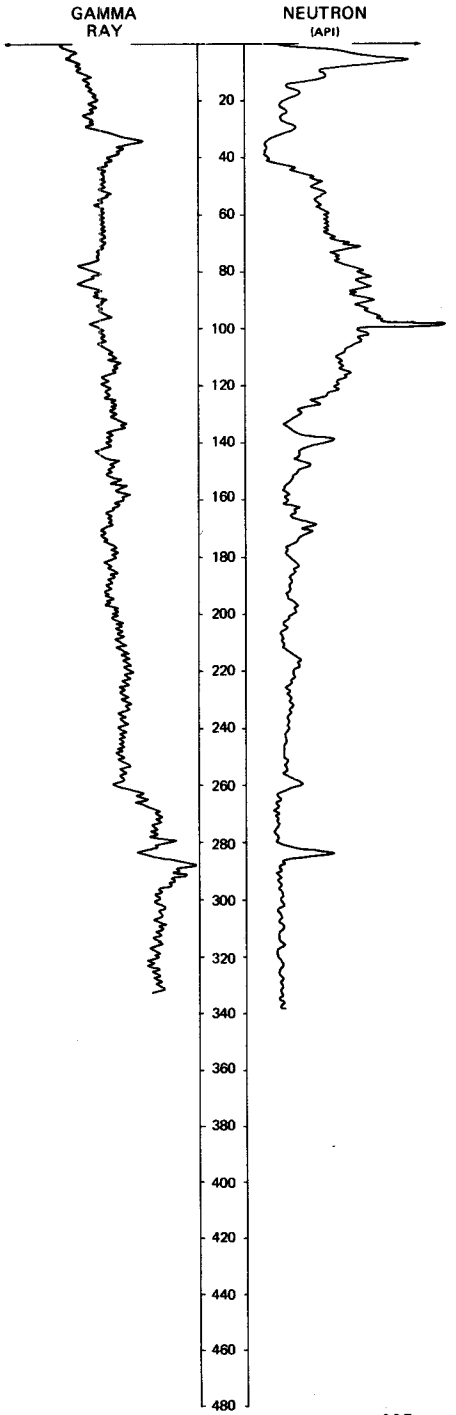
NDSWC 4980, Continued

LOCATION: 158-079-13CCC

DATE DRILLED: 9/16/76

ALTITUDE: 1474
(FT, NGVD)

DEPTH: 340
(FT)



DESCRIPTION OF DEPOSITS

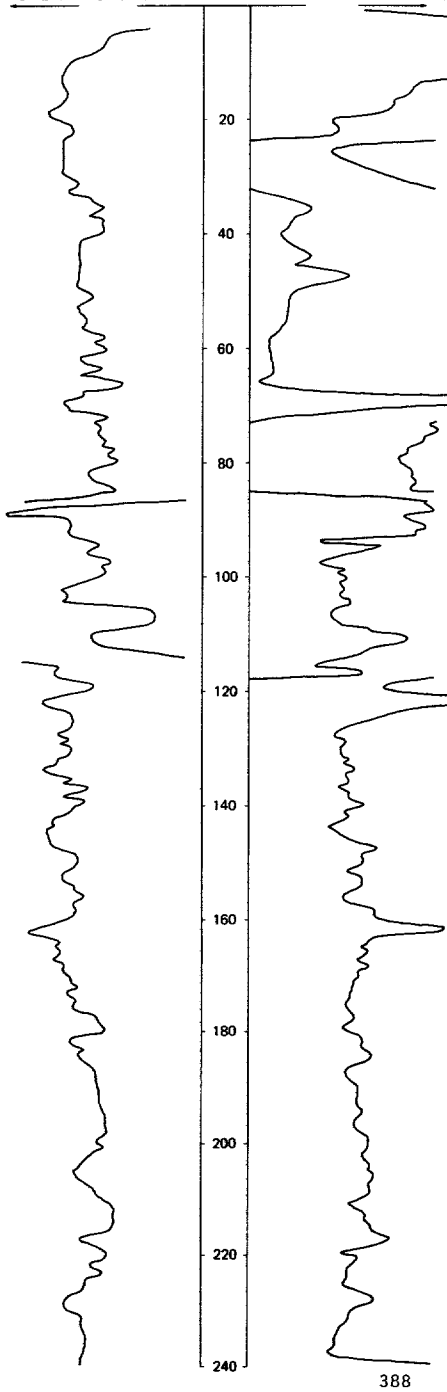
NDSWC 10151

LOCATION: 158-079-16AAA

DATE DRILLED: 7/26/78

ALTITUDE: (FT, NGVD) 1474

DEPTH: (FT) 280



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

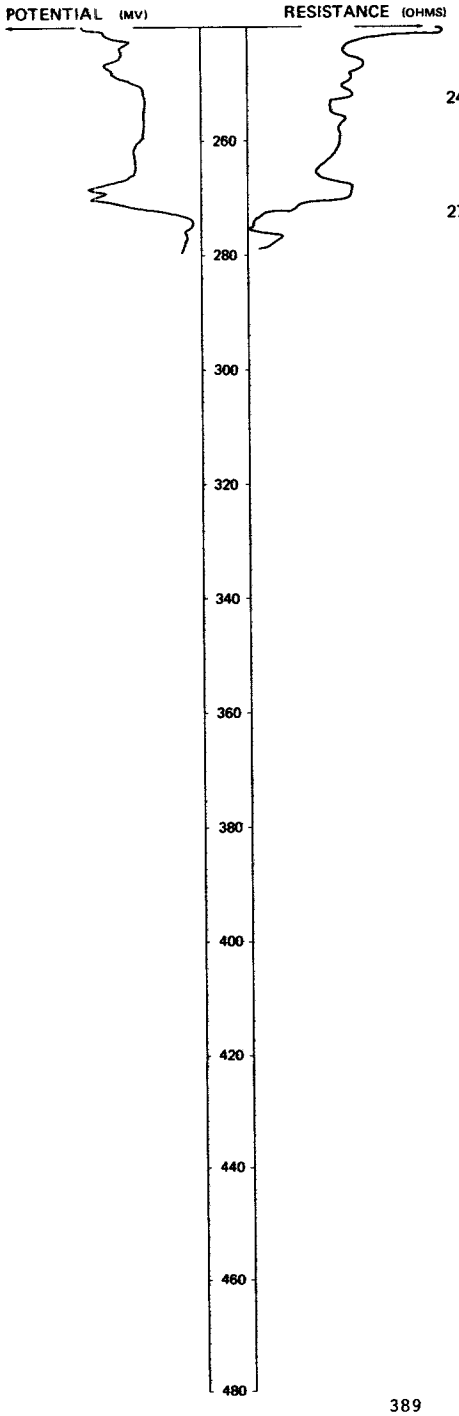
0-19	Sand, very fine to medium; oxidized to 7 feet; about 25 percent silt.
19-24	Clay, olive-gray; about 40 percent silt; detrital lignite.
24-36	Clay, dark-grayish-brown, silty, sandy.
36-68	Till, dark-gray, silty, pebbly.
68-72	Sand, fine to medium, subrounded.
72-86	Till, dark-gray, silty, sandy.
86-93	Sand, medium, gravelly, subrounded to rounded.
93-108	Sand, very fine to coarse; about 20 percent fine gravel; subrounded to rounded.
108-118	Gravel, fine to medium, predominantly fine; about 30 percent medium to coarse sand; subangular to rounded.
118-126	Till, dark-gray; interbedded with lenses of fine gravel.
126-240	Till, dark-gray; interbedded with lenses of clay and occasional lenses of sandy gravel.

LOCATION: 158-079-16AAA

DATE DRILLED: 7/26/78

ALTITUDE: (FT, NGVD) 1474

DEPTH: (FT) 280



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT, Continued

240-271 Clay, dark-grayish-brown, silty; with thin lenses of carbonaceous material.

FOX HILLS SANDSTONE

271-280 Siltstone, dark-grayish-brown, carbonaceous, moderately indurated; with thin lenses of bentonitic clay.

158-079-16CCB
NDSWC 10145

Altitude.	1460 feet	Date drilled:	7/25/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine; about 25 percent silt; oxidized	6	6
	Clay, yellowish-brown, silty, oxidized	8	14
	Till, dark-brown, silty, sandy, oxidized	5	19
	Till, dark-gray, silty, sandy, pebbly	60	79
	Till, dark-gray, silty; with lenses of sandy gravel	21	100
	Till, dark-gray, silty, sandy, pebbly	9	109
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine to fine, clayey; interbedded with dark-brown carbonaceous moderately indurated siltstone	11	120

158-079-18DDD
NDSWC 10146

Altitude:	1466 feet	Date drilled:	7/25/78
Glacial drift:			
	Sand, very fine to fine; about 30 percent silt; rounded; oxidized	4	4
	Clay, yellowish-brown, silty, oxidized	9	13
	Till, yellowish-brown, silty, sandy	3	16
	Till, dark-gray, silty, pebbly; with lenses of sandy gravel	92	108
	Till, dark-gray, gravelly; cobbles	8	116
Fox Hills Sandstone:			
	Siltstone, dark-brown, clayey, carbonaceous; interbedded with grayish-green very fine clayey moderately indurated sandstone	24	140

158-079-21AAA
NDSWC 5873

Altitude:	1474 feet	Date drilled:	10/15/70
Glacial drift:			
	Topsoil, brownish-black, very sandy	1	1
	Sand, very fine, very silty, subangular, oxidized	9	10
	Clay, olive-gray, very silty	23	33
	Till, dark-gray, silty, pebbly; some cobbles	33	66
	Gravel, fine to coarse, very sandy, angular to rounded	20	86
	Till, dark-gray, silty; some cobbles; with thin lenses of sand	16	102
	Sand, very fine to medium, subangular; some detrital lignite	16	118
Fox Hills Sandstone.			
	Sandstone, greenish-gray, very fine to fine; interbedded with thin lenses of siltstone	22	140

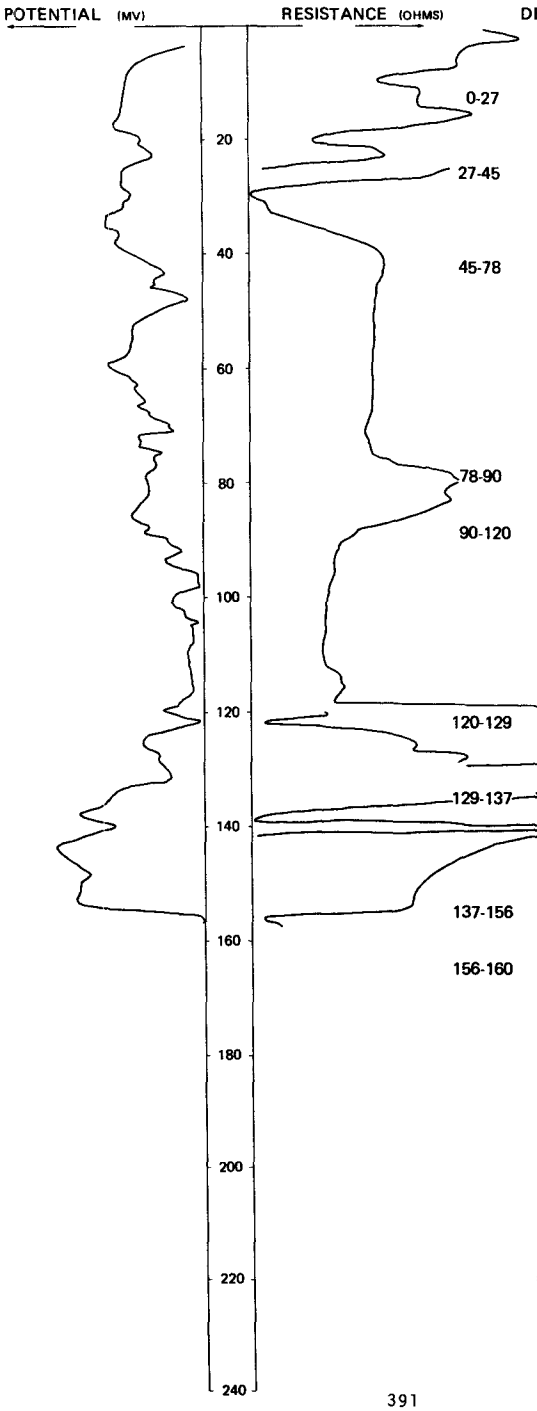
NDSWC 10150

LOCATION: 158-079-22AAA3

DATE DRILLED: 7/26/78

ALTITUDE: (FT, NGVD) 1475

DEPTH: (FT) 160



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-27 Sand, very fine; about 30 percent silt; subrounded to rounded; oxidized to 8 feet.

27-45 Silt, dark-brown, clayey, lignitic.

45-78 Till, dark-gray; about 30 percent silt.

78-90 Till, dark-gray, silty, sandy to gravelly.

90-120 Till, dark-gray, silty, pebbly.

120-129 Sand, medium to coarse; about 20 percent fine gravel; subangular to rounded.

129-137 Gravel, fine to coarse; about 20 percent medium to coarse sand; subangular to rounded.

FOX HILLS SANDSTONE

137-156 Sandstone, light-greenish-gray, very fine to fine, clayey, indurated.

156-160 Siltstone, dark-greenish-gray, clayey, poorly indurated.

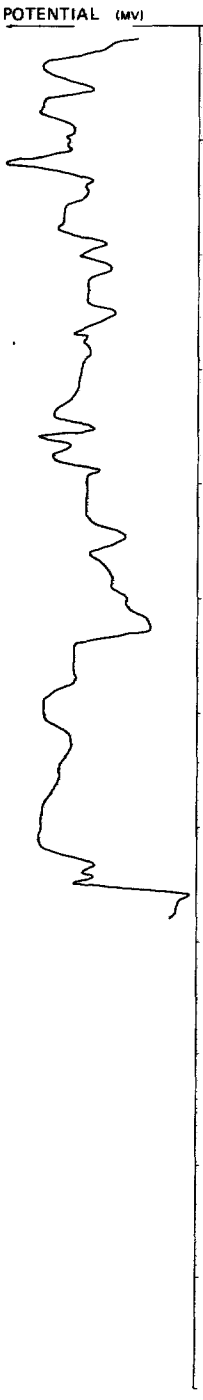
NDSWC 10149

LOCATION: 158-079-23DCC

DATE DRILLED: 7/26/78

ALTITUDE: 1470
(FT, NGVD)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-28 Sand, very fine to fine; about 30 percent silt; subrounded to rounded; oxidized to 14 feet.

28-40 Silt, dark-brownish-gray; about 30 percent clay; carbonaceous.

40-64 Clay, dark-gray, silty.

64-78 Till, dark-gray, sandy, very gravelly.

78-107 Till, dark-gray, silty, pebbly.

107-137 Sand, medium to very coarse, clayey; some lenses of fine gravel.

137-146 Gravel, fine; about 20 percent coarse sand; clayey; subrounded to rounded.

FOX HILLS SANDSTONE

146-160 Sandstone, light-gray, very fine, clayey; interbedded with medium-dark-brown clayey slightly carbonaceous moderately indurated siltstone.

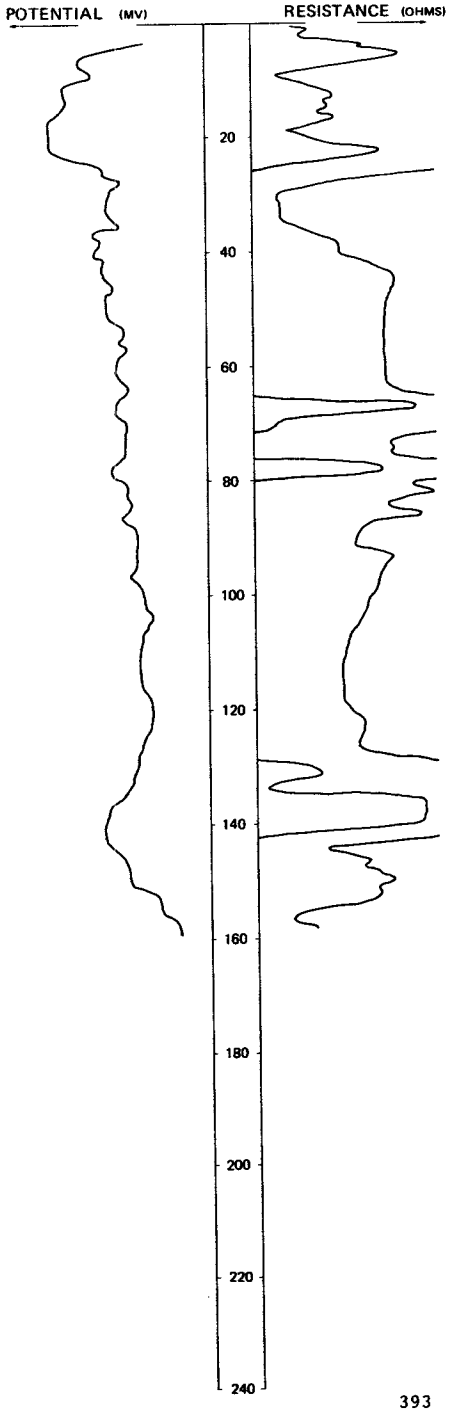
NDSWC 10147

LOCATION: 158-079-23DDD

DATE DRILLED: 7/25/78

ALTITUDE: 1466
(FT, NGVD)

DEPTH: 160
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-8	Clay, yellowish-brown, silty, sandy, oxidized.
8-25	Silt, dark-gray, sandy; detrital lignite.
25-44	Clay, dark-gray, silty, cohesive.
44-65	Till, dark-gray, silty, pebbly.
65-86	Till, dark-gray; with lenses of sand and gravel.
86-129	Till, dark-gray, silty, pebbly.
129-143	Gravel, fine to medium; about 30 percent medium to coarse sand; clayey; subangular to rounded.

FOX HILLS SANDSTONE

143-160	Sandstone, light-gray, very fine, clayey, moderately indurated.

158-079-35AAA
NDSWC 10148

Altitude: 1460 feet — Date drilled: 7/26/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine; about 30 percent silt; subrounded; oxidized to 7 feet	16	16
	Silt, dark-grayish-brown, about 30 percent clay; carbonaceous	18	34
	Clay, dark-gray, silty, sandy	13	47
	Till, dark-gray, silty, sandy, pebbly	35	82
	Till, dark-gray; with lenses of sandy gravel	27	109
Fox Hills Sandstone:			
	Siltstone, dark-brown, clayey, carbonaceous; interbedded with lenses of light-gray very fine poorly indurated sandstone	31	140

158-080-12DDD
NDSWC 10144

Altitude: 1475 feet — Date drilled: 7/25/78

Glacial drift:			
	Topsoil, brownish-black	1	1
	Clay, yellowish-brown, silty, sandy, oxidized	11	12
	Till, grayish-brown, sandy, partially oxidized	18	30
	Till, dark-gray; with thin lenses of sand and gravel	42	72
	Till, dark-gray, silty, pebbly; occasional cobbles	56	128
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine to fine, clayey, poorly indurated	14	142
	Siltstone, dark-brown, clayey, carbonaceous; interbedded with lenses of dark-gray fine moderately indurated sandstone	18	160

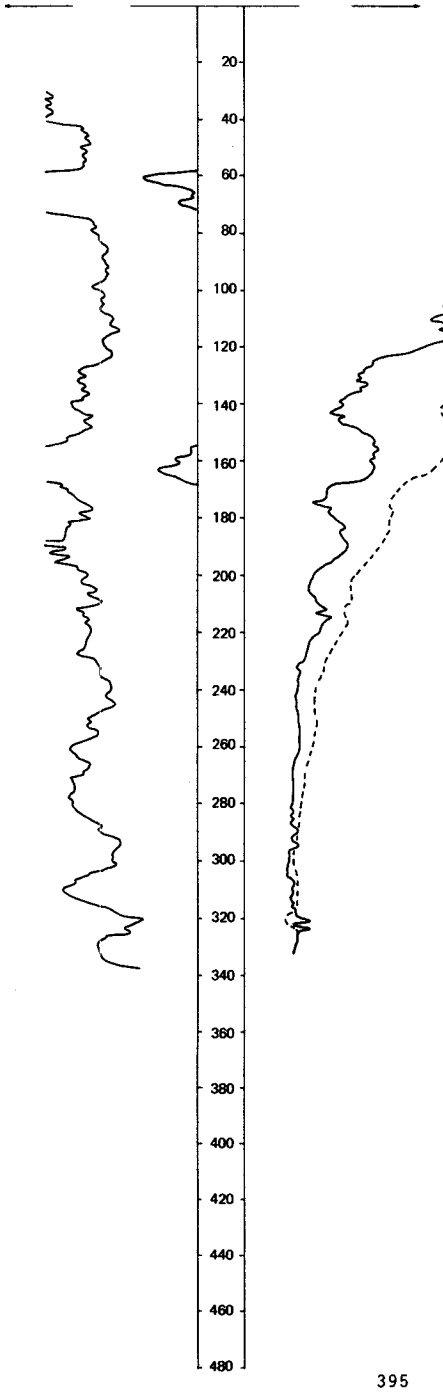
NDSWC 4979

LOCATION: 158-080-13DDD

DATE DRILLED: 9/16/76

ALTITUDE: 1478
(FT, NGVD)

DEPTH: 340
(FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-1	Topsoil, brownish-black.
1-24	Till, yellowish-brown, silty, pebbly, oxidized.
24-66	Till, dark-gray; with thin lenses of sandy gravel.
66-71	Gravel, fine to medium, sandy, subangular to rounded.
71-127	Till, dark-gray, silty, sandy, pebbly.

FOX HILLS SANDSTONE

127-141	Sandstone, greenish-gray, fine to medium, clayey, poorly indurated.
141-149	Shale, grayish-brown, silty, carbonaceous, massive.
149-168	Sandstone, greenish-gray, very fine to fine, clayey, moderately indurated.
168-176	Shale, dusky-brown, carbonaceous; interbedded with grayish-brown clayey bentonitic siltstone.
176-196	Sandstone, light-greenish-gray, very fine to fine, clayey, glauconitic.
196-319	Siltstone, dark-gray, clayey, sandy, bentonitic.

PIERRE SHALE

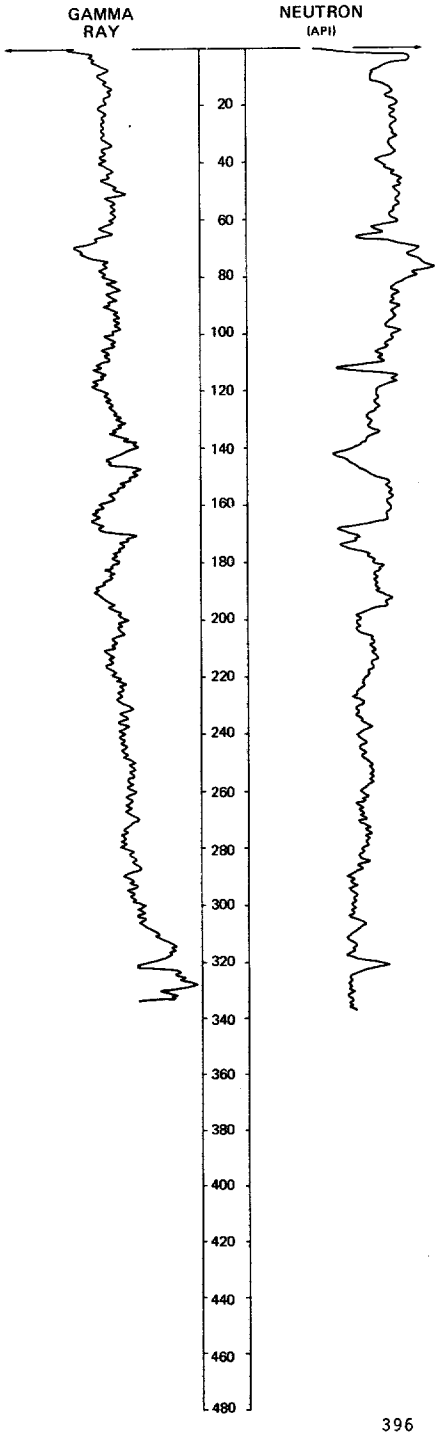
319-340	Shale, black to grayish-black, siliceous, slightly bentonitic, fissile.

LOCATION: 158-080-13DDD

DATE DRILLED: 9/16/76

ALTITUDE: 1478
(FT, NGVD)

DEPTH: 340
(FT)



DESCRIPTION OF DEPOSITS

158-080-22BBB
NDSWC 5871

Altitude:	1489 feet	Date drilled:	10/15/70
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, pebbly; some cobbles	24	25
	Till, olive-gray, silty, pebbly	15	40
	Till, dark-gray, silty; numerous lenses of sandy gravel	20	60
	Till, dark-gray, silty, pebbly	56	116
Fox Hills Sandstone:			
	Siltstone, greenish-gray, sandy; interbedded with brownish-gray carbonaceous moderately indurated shale	24	140

159-076-14BBA
NDSWC 10050

Altitude:	1445 feet	Date drilled:	11/02/77
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, sandy, oxidized	7	8
	Sand, fine to medium, subrounded, oxidized	3	11
	Till, yellowish-brown, silty, pebbly, oxidized	5	16
	Till, dark-gray, silty, sandy	3	19
	Cobbles and boulders	2	21
Fox Hills Sandstone:			
	Sandstone, light-gray, fine, silty, moderately indurated	2	23
	Sandstone, greenish-gray, fine, clayey, moderately indurated	20	43
	Siltstone, grayish-brown, clayey, carbonaceous, moderately indurated	17	60

159-077-05ADD
(Log modified from Kamoni Well Boring)

Altitude:	1465 feet	Date drilled:	8/06/74
	Black dirt	2	2
	Yellow sand; some water from 6 feet on down	18	20
	Lenses of water-bearing blue sand	15	35
	Soapstone	7	42
	Blue clay	6	48

159-077-08AAA
Test hole 635
(Log modified from Paulson and Powell, 1957)

Altitude:	1460 feet	Date drilled:	1/01/52
Glacial drift:			
	Soil, pale-yellowish-brown; almost all sand	2	2
	Sand	2	4
	Silt, grayish-orange	7	11
	Clay, medium-gray, silty	7	18
	Silt, medium-gray, sandy	4	22
	Clay, medium-gray, silty	28	50
	Till, medium-light-gray; varying amounts of sand and gravel	78	128
Fox Hills Sandstone:			
	Clay, light-gray, fine, uniform, noncalcareous	2	130

159-077-08ABB
USBR test hole
(Log modified from Paulson and Powell, 1957)

Altitude: 1460 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Sand, brown, silty	18	19
	Sand, gray, silty	9	28
	Clay, gray	25	53
	Till, gray, sandy and silty	2	55

159-077-08CBB
Test hole 634
(Log modified from Paulson and Powell, 1957)

Altitude: 1435 feet Date drilled: 10/24/52

Alluvium:			
	Soil, very dark brown, sandy	1	1
	Sand, yellow, very fine to fine	4	5
	Sand, light-gray, very fine to fine	12	17
	Sand, pale-yellowish-brown, very fine, and considerable clay	8	25
Glacial drift:			
	Clay, silt, and very fine sand; yellowish brown; poorly sorted	25	50
	Till(?); mostly fine to very coarse sand and considerable clay and silt	15	65
	Till, medium-light-gray	13	78
	Sand, clayey	6	84
	Till, medium-light-gray; varying amounts of sand	42	126
Fox Hills Sandstone:			
	Clay and silt, medium-gray	14	140

159-077-17BAA
NDSWC 10049

Altitude: 1425 feet Date drilled: 11/02/77

Alluvium:			
	Clay, yellowish-brown, silty, oxidized	9	9
	Sand, fine to coarse, silty, subrounded	4	13
	Clay, medium-gray, cohesive	3	16
Glacial drift:			
	Till, dark-gray, silty, sandy, pebbly	51	67
	Sand, fine to medium, silty, subrounded; abundant detrital lignite	2	69
	Till, dark-gray, sandy; abundant detrital lignite	8	77
Fox Hills Sandstone:			
	Siltstone, brownish-gray, clayey, moderately indurated	23	100

159-077-18BBB
Test hole 633
(Log modified from Paulson and Powell, 1957)

Altitude: 1420 feet — Date drilled: 1/01/52

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Alluvium:			
	Soil, dark-brown, peaty	2	2
	Clay, medium-gray	8	10
	Clay, white, highly calcareous	2	12
	Silt, light-olive-gray; with white specks	4	16
	Sand, very fine	6	22
	Sand, medium to coarse	8	30
	Sand and gravel; numerous shale and lignite fragments	7	37
Glacial drift:			
	Till, medium-light-gray to medium-gray; varying amounts of sand and gravel	90	127
Fox Hills Sandstone:			
	Clay and silt; medium-dark-gray; gritty	13	140

159-077-18CDD
NDSWC 10048

Altitude. 1424 feet — Date drilled: 11/02/77

Alluvium.			
	Clay, brownish-black, silty	9	9
	Sand, fine to medium, subrounded; about 50 percent detrital lignite	31	40
Glacial drift:			
	Till, dark-gray, silty, sandy; some cobbles	34	74
	Sand, medium, subangular; abundant detrital lignite	7	81
	Till, dark-gray, sandy; abundant cobbles and boulders	8	89
Fox Hills Sandstone:			
	Siltstone, brownish-gray, clayey, carbonaceous, moderately indurated	11	100

159-077-28CCC
NDSWC 10156

Altitude. 1435 feet — Date drilled: 7/27/78

Glacial drift:			
	Sand, very fine to fine; about 40 percent silt; oxidized	4	4
	Clay, yellowish-brown, silty, sandy, oxidized	15	19
	Sand, very fine to fine, subrounded to rounded, oxidized	7	26
	Clay, olive-gray; about 25 percent silt; cohesive	25	51
	Till, dark-gray, silty, very sandy, pebbly	28	79
Fox Hills Sandstone:			
	Sandstone, light-grayish-green, silty, poorly indurated	5	84
	Siltstone, medium-dark-brown, clayey, partially carbonaceous, well-indurated	16	100

159-078-10BAD2
Test well 69-1
(Log modified from C. A. Simpson & Son)

Altitude:	1440 feet	Date drilled:	9/ /69
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Yellow hard clay	4	5
	Yellow sandy clay	16	21
	Blue clay; with a little seepage at 38 feet	17	38
	Blue sandy clay	17	55
	Hard layer	5	60
	Blue very sandy clay	2	62
	Clayey sand; with some coarse sand	1	63
	Clayey hard sand; with some gravel and pebbles but no water	22	85

159-078-10BAD3
Test hole 69-2
(Log modified from C. A. Simpson & Son)

Altitude:	1440 feet	Date drilled:	9/ /69
	Topsoil	1	1
	Gray sandy clay	6	7
	Brown very sandy clay	27	34
	Gray sandy clay; some sticky	20	54
	Blue very sandy and gravelly clay	3	57
	Gray fine to coarse sand; some very clayey; with some coarse gravel and water	4	61
	Gray fine clayey sand; with some gravel and almost no water	19	80

159-078-14DAD
Test hole 632
(Log modified from Paulson and Powell, 1957)

Altitude:	1417 feet	Date drilled:	1/01/52
Alluvium:			
	Soil, dark-brown, peaty	1	1
	Clay, medium-dark-gray; some vegetation	2	3
	Clay, white, highly calcareous	1	4
	Clay, medium-dark-gray	3	7
	Sand, medium to coarse; numerous well-rounded lignite pebbles up to 1-1/2 inches in diameter	15	22
Glacial drift:			
	Till, medium-gray	80	102
Fox Hills Sandstone:			
	Silt, medium-light-gray	8	110

159-078-21AAA
NDSWC 9567

Altitude:	1455 feet	Date drilled:	5/24/76
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine, well-sorted, oxidized	15	15
	Clay, yellowish-brown, cohesive, oxidized	5	20
	Clay, dark-gray, silty, cohesive	68	88
	Till, dark-gray, silty, sandy, pebbly	19	107
Fox Hills Sandstone:			
	Siltstone, grayish-brown, slightly carbonaceous; interbedded with brown carbonaceous moderately indurated shale	53	160

159-078-21ABA
NDSWC 9565

Altitude:	1445 feet	Date drilled:	5/24/76
Glacial drift:			
	Sand, very fine to fine, well-sorted, oxidized	7	7
	Clay, yellowish-brown, silty, cohesive, oxidized	9	16
	Clay, dark-gray, silty; with occasional lenses of fine sand	66	82
	Till, dark-gray, silty, sandy, pebbly	51	133
	Gravel, fine to medium, sandy, subangular to rounded	13	146
Fox Hills Sandstone:			
	Siltstone, greenish-gray, clayey, sandy, moderately indurated	14	160

159-078-21BAB1
NDSWC 9566

Altitude:	1450 feet	Date drilled:	5/24/76
Glacial drift:			
	Clay, yellowish-brown, silty, cohesive, oxidized	22	22
	Clay, olive-gray, silty, cohesive	42	64
	Sand, medium to coarse, gravelly, subrounded to rounded	22	86
	Till, dark-gray, silty, sandy, pebbly; shove block of sandstone from 101 to 115 feet	31	117
	Gravel, fine to medium, subangular to rounded, fairly well sorted	5	122
	Till, dark-gray, silty, sandy, pebbly	25	147
Fox Hills Sandstone:			
	Shale, medium-brown, carbonaceous, fissile, moderately indurated	8	155
	Sandstone, dark-greenish-gray, very fine to fine, clayey, glauconitic, indurated	5	160

159-078-21BAB2
(Log modified from Farmers Supply Company)

Date drilled: 7/28/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Yellow sandy clay	24	24
	Yellow and gray clay	41	65
	Coarse sand, and fine gravel	25	90

159-078-21DAA
Test hole 625
(Log modified from Paulson and Powell, 1957)

Altitude: 1445 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil and artificial fill	5	5
	Silt, yellowish-gray	12	17
	Silt, medium-light-gray	8	25
	Clay, medium-gray to medium-dark-gray	10	35
	Clay and silt, light-gray	25	60
	Clay, light-olive-gray; becoming very light olive gray near bottom; forms thin flaky chips	30	90
	Clay, very light olive gray	7	97
	Till, medium-light-gray; with a slight yellowish tinge	33	130
Fox Hills Sandstone:			
	Clay, medium-light-gray (drillers report green sandy clay for last 3 feet; not apparent in samples)	10	140

159-078-21DAD
Test hole 619
(Log modified from Paulson and Powell, 1957)

Altitude: 1443 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, very sandy	1	1
	Clay, yellowish-gray, silty	13	14
	Clay, olive-gray, silty	4	18
	Sand, very fine to fine, and light-gray silt	22	40
	Clay, light-gray, silty	40	80
	Clay, light-gray, silty; mixed with yellow clay	10	90
	Clay, light-gray, very silty	36	126
	Till, medium-gray, sandy and gravelly	53	179
Fox Hills Sandstone:			
	Clay, dark-gray, dense, plastic	11	190

159-078-22AAD
Test hole 630
(Log modified from Paulson and Powell, 1957)

Altitude: 1452 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, sandy	1	1
	Silt, yellowish-gray	6	7
	Sand, very fine	3	10
	Silt, yellowish-gray	9	19
	Silt, light-olive-gray	14	33
	Till, medium-light-gray; with considerable very coarse sand from 55 to 65 feet	49	82
Fox Hills Sandstone:			
	Sand, very fine, and very light gray silt	8	90

159-078-22ABB
Test hole 644
(Log modified from Paulson and Powell, 1957)

Altitude: 1458 feet

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, dark-brown, very sandy	3	3
	Silt, yellowish-gray	4	7
	Sand, pale-brown, very fine to fine	16	23
	Clay, medium-light-gray	17	40
	Clay, light-gray	15	55
	Till, medium-light-gray	38	93
	Sand and gravel	1	94
Fox Hills Sandstone:			
	Silt, light-gray, gritty	6	100

159-078-22ACD
Test hole 629
(Log modified from Paulson and Powell, 1957)

Altitude. 1443 feet Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, sandy	1	1
	Silt, yellowish-gray	2	3
	Clay, white, highly calcareous	1	4
	Silt, yellowish-gray	4	8
	Clay, medium-light-gray	20	28
	Till, medium-light-gray	28	56
	Sand and gravel, poorly sorted	9	65
	Granule gravel	5	70
	Granule gravel and very coarse sand	7	77
Fox Hills Sandstone:			
	Siltstone, light-gray	13	90

159-078-22BBC
Test hole 627
(Log modified from Paulson and Powell, 1957)

Altitude: 1445 feet Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown	1	1
	Silt, yellowish-gray	1	2
	Clay, nearly white, highly calcareous	2	4
	Silt, yellowish-gray	12	16
	Silt, medium-light-gray	9	25
	Clay, medium-gray to medium-dark-gray	21	46
	Sand	3	49
	Till, light-gray, sandy	4	53
	Sand and gravel, poorly sorted	8	61
	Till, light-gray	23	84
Fox Hills Sandstone:			
	Clay, light-gray	6	90

159-078-22BCB
NDSWC 9563

Altitude: 1445 feet — Date drilled: 5/21/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellowish-brown, silty, oxidized	15	15
	Clay, olive-gray, silty	33	48
	Sand, fine to medium, gravelly, subangular to rounded	14	62
	Till, dark-gray, silty, sandy, pebbly	30	92
Fox Hills Sandstone:			
	Shale, grayish-brown, carbonaceous, moderately indurated	8	100

159-078-22BCD1
Test hole 623
(Log modified from Paulson and Powell, 1957)

Altitude: 1445 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, sandy	3	3
	Silt, yellowish-gray	14	17
	Silt, light-gray	8	25
	Clay, medium-dark-gray	10	35
	Clay, light-gray to medium-gray	6	41
	Sand, fine	1	42
	Till, light-gray, silty	3	45
	Sand, medium to coarse	5	50
	Sand, coarse to very coarse	5	55
	Gravel, medium	14	69
	Till, light-gray, sandy	20	89
	Gravel	2	91
Fox Hills Sandstone:			
	Clay, light-gray	9	100

159-078-22BCD2
Test hole 626
(Log modified from Paulson and Powell, 1957)

Altitude: 1442 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil and slopewash, dark-brown, clayey	5	5
	Silt, yellowish-gray	7	12
	Silt, medium-light-gray	12	24
	Clay, medium-dark-gray, flaky; with layers of light-gray clay	34	58
	Till, light-gray	4	62
	Sand and gravel; poorly sorted in samples	12	74
	Till, light-gray	3	77
	Sand and gravel	2	79
	Till, light-gray	6	85
Fox Hills Sandstone:			
	Silt and very fine sand; light gray	5	90

159-078-22CAC
Test hole 620
(Log modified from Paulson and Powell, 1957)

Altitude:	1452 feet	Date drilled:	1/01/52
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, dark-brown	1	1
	Silt, yellowish-gray	13	14
	Clay, grayish-black, plastic	2	16
	Clay, medium-gray	8	24
	Silt and sand; with lesser amounts of gravel; may be till; small snail shell found in sample from 30 to 35 feet	10	34
	Silt, medium-light-gray	21	55
	Sand, very coarse, and medium gravel	5	60
	Silt, very fine sand, and small amount of gravel	5	65
	Sand, fine	5	70
	Sand, very fine to fine, and gravel; small amount of black plastic clay	5	75
	Sand, very fine to medium; possibly some clay	5	80
	Gravel, medium, fine sand, and clay	5	85
	Gravel, medium, and fine sand; less clay than from 80 to 85 feet	5	90
Fox Hills Sandstone:			
	Silt and very fine sand; light gray	47	137
	Sand, pale-yellowish-brown; much clay and silt	5	142
	Silt and very fine sand; light gray	8	150
	Silt and very fine sand; grayish green	5	155
	Clay, medium-gray; poor samples	25	180

159-078-22CAD
Test hole 621
(Log modified from Paulson and Powell, 1957)

Altitude:	1448 feet	Date drilled:	1/01/52
Glacial drift:			
	Soil, dark-brown, sandy	2	2
	Silt, grayish-yellow	17	19
	Clay, medium-gray, silty	23	42
	Till, light-gray, sandy	26	68
	Sand, medium to coarse, clayey	2	70
	Sand, medium to coarse	10	80
	Gravel and sand	6	86
	Till, light-gray, sandy	5	91
Fox Hills Sandstone:			
	Clay and silt, light-gray	9	100

159-078-22CBA1
Test hole 628
(Log modified from Paulson and Powell, 1957)

Altitude: 1442 feet — Date drilled: 1/01/52

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, dark-brown, sandy	1	1
	Silt, yellowish-gray	13	14
	Clay, medium-light-gray, silty	36	50
	Clay, medium-light-gray, silty; intermixed with considerable yellow clay	5	55
	Clay, medium-light-gray	14	69
	Till, medium-light-gray	13	82
	Sand, gravel, and clay; yellowish gray	7	89
	Till, medium-light-gray	4	93
Fox Hills Sandstone:			
	Siltstone, greenish-gray	7	100

159-078-22CBA2
(Log modified from Paulson and Powell, 1957)

Altitude: 1449 feet — Date drilled: 9/08/49

	Clay	15	15
	Sand and clay	10	25
	Sand (water)	1	26
	Clay; boulder at 30 feet	14	40
	Sand and clay	20	60
	Gravel (water)	2	62
	Clay	1	63

159-078-22CBC1
(Log modified from Paulson and Powell, 1957)

Altitude: 1450 feet — Date drilled: 1/01/49

	Sand and clay	17	17
	Quicksand	3	20
	Clay, blue	105	125
	Sand and clay	27	152
	Sand and gravel	6	158

159-078-22CBC2
(Log modified from Paulson and Powell, 1957)

Altitude: 1450 feet — Date drilled: 1/01/49

	Sand and reddish sand	30	30
	Quicksand	5	35
	Clay	135	170
	Sand and clay	10	180
	Sand; a little water	2	182
	Clay, blue	288	470
Pierre Shale:			
	Clay, black, or very hard shale	5	475

159-078-22CBC3
Test hole 614
(Log modified from Paulson and Powell, 1957)

Altitude: 1450 feet — Date drilled: 1/01/52

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, moderate-yellowish-brown, very sandy	1	1
	Sand, yellowish-gray, very fine to fine	12	13
	Silt, yellowish-gray	4	17
	Clay and silt, medium-gray	17	34
	Sand, very fine, and silt; light olive gray	11	45
	Silt, gray, and very coarse sand	20	65
	Sand, very fine, much silt	10	75
	Clay, silt, and very fine sand	27	102
	Till(?), medium-gray; contains very small amounts of sand and gravel	33	135
Fox Hills Sandstone:			
	Silt, light-gray, sandy	15	150

159-078-22CBC4
Test hole 615
(Log modified from Paulson and Powell, 1957)

Altitude: 1450 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, very sandy	1	1
	Silt and very fine sand; dark yellowish brown	11	12
	Silt, yellowish-gray	4	16
	Clay, medium-gray	20	36
	Silt and very fine sand; light gray	14	50
	Clay and silt, medium-gray	10	60
	Silt and very fine sand	10	70
	Clay and silt, medium-gray	15	85
	Clay, medium-gray to medium-dark-gray; appears in samples as angular curled chips	33	118
	Till, light-gray, sandy; becoming gravelly and very light gray near bottom	54	172
Fox Hills Sandstone:			
	Clay, pale-green	8	180

159-078-22CBC5
Test hole 616
(Log modified from Paulson and Powell, 1957)

Altitude: 1450 feet — Date drilled: 1/01/52

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, dark-brown, very sandy	1	1
	Silt, yellowish-brown	17	18
	Clay, light-gray, silty	14	32
	Silt and very fine sand; olive gray	8	40
	Clay and silt	5	45
	Silt and very fine sand	5	50
	Clay, light-olive-gray; appears as angular curling chips	10	60
	Clay, light-olive-gray; overall lighter color than from 50 to 60 feet; samples seem to be composed of streaked gray and yellowish-gray clay; definite appearance of laminations, the dark layers being clay and the light layers being silt and very fine sand	68	128
	Till(?), light-gray, sandy; contains very few pebbles	55	183
Fox Hills Sandstone:			
	Clay or shale, medium-dark-gray	7	190

159-078-22CBD1
Test hole 618
(Log modified from Paulson and Powell, 1957)

Altitude: 1445 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, sandy	1	1
	Silt, yellow	8	9
	Clay, medium-gray, silty	52	61
	Sand and clay	20	81
Fox Hills Sandstone:			
	Siltstone, medium-gray	9	90

159-078-22CBD2
Test hole 617
(Log modified from Paulson and Powell, 1957)

Altitude: 1443 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, sandy	1	1
	Silt, yellow	14	15
	Clay, medium-gray	25	40
	Silt, light-gray	10	50
	Clay and silt, medium-gray to medium-dark-gray, probably laminated	15	65
	Silt, yellowish-gray	7	72
	Till, light-gray, sandy	12	84
Fox Hills Sandstone:			
	Silt, grayish-green	1	85
	Clay, light-gray	5	90

159-078-22CBD3
Test hole 613
(Log modified from Paulson and Powell, 1957)

Altitude:	1443 feet	Date drilled:	1/01/52
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, dark-brown, sandy	2	2
	Silt, yellowish-gray	12	14
	Clay, medium-gray	12	26
	Sand, very fine to fine	15	41
	Silt and very fine sand; olive gray	62	103
Fox Hills Sandstone:			
	Clay or shale, light-gray	17	120

159-078-22CBD4
Test hole 612
(Log modified from Paulson and Powell, 1957)

Altitude:	1445 feet	Date drilled:	1/01/52
Glacial drift:			
	Soil, dark-brown, very sandy	2	2
	Clay, highly calcareous; very light gray with white specks of calcium carbonate	2	4
	Clay, light-yellowish-gray, silty	7	11
	Sand, very fine to fine	29	40
	Silt, medium-light-gray	20	60
	Clay and silt, medium-gray	17	77
	Till, light-gray	6	83
	Sand, clayey	7	90
	Till, light-gray	8	98
	Sand, clayey	2	100
	Till, light-gray	4	104
Fox Hills Sandstone:			
	Clay, light-gray, silty	49	153
	Sand, very fine, or siltstone; grayish green	7	160
	Clay, medium-light-gray	5	165
	Shale, medium-gray to medium-dark-gray; appears as chips in samples; not as silty or sandy as overlying materials; contains fragments of nearly white very fine grained clay that readily disperses when wet (probably bentonite)	45	210

159-078-22CCB
NDSWC 9564

Altitude: 1442 feet — Date drilled: 5/21/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine, silty, oxidized	8	8
	Clay, dark-brownish-gray, cohesive, partially oxidized	36	44
	Sand, very fine to fine, silty, subrounded to rounded	13	57
	Clay, dark-brownish-gray, slightly carbonaceous, cohesive	88	145
	Till, olive-gray, silty, sandy, pebbly	5	150
	Sand, fine; about 30 percent very fine to medium gravel; silty; subangular to rounded	6	156
Fox Hills Sandstone:			
	Siltstone, brownish-gray, clayey, partially carbonaceous	31	187
	Sandstone, greenish-gray, very fine, clayey, moderately indurated	2	189
	Shale, brownish-gray, fissile; interbedded with olive-black bentonitic indurated siltstone; poor cutting return	171	360

159-078-22CDA
Test hole 622
(Log modified from Paulson and Powell, 1957)

Altitude: 1445 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, sandy	3	3
	Silt, grayish-yellow	12	15
	Clay, light-olive-gray, silty	10	25
	Clay, medium-gray to dark-olive-gray; may be laminated inasmuch as the cuttings are composed mostly of thin curly chips or flakes	22	47
	Sand, medium to coarse; samples contain considerable amounts of clay not reported by drillers	11	58
	Till, light-gray, sandy, gravelly	34	92
Fox Hills Sandstone:			
	Clay, medium-light-gray	8	100

159-078-22CDB1
Test hole 624
(Log modified from Paulson and Powell, 1957)

Altitude: 1445 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, sandy	3	3
	Silt and very fine sand; yellowish-gray	5	8
	Clay, white, highly calcareous	2	10
	Sand, yellowish-gray, very fine	5	15
	Sand, light-gray, fine; many lignite fragments	15	30
	Sand, light-gray, very fine to fine	6	36
	Silt and very fine sand; light gray	4	40
	Clay, light-olive-gray	27	67
	Till, light-gray, sandy	10	77
	Sand and gravel	1	78
	Till, light-gray	7	85
	Sand, medium to coarse, clayey	11	96
	Till, light-gray	17	113
Fox Hills Sandstone:			
	Clay, light-gray, silty	7	120

159-078-22CDB2
(Log modified from Paulson and Powell, 1957)

Altitude: 1445 feet — Date drilled: 8/31/49

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand and clay	15	15
	Sand, very fine	3	18
	Clay, blue	42	60
	Sand and clay	18	78

159-078-22DBB
Test hole 642
(Log modified from Paulson and Powell, 1957)

Altitude: 1440 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, sandy	1	1
	Silt, yellowish-gray	9	10
	Silt, light-olive-gray	7	17
	Clay, medium-light-gray, silty	20	37
	Till, medium-light-gray	5	42
	Sand, clayey	8	50
	Sand, very coarse, and medium gravel; clean	6	56
	Till, medium-light-gray	28	84
Fox Hills Sandstone:			
	Silt, light-gray	6	90

159-078-23BAA
Test hole 631
(Log modified from Paulson and Powell, 1957)

Altitude: 1425 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-gray	1	1
	Clay and silt, yellowish-gray	13	14
	Clay and silt, light-olive-gray	9	23
	Till, medium-gray	29	52
Fox Hills Sandstone:			
	Sand, very fine, and silt; very light gray	6	58
	Silt, medium-gray	2	60

159-078-23CBC
Test hole 643
(Log modified from Paulson and Powell, 1957)

Altitude: 1450 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, very sandy	1	1
	Sand, yellow, very fine to fine	16	17
	Silt, light-olive-gray	7	24
	Clay, light-gray	13	37
	Till, light-olive-gray, sandy	24	61
	Sand	1	62
	Till, light-olive-gray, sandy, hard	25	87
Fox Hills Sandstone:			
	Silt, light-gray	8	95

159-078-26BDC
Test hole 636
(Log modified from Paulson and Powell, 1957)

Altitude:	1450 feet	Date drilled:	1/01/52
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, dark-grayish-brown	2	2
	Silt, yellowish-gray	1	3
	Clay, very light gray, nearly white, highly calcareous	2	5
	Silt and very fine sand; pale yellowish brown	10	15
	Clay and silt, yellowish-gray	5	20
	Silt and very fine sand; yellowish gray	5	25
	Clay, light-olive-gray to olive-gray; appears as flaky chips in samples	16	41
	Clay, silt, and sand	4	45
	Till, medium-light-gray	24	69
	Sand and gravel, poorly sorted	7	76
	Till, medium-light-gray	12	88
Fox Hills Sandstone:			
	Silt, light-gray	12	100

159-078-26CBB
NDSWC 10047

Altitude:	1445 feet	Date drilled:	11/02/77
Glacial drift:			
	Topsoil, brownish-black, sandy	1	1
	Sand, very fine to fine, silty, subrounded, oxidized	2	3
	Clay, yellowish-brown, silty, oxidized	15	18
	Clay, medium-gray, silty	18	36
	Till, dark-gray, silty, sandy, pebbly	8	44
	Sand, fine to medium, well-rounded; predominantly quartz	3	47
	Till, dark-gray, silty, sandy, pebbly	12	59
	Sand, medium to coarse, predominantly medium, rounded	13	72
	Till, dark-gray, silty; with thin lenses of medium sand	17	89
Fox Hills Sandstone:			
	Siltstone, brownish-gray, clayey, slightly carbonaceous, moderately indurated	11	100

159-078-28AAD
Test hole 638
(Log modified from Paulson and Powell, 1957)

Altitude: 1447 feet — Date drilled: 1/01/52

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil and slopewash, dark-brown	1	1
	Silt, yellowish-gray	19	20
	Clay, greenish-gray	20	40
	Clay, medium-gray; flaky chips	10	50
	Clay, medium-light-gray, flaky; becoming lighter towards bottom	13	63
	Till, medium-light-gray	6	69
	Sand, medium to very coarse	6	75
	Sand, medium to very coarse, and gravel	5	80
	Sand, very fine to very coarse, poorly sorted	5	85
	Sand, very coarse	5	90
	Clay, yellow and gray	5	95
	Clay and gravel; numerous yellow clay pebbles	2	97
Fox Hills Sandstone:			
	Silt, medium-light-gray	13	110

159-078-28ADA
Test hole 639
(Log modified from Paulson and Powell, 1957)

Altitude: 1428 feet — Date drilled: 1/01/52

Alluvium and slopewash:			
	Soil, dark-brown, clayey	1	1
	Silt, medium-gray, sandy, and much calcareous material	9	10
	Silt and very fine sand; medium dark gray	5	15
Glacial drift:			
	Clay and silt; varying shades of gray	20	35
	Till, medium-light-gray	36	71
Fox Hills Sandstone:			
	Silt, very light gray	9	80

159-078-28ADD
Test hole 640
(Log modified from Paulson and Powell, 1957)

Altitude: 1428 feet — Date drilled: 1/01/52

Alluvium and slopewash:			
	Soil, dark-brown, clayey	1	1
	Silt, light-gray	2	3
Glacial drift:			
	Silt, yellowish-gray	5	8
	Sand, very fine to fine	5	13
	Clay, medium-light-gray, silty	14	27
	Till, medium-light-gray	3	30
	Sand and gravel; possibly becoming coarser toward bottom	13	43
	Till, medium-light-gray	17	60

159-078-28BBB
Test hole 641
(Log modified from Paulson and Powell, 1957)

Altitude: 1436 feet — Date drilled: 1/01/52

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Soil, dark-brown, clayey	1	1
	Clay, yellowish-gray	16	17
	Clay, medium-light-gray	4	21
	Till, medium-light-gray	8	29
	Sand, medium to coarse, and small amount of gravel	7	36
	Till, medium-light-gray, sandy	46	82
Fox Hills Sandstone:			
	Clay, light-gray, silty	8	90

159-078-28CC
(Log from Farmers Supply Company)

Date drilled: 8/26/76

	Topsoil sand	7	7
	Coal	2	9
	Yellow sandy clay	18	27
	Gray clay till	17	44
	Sand and gravel	2	46
	Gray clay till	34	80

159-078-34CBB
(Log modified from Paulson and Powell, 1957)

Altitude: 1445 feet — Date drilled: 9/02/49

	Loam, black, sandy	2	2
	Clay, yellow, sandy	20	22
	Clay, blue	33	55

159-078-35AAA
Test hole 637
(Log modified from Paulson and Powell, 1957)

Altitude: 1448 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, very sandy	2	2
	Sand, yellowish-brown, very fine to fine	13	15
	Silt and very fine sand; yellowish gray	10	25
	Silt, light-olive-gray, sandy	10	35
	Silt, light-olive-gray	10	45
	Clay, light-gray, fine, uniform	17	62
	Clay, sandy, and gravel	4	66
	Till, medium-light-gray	3	69
	Sand and gravel, poorly sorted	7	76
	Till, medium-light-gray	12	88
	Silt, very light gray to light-gray	12	100

159-079-02CBB
(Log modified from Paulson and Powell, 1957)

Altitude: 1449 feet — Date drilled: 1/01/49

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Loam, sandy	1	1
	Sand, red, and clay	9	10
	Quicksand	5	15
	Sand and blue clay	25	40
	Clay, blue	30	70
	Clay, blue, and sand	20	90
	Gravel and blue clay; a little water	10	100
	Clay, blue	50	150

159-079-02DCC
(Log modified from Paulson and Powell, 1957)

Altitude: 1448 feet — Date drilled: 1/01/09

	Sand and loam	10	10
	Clay, blue	40	50
	Gravel	26	76

159-079-03ADA
(Log modified from Paulson and Powell, 1957)

Altitude: 1451 feet — Date drilled: 1/01/49

	Sand and loam	10	10
	Quicksand	5	15
	Clay, blue	75	90
	Sand, fine	26	116
	Gravel	4	120

159-079-08BAD
(Log from Nick Erck Well Drilling)

Date drilled: 8/19/74

	Sand	11	11
	Gray clay	53	64
	Gravel; water	----	64

159-079-24DDD
Test hole 645
(Log modified from Paulson and Powell, 1957)

Altitude: 1442 feet — Date drilled: 1/01/52

Glacial drift:			
	Soil, dark-brown, clayey	1	1
	Clay, yellowish-gray	7	8
	Clay, light-olive-gray, silty	15	23
	Till, yellowish-gray	17	40
	Till, light-olive-gray	15	55
	Till, light-gray, very sandy	22	77
Fox Hills Sandstone:			
	Sand, grayish-green, fine to medium, clayey and silty	23	100

159-079-26ABB
(Log modified from Paulson and Powell, 1957)

Altitude:	1454 feet	Date drilled:	1/01/08
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	No description	14	14
	Quicksand	2	16
	Clay, blue	38	54

159-079-26BBB
Test hole 646
(Log modified from Paulson and Powell, 1957)

Altitude:	1446 feet	Date drilled:	1/01/52
Glacial drift:			
	Soil, dark-brown, sandy	1	1
	Sand, pale-brown	4	5
	Silt, yellowish-brown	12	17
	Clay, medium-light-gray	6	23
	Till, medium-light-gray	34	57
	Sand	1	58
	Till, medium-light-gray	3	61
	Sand and gravel	7	68
	Till, medium-light-gray	20	88
Fox Hills Sandstone:			
	Sand, light-grayish-green, fine to medium; about 50 percent clay and silt	12	100

159-079-28CCA
(Log from Farmers Supply Company)

Altitude:	1470 feet	Date drilled:	8/22/76
	Topsand	7	7
	Yellow sandy clay	24	31
	Gray clay till	57	88
	Gray clay; with small gravel layers	3	91
Fox Hills Sandstone:			
	Gray hard clay	11	102
	Gray clay; with sand layers	16	118
	Gray fine sand; some clay layers; some sandstone	22	140

159-079-28CCB
(Log modified from Farmers Supply Company)

Date drilled: 8/24/76

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Sand	14	14
	Yellow sandy clay	22	36
	Gray clay till; with some gravel layers	66	102
Fox Hills Sandstone:			
	Gray hard clay; some small gray sand layers	38	140
	Very hard dark clay	460	600

159-079-28CCC
(Log modified from Farmers Supply Company)

Date drilled: 8/24/76

	Sand	13	13
	Yellow sandy clay	15	28
	Gray clay till	31	59
	Rock	1	60
	Gray clay till	8	68
	Gray clay; with small gravel layers	23	91
Fox Hills Sandstone:			
	Gray very hard clay	21	112
	Gray clay	28	140
	Gray sand; with some clay layers and some sandstone	30	170

159-079-28CDA
(Log modified from Farmers Supply Company)

Date drilled: 8/24/76

	Sand	20	20
	Gray clay	12	32
	Gray clay till	39	71
	Gray clay; with some sand layers	31	102
	Sand layers with clay layers	10	112
	Very hard clay	30	142
	Gray sandy very tight clay	28	170
	Gray hard clay	10	180

159-079-29CDC
(Log modified from Farmers Supply Company)

Date drilled: 8/25/76

	Sand	11	11
	Yellow sandy clay	15	26
	Gray clay till	60	86
	Gray very hard clay	22	108
	Gray clay	50	158
	Gray clay, with small layers of sand	22	180

159-079-32DDD
NDSWC 10152

Altitude.	1450 feet	Date drilled:	7/26/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Clay, yellowish-brown, cohesive, oxidized	14	14
	Till, yellowish-brown, silty, sandy, pebbly, oxidized	19	33
	Till, dark-gray, silty	8	41
	Gravel, fine to medium; about 30 percent coarse to very coarse sand; subrounded to rounded; mostly carbonates	3	44
	Till, dark-gray; interbedded with lenses of coarse sand and fine gravel	14	58
	Till, dark-gray, silty, sandy, pebbly	43	101
	Till, dark-gray; interbedded with lenses of fine to coarse sand; gravelly; subrounded	7	108
	Till, dark-gray, silty, sandy	8	116
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine, clayey, poorly indurated	10	126
	Siltstone, dark-brown, clayey, carbonaceous, moderately indurated	14	140

159-079-36ABB
(Log modified from Paulson and Powell, 1957)

Altitude:	1454 feet	Date drilled:	1/01/49
	Sand	27	27
	Clay and gravel	25	52

159-080-02BCB
(Log modified from Neff Drilling Company)

		Date drilled:	5/12/72
	Blown sand	12	12
	Yellow clay	8	20
	Yellow sandy clay	20	40
	Blue sandy clay	78	118
	Very fine sand	8	126
	Blue sandy clay	13	139
	Very fine sand	7	146

159-080-15DDD
(Log from Stemen Drilling Co.)

Date drilled: 12/19/74

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
	Topsoil	1	1
	Brown sandy clay	14	15
	Brown clay	17	32
	Gray sandy clay	13	45
	Gray clay and gravel	22	67
	Sand and gravel	2	69
	Gray clay and sand	27	96
	Gray clay	2	98
	Sand and gravel	3	101

159-080-23AAA
NDSWC 5872

Altitude: 1470 feet

Date drilled: 10/15/70

Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, dusky-yellowish-brown, silty, pebbly, oxidized; some cobbles	21	22
	Till, olive-gray, silty, pebbly	20	42
	Sand, very fine to fine, subangular to rounded, well-sorted	4	46
	Till, dark-gray, silty; occasional thin lenses of sand and gravel	45	91
	Sand, very fine to coarse, gravelly, subangular to rounded	9	100
	Till, dark-gray, silty, pebbly; occasional thin lenses of sand	37	137
	Sand, greenish-gray, very fine to fine, clayey, reworked locally derived Fox Hills Sandstone	5	142
Fox Hills Sandstone:			
	Sandstone, greenish-gray, very fine to fine, silty, moderately indurated	18	160

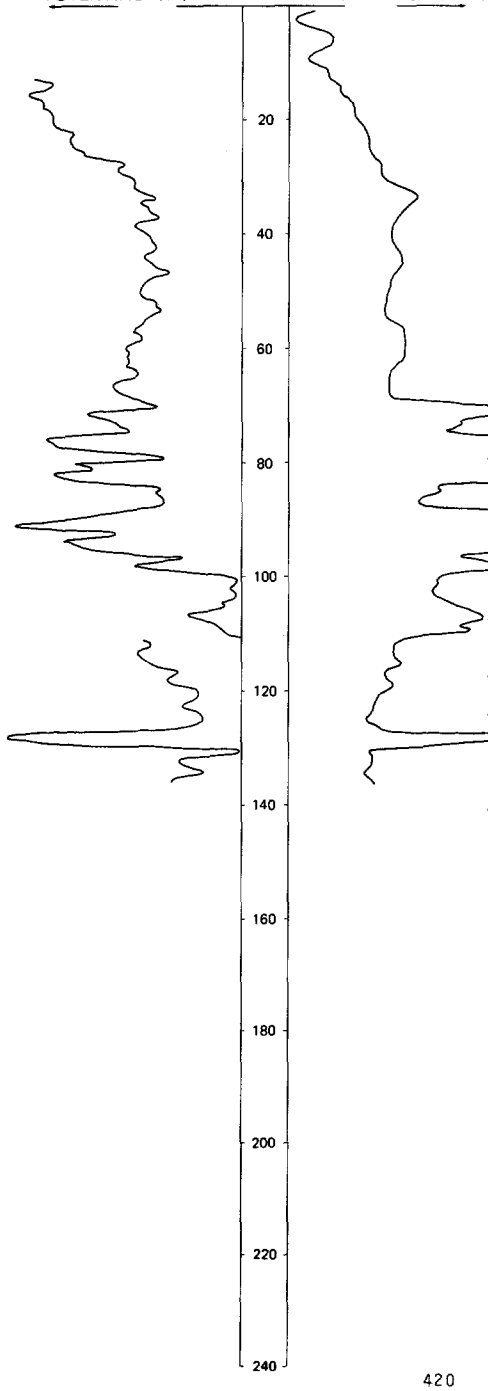
NDSWC 10142

LOCATION: 159-080-26BBB

DATE DRILLED: 7/24/78

ALTITUDE: 1478 (FT, NGVD)

DEPTH: 140 (FT)



DESCRIPTION OF DEPOSITS

GLACIAL DRIFT

0-31	Till, yellowish-brown, silty, pebbly, oxidized.
31-71	Till, dark-gray, silty, sandy, pebbly.
71-84	Gravel, fine to medium; about 30 percent medium to very coarse sand; subrounded to rounded; mostly carbonates.
84-90	Till, dark-gray, silty, sandy, pebbly.
90-99	Till, dark-gray; with lenses of sand and gravel.
99-106	Till, dark-gray, sandy, pebbly.
106-110	Sand, fine to medium, gravelly, subrounded.
110-126	Till, dark-gray, sandy, pebbly.
126-128	Gravel, fine to medium, sandy, subrounded to rounded.

FOX HILLS SANDSTONE

128-140	Sandstone, light-gray, very fine, clayey; interbedded with medium-brown clayey carbonaceous poorly indurated siltstone.

159-080-28DDD
NDSWC 10141

Altitude: 1430 feet — Date drilled: 7/24/78

GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to fine; about 30 percent silt; subrounded to rounded; oxidized	6	6
	Till, yellowish-brown, silty, sandy, pebbly, oxidized	18	24
	Till, dark-gray; lenses of sand at 51, 68, and 78 feet	71	95
	Gravel, fine; about 30 percent fine to coarse sand; subrounded to rounded	5	100
	Till, dark-gray, silty, interbedded with thin lenses of sandy gravel	43	143
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine, clayey; interbedded with dark-brown clayey carbonaceous poorly indurated siltstone	17	160

159-080-34CCC
NDSWC 10140

Altitude: 1482 feet — Date drilled: 7/24/78

Glacial drift:			
	Sand, very fine to fine, silty, subrounded, oxidized	5	5
	Clay, yellowish-brown, silty, sandy, oxidized	4	9
	Till, yellowish-brown, silty, sandy, pebbly, oxidized	20	29
	Till, dark-gray, silty, sandy to very sandy	32	61
	Sand, very fine to very coarse, about 20 percent fine gravel, subrounded to rounded; mostly detrital shale	3	64
	Till, dark-gray, silty, sandy, pebbly	8	72
	Gravel, fine, sandy, subrounded	1	73
	Till, dark-gray, silty, sandy, pebbly, occasional cobbles	63	136
	Gravel, fine to medium, sandy, subangular to rounded	1	137
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine to fine, clayey; interbedded with medium-dark-brown clayey carbonaceous moderately indurated siltstone	23	160

159-080-35DDD
NDSWC 10143

Altitude:	1475 feet	Date drilled:	7/25/78
GEOLOGIC SOURCE	MATERIAL	THICKNESS (FEET)	DEPTH (FEET)
Glacial drift:			
	Sand, very fine to medium; about 30 percent silt; oxidized	6	6
	Clay, yellowish-brown, silty, sandy, oxidized	9	15
	Till, dark-gray, silty, sandy, pebbly	40	55
	Sand, fine to medium, subrounded	1	56
	Till, dark-gray, silty, sandy, pebbly	10	66
	Sand, fine to coarse, gravelly, subangular to rounded	2	68
	Till, dark-gray, silty, sandy, pebbly	21	89
	Till, dark-gray; with lenses of fine sand; subrounded	20	109
	Till, dark-gray, silty, sandy, pebbly	36	145
Fox Hills Sandstone:			
	Sandstone, light-gray, very fine to fine, clayey; interbedded with medium-brown clayey carbonaceous indurated siltstone	15	160

159-080-36BBB
NDSWC 10356

Altitude.	1477 feet	Date drilled:	10/30/78
Glacial drift:			
	Topsoil, brownish-black	1	1
	Till, yellowish-brown, silty, sandy, pebbly	23	24
	Till, olive-gray, silty, pebbly	19	43
	Sand, medium; about 25 percent fine to medium gravel; angular to well rounded	3	46
	Till, dark-gray, silty, pebbly	55	101
	Till, dark-gray, silty, very sandy, pebbly	23	124
	Till, dark-gray, silty, pebbly	13	137
Fox Hills Sandstone:			
	Sandstone, greenish-gray, very fine, clayey; interbedded with thin lenses of light-gray bentonitic moderately indurated siltstone	23	160

TABLE 4.--Chemical analyses of ground water for major constituents

[Chemical analyses of ground water for major constituents are grouped according to aquifer. Values shown for specific conductance and pH are field values measured at the well at the time of inventory.]

PRINCIPAL AQUIFER/ LOCAL IDENTIFIER	DEPTH OF WELL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (umho/cm @ 25°C)	pH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (Ca,Mg) (mg/L)	NON-CARBONATE HARDNESS (mg/L)	DISSOLVED CALCIUM (Ca) (mg/L)	DISSOLVED MAGNESIUM (Mg) (mg/L)	DISSOLVED SODIUM (Na) (mg/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (mg/L)	BICARBONATE (HCO_3) (mg/L)	CARBONATE (CO_3) (mg/L)	DISSOLVED SULFATE (SO_4) (mg/L)	DISSOLVED CHLORIDE (Cl) (mg/L)	DISSOLVED FLUORIDE (F) (mg/L)	DISSOLVED SILICA (SiO_2) (mg/L)	DISSOLVED SOLIDS (RESIDUE AT 180°C) (mg/L)	DISSOLVED NITRATE (NO_3) (mg/L)	DISSOLVED BORON (B) (ug/L)	DISSOLVED IRON (Fe) (ug/L)	DISSOLVED MANGANESE (Mn) (ug/L)
Fox Hills Sandstone																								
151-076-07DDC1	326	10/21/76	3,800	8.5	8.0	51	0	11	5.7	850	97	52	3.9	640	26	11	920	0.3	20	2,070	1.0	2,400	20	40
151-076-07DDC2	254	10/21/76	3,000	8.7	7.0	28	0	4.7	4.0	650	98	53	2.9	725	54	.4	530	.4	14	1,600	1.0	2,700	380	80
151-077-01BCC	270	7/22/75	3,000	8.2	7.5	36	0	7.5	4.3	680	97	49	3.2	744	0	4.1	680	.5	7.2	1,790	1.0	3,100	330	10
152-077-11CCD	350	8/02/58	--	--	--	46	--	2.0	10	1,100	97	--	7.0	459	78	32	1,100	.3	--	2,540	1.8	3,500	430	--
152-077-21CDD	507	9/22/58	--	--	--	58	--	5.0	11	1,100	97	--	8.0	444	40	26	1,300	.4	--	2,890	1.8	3,300	380	--
152-077-30DDA1	410	10/28/76	4,200	8.5	8.0	50	0	13	4.3	890	97	55	4.0	687	11	5.8	960	.2	14	2,160	2.9	3,200	230	40
152-077-30DDA2	330	4/27/77	4,500	8.4	7.0	57	0	10	7.8	800	97	46	3.7	724	23	6.6	820	.3	12	2,080	1.0	2,900	330	70
152-079-13DDD1	457	4/27/77	4,330	8.2	8.8	55	0	11	6.7	950	97	56	4.1	737	26	3.3	1,000	.4	23	2,360	1.0	3,400	480	60
153-077-34ACD	325	7/10/75	4,000	8.0	8.5	48	0	12	4.4	970	98	61	4.8	632	0	4.5	1,200	.6	17	2,430	1.0	3,600	330	0
153-079-30AAA1	467	4/29/77	4,800	8.2	8.5	27	0	8.7	1.3	840	98	70	3.1	991	27	8.2	680	.4	11	2,240	1.0	3,000	210	40
154-075-04AAA1	108	11/02/76	2,700	8.8	7.5	25	0	6.2	2.3	570	98	50	4.1	892	22	3.3	370	.5	31	1,400	4.5	2,900	40	10
154-075-21CDD1	197	10/20/76	1,300	8.8	8.0	15	0	4.2	1.1	340	98	38	2.1	818	22	4.9	27	1.3	38	716	.70	2,300	130	0
154-075-21CDD2	110	10/20/76	700	9.3	6.5	15	0	3.5	1.6	180	96	20	1.1	397	35	13	3.4	.4	19	441	1.0	340	80	0
154-078-31BAA1	345	10/29/76	4,610	8.3	9.0	52	0	15	3.5	1,200	98	70	4.3	626	0	3.3	1,400	.2	21	2,900	1.0	3,600	60	80
155-075-03ADD	61	7/08/75	1,300	8.4	7.5	26	0	8.4	1.2	300	96	26	3.0	721	0	100	4.4	.6	15	828	1.0	870	440	40
155-075-15BBB	111	11/02/76	2,700	8.7	8.7	18	0	5.5	1.1	590	98	60	3.3	949	22	53	310	.5	25	1,590	2.7	3,000	120	0
155-075-23ABB	99	7/08/75	650	7.9	8.5	74	0	19	6.4	120	77	6.1	4.4	373	0	39	1.4	.3	20	410	2.0	200	270	80
155-080-15AAA	311	10/28/76	4,670	8.3	8.0	65	0	18	4.9	1,200	97	65	5.6	592	0	.4	1,600	.1	17	3,180	4.0	2,900	0	10
155-080-15AAA	311	5/04/77	5,680	8.0	8.5	84	0	17	10	1,200	97	57	5.8	585	13	3.3	1,600	.2	17	3,020	1.0	2,400	580	60
155-080-19CCB2	330	7/02/75	4,900	8.0	9.0	36	0	10	2.7	960	98	70	3.4	764	0	7.4	1,100	.5	5.7	2,480	1.0	2,600	860	40
156-075-22CCC	90	11/03/76	3,500	8.6	7.5	31	0	7.0	3.3	710	98	55	4.1	834	11	3.7	600	.3	20	1,790	.90	3,000	870	160
156-077-22CCC	81	8/05/75	1,030	8.9	8.0	12	0	2.6	1.3	260	98	33	1.2	612	24	12	28	.8	14	630	1.0	2,000	0	0
157-076-22DCC	87	7/09/75	1,310	8.2	--	69	0	20	4.6	300	90	16	3.3	731	0	58	51	.6	16	833	4.4	630	270	80
158-079-13CCC	172	5/05/77	5,210	8.4	8.0	64	0	9.6	9.7	1,200	97	65	4.6	690	47	6.6	1,400	.2	12	2,830	1.0	2,300	40	90
Hell Creek Formation																								
151-075-15CBA	228	7/22/75	1,490	7.7	7.5	300	0	75	27	230	62	5.8	6.8	611	0	250	44	.4	16	987	2.5	590	330	740
151-075-23BCC	233	7/22/75	1,700	7.6	7.5	280	0	74	23	290	68	7.5	10	704	0	160	140	.2	21	1,110	2.5	670	580	300
151-076-02CBC2	127	8/01/55	--	--	--	20	--	--	5	580	98	--	3.0	660	56	74	320	.4	--	1,450	.80	4,100	900	--
151-076-02CBC3	127	8/01/55	--	--	--	29	--	--	7	630	97	--	4.0	910	59	120	420	.4	--	1,670	.70	4,000	1,000	--
151-076-03DDA	180	8/01/55	--	--	--	20	--	--	5	560	94	--	2.8	705	77	270	73	.4	--	1,410	1.4	3,800	1,400	--
151-076-07DDC3	210	10/21/76	2,200	8.6	7.5	24	0	5.3	2.7	520	98	46	2.3	917	37	1.2	230	.5	11	1,260	1.0	3,200	710	40
151-076-07DDC4	126	10/20/76	2,000	8.4	7.0	25	0	4.9	3.2	500	97	44	2.4	973	37	89	90	.6	9.6	1,220	1.0	2,700	80	20
151-076-10AAA	117	7/16/75	1,550	8.4	8.0	8	0	2.3	.6	440	99	68	2.0	977	0	6.6	110	.6	7.3	1,100	1.0	3,600	620	0
151-077-29ADD	207	7/22/75	2,500	8.2	8.5	36	0	5.1	6.2	590	97	43	2.7	1,030	0	2.1	370	.5	6.0	1,540	1.0	3,200	250	20
152-076-05CAC	235	7/15/75	2,300	8.2	7.5	19	0	6.1	1.0	670	98	67	3.4	846	0	2.5	540	.6	10	1,660	1.0	3,900	290	10
152-077-30DDA3	240	10/21/76	3,200	8.3	7.5	39	0	8.3	4.5	710	97	49	3.0	769	22	0	650	.3	12	1,790	1.0	3,000	20	0
152-079-13DDD2	130	10/21/76	3,000	8.6	8.0	33	0	8.1	3.2	740	98	56	2.6	936	24	690	74	.4	12	1,960	1.0	1,800	100	0
152-079-13DDD3	312	4/27/77	4,000	8.3	8.0	34	0	7.8	3.5	800	98	60	3.1	859	42	9.9	710	.5	11	1,990	1.0	2,900	150	70
152-080-05DAA	215	7/14/75	2,500	8.1	12.5	20	0	6.3	1.1	710	99	69	2.6	1,160	0	2.9	420	.6	6.8	1,760	1.0	2,900	690	10
153-077-15ADD	119	7/10/75	2,400	8.1	9.0	15	0	4.0	1.2	590	99	66	2.7	978	0	5.4	360	.6	6.0	1,450	1.0	3,300	420	10

PRINCIPAL AQUIFER/ LOCAL IDENTIFIER	DEPTH OF WELL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCT-ANCE (umho/cm @ 25°C)	pH (UNITS)	TEMPER-ATURE (DEG C)	HARD-NESS (Ca,Mg) (mg/L)	NON-CAR-BONATE HARD-NESS (mg/L)	DIS-SOLVED CAL-CIUM (Ca) (mg/L)	DIS-SOLVED MAG-NE-SIUM (Mg) (mg/L)	DIS-SOLVED SODIUM (Na) (mg/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (mg/L)	BICAR-BONATE (HCO_3) (mg/L)	CAR-BONATE (CO_3) (mg/L)	DIS-SOLVED SULFATE (SO_4) (mg/L)	DIS-SOLVED CHLO-RIDE (Cl) (mg/L)	DIS-SOLVED FLUO-RIDE (F) (mg/L)	DIS-SOLVED SILICA (SiO_2) (mg/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C) (mg/L)	DIS-SOLVED NITRATE (NO_3) (mg/L)	DIS-SOLVED BORON (B) (ug/L)	DIS-SOLVED IRON (Fe) (ug/L)	DIS-SOLVED MAN-GANESE (Mn) (ug/L)
Hell Creek Formation, Continued																								
153-079-30AAA2	410	4/29/77	4,000	8.5	7.0	26	0	4.2	3.8	780	98	67	2.8	1,140	80	6.6	480	0.5	3.9	1,930	1.0	2,800	150	40
153-080-22CDB	128	7/14/75	2,500	8.2	9.5	22	0	4.5	2.7	680	98	63	2.2	1,160	0	2.5	410	.5	6.8	1,700	1.0	2,800	420	0
154-078-31BAA2	300	4/28/77	4,030	8.1	9.0	47	0	10	5.4	890	97	56	3.4	756	21	110	880	.3	9.3	2,400	1.0	3,000	210	50
154-079-30AAC	258	7/09/75	2,300	8.2	8.0	19	0	4.8	1.7	550	98	55	2.0	1,130	8	190	83	.5	6.8	1,500	2.5	1,800	670	20
154-079-36CAC	117	7/09/75	3,500	7.7	7.5	290	0	74	26	630	82	16	6.3	858	0	2.1	690	.4	19	1,890	1.0	2,200	2,500	60
155-080-10DCD	104	7/01/75	4,000	8.0	--	150	0	38	13	790	92	28	6.9	742	0	6.6	910	.4	16	2,160	1.0	1,900	860	60
155-080-14AAA	116	7/02/75	4,100	8.2	8.5	39	0	8.3	4.5	870	98	61	3.8	842	0	9.9	890	.4	5.9	2,160	1.0	2,600	210	20
155-080-17BBD	110	7/01/75	3,250	8.0	8.5	17	0	5.8	.6	730	99	77	2.9	983	0	2.5	580	.5	6.6	1,860	1.0	2,100	480	20
155-080-17CAC	164	7/07/75	4,200	8.0	8.0	27	0	8.4	1.5	870	98	73	3.6	829	0	2.5	900	.4	6.1	2,200	1.0	2,200	670	60
Cannonball Member																								
151-077-34BDA	33	7/09/59	--	--	--	520	--	93	89	210	46	--	7.2	444	--	530	13	.3	--	1,290	--	500	1,800	--
153-079-30AAA3	120	10/27/76	1,400	7.8	7.0	12	0	4.1	.5	350	98	44	1.5	728	38	51	43	.9	8.7	852	1.0	2,500	150	40
153-080-25CDC	150	7/14/75	710	8.1	9.5	13	0	4.6	.4	170	96	21	1.8	335	0	100	3.1	.1	12	475	1.0	350	480	0
Tongue River Member																								
151-080-24CBC	159	7/21/75	2,700	8.2	8.0	38	0	6.2	5.5	660	97	47	3.1	1,330	0	380	19	.5	18	1,830	1.0	830	1,100	0
151-080-32DDD	206	7/21/75	1,200	7.0	9.0	620	190	130	72	31	10	.5	6.6	524	0	270	6.3	.1	15	824	.90	630	1,300	380
152-080-29AAD	123	7/14/75	2,200	7.7	7.5	150	0	42	11	670	90	24	3.9	1,200	0	490	79	.4	19	1,920	2.5	1,200	2,000	100
New Rockford aquifer system																								
152-075-07BBB	186	10/20/76	1,550	8.2	7.0	130	0	35	10	340	84	13	6.8	719	15	140	78	.3	18	1,020	.20	790	130	220
152-075-09DDC	93	10/08/70	821	8.0	8.0	210	0	49	20	110	53	3.3	4.9	445	0	84	4.5	.2	24	492	1.8	190	1,400	110
152-075-09DDC	93	8/18/75	640	8.1	8.5	190	0	48	17	81	47	2.6	4.6	401	0	35	3.1	.2	17	480	2.3	760	250	180
152-075-20CCC	263	10/08/70	621	7.8	8.0	260	0	62	25	35	22	.9	5.7	357	0	44	3.0	.1	26	378	1.5	110	400	20
152-075-20CCC	263	8/18/75	680	7.4	8.5	290	0	73	26	31	18	.8	6.2	400	0	34	4.8	.1	18	401	1.0	80	230	580
152-075-36BBB2	95	10/20/76	580	7.6	7.0	280	0	80	19	10	7	.3	3.9	333	5	28	3.2	.1	25	352	1.0	150	190	920
152-076-24BDB	85	7/16/75	620	7.7	8.5	400	120	110	30	16	8	.3	4.6	345	0	140	12	.2	19	527	2.0	310	2,300	730
153-076-05DDD	263	10/02/70	1,890	8.0	8.0	140	0	29	15	400	86	15	6.7	779	0	170	140	.1	26	1,080	2.0	490	30	10
153-076-05DDD	263	8/11/75	1,750	7.6	8.0	170	0	50	11	410	83	14	5.9	860	0	140	150	.3	13	1,230	1.0	200	380	260
153-076-08DCD	163	10/01/70	560	7.9	8.0	260	0	66	23	14	10	.4	3.4	324	0	23	1.1	.1	24	281	1.0	80	3,000	60
153-076-08DCD	163	8/11/75	480	7.6	7.5	270	0	73	21	15	11	.4	3.5	350	0	16	3.2	.4	11	339	1.0	40	3,300	340
153-076-10DDC	190	7/10/75	1,350	7.3	8.0	470	0	140	29	170	43	3.4	13	956	0	24	25	.2	21	892	2.5	240	4,100	400
153-076-12DDD1	172	10/19/76	650	7.5	8.0	170	0	46	13	89	53	3.0	3.4	423	6	.8	6.4	.3	28	378	1.0	0	2,300	240
153-076-13DDD	124	10/20/76	2,000	8.1	7.5	520	38	140	41	260	51	5.0	14	587	0	470	84	.2	26	1,320	1.0	420	0	720
153-076-25AAA1	198	10/20/76	1,400	7.6	7.5	560	43	160	39	120	31	2.2	13	630	0	300	13	.1	27	1,000	.20	530	460	1,300
153-077-02ADD	156	5/23/78	1,050	7.4	9.0	230	0	62	18	200	65	5.7	6.3	734	0	25	36	.2	25	721	1.0	240	2,600	120
153-077-02CCC	204	8/19/75	780	7.6	9.0	210	0	49	21	96	49	2.9	5.9	403	0	47	28	.1	16	463	4.1	160	2,100	240
154-077-17CCC	143	5/18/76	780	8.0	8.0	270	0	73	21	71	36	1.9	5.0	459	0	18	19	.2	29	454	2.0	640	1,100	240
154-077-18CCC	178	6/24/76	590	7.7	8.0	240	0	66	18	45	28	1.3	5.1	394	0	11	5.0	.3	27	355	1.0	110	1,300	300
154-077-21DCC	203	11/07/78	1,150	7.5	8.0	140	0	43	7.9	290	81	11	6.1	688	0	73	80	.4	21	895	3.2	350	280	60

PRINCIPAL AQUIFER/ LOCAL IDENTIFIER	DEPTH OF WELL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCT-ANCE (umho/cm @ 25°C)	pH (UNITS)	TEMPER-ATURE (DEG C)	HARD-NESS (Ca,Mg) (mg/L)	NON-CAR-BONATE HARD-NESS (mg/L)	DIS-SOLVED CAL-CIUM (Ca) (mg/L)	DIS-SOLVED MAG-NE-SIUM (Mg) (mg/L)	DIS-SOLVED SODIUM (Na) (mg/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (mg/L)	BICAR-BONATE (HCO_3) (mg/L)	CAR-BONATE (CO_3) (mg/L)	DIS-SOLVED SULFATE (SO_4) (mg/L)	DIS-SOLVED CHLO-RIDE (Cl) (mg/L)	DIS-SOLVED FLUO-RIDE (F) (mg/L)	DIS-SOLVED SILICA (SiO_2) (mg/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C) (mg/L)	DIS-SOLVED NITRATE (NO_3) (mg/L)	DIS-SOLVED BORON (B) (ug/L)	DIS-SOLVED IRON (Fe) (ug/L)	DIS-SOLVED MAN-GANESE (Mn) (ug/L)
New Rockford aquifer system, Continued																								
154-077-22CCC	233	11/07/78	1,530	8.2	8.5	110	0	27	10	420	89	17	5.3	834	0	130	150	0.3	24	1,170	4.5	440	430	0
154-077-27ADD	84	5/10/76	470	7.4	9.0	160	0	42	13	49	39	1.7	3.3	308	0	7.4	2.6	.2	28	290	1.0	760	2,000	380
154-077-27CDD	204	8/12/75	1,100	8.1	8.0	150	0	40	12	240	77	8.5	4.7	633	0	64	55	.3	12	762	1.0	350	80	60
154-077-27DBB	198	5/11/76	1,720	7.7	9.0	110	0	32	7.3	370	87	15	4.6	793	0	120	130	.6	33	1,070	1.0	960	1,100	50
154-077-28ABD	215	7/26/77	980	8.2	9.0	160	0	44	12	210	73	7.2	4.7	606	0	62	55	.2	21	755	1.0	210	1,200	70
154-077-28ABD	215	11/14/78	1,130	7.7	10.0	140	0	--	12	200	75	7.3	4.4	528	0	58	55	.2	18	703	1.1	220	1,200	80
154-077-28ABD	215	11/16/78	1,120	7.7	11.0	150	0	--	12	200	74	7.1	4.7	553	0	63	52	.3	21	594	.10	190	1,200	60
154-077-28ABD	215	11/17/78	1,120	7.7	10.0	170	0	--	12	200	71	6.7	4.4	412	0	62	35	.3	18	725	1.2	350	1,500	80
154-077-28ADB1	203	11/07/78	975	8.6	8.5	200	0	50	18	200	68	6.1	5.0	592	0	61	75	.3	21	742	3.6	280	100	60
154-077-28ADB2	203	11/07/78	1,100	7.7	8.8	200	0	51	18	210	69	6.4	4.7	615	0	63	58	.3	25	735	.30	420	610	80
154-077-28ADD1	180	5/13/76	980	8.1	9.0	180	0	49	14	170	67	5.5	4.6	543	0	52	31	.2	30	609	1.0	480	460	80
154-077-28ADD2	203	11/07/78	1,050	8.1	8.5	170	0	50	11	200	71	6.7	4.8	581	0	58	43	.3	22	678	1.0	190	60	20
154-077-29ADA	203	11/07/78	425	8.1	8.5	160	0	44	12	37	33	1.3	2.7	265	0	18	3.3	.1	20	265	.50	160	220	140
154-077-29BBB	208	5/17/76	420	7.7	9.0	220	0	65	14	3.1	3	.1	1.1	271	0	5.8	1.2	.1	29	235	1.0	40	1,200	360
154-077-29CCC	151	8/12/75	1,900	8.3	8.0	83	0	19	8.6	450	92	21	4.1	871	0	3.3	230	.6	11	1,170	1.0	2,200	420	60
154-077-30CDB1	162	7/09/75	390	7.6	8.5	200	0	51	18	14	13	.4	1.7	245	0	21	2.6	.1	18	267	1.0	160	1,100	240
154-077-30CDB2	194	7/26/77	410	8.2	9.0	200	1	55	15	9.7	9	.3	1.7	243	0	15	29	.7	19	298	1.0	0	1,500	300
154-077-32DAD	137	5/06/76	1,100	8.4	--	35	0	2.3	7.2	280	94	21	2.6	686	8	21	30	1.3	25	741	1.4	2,700	230	20
154-077-35BBB2	174	8/12/75	600	7.7	8.5	180	0	51	13	77	48	2.5	2.9	396	0	18	8.1	.1	12	397	1.0	80	1,100	240
154-077-35BCA1	144	8/12/75	530	7.6	8.5	250	0	63	23	33	22	.9	1.9	355	0	21	2.9	.1	13	328	1.0	80	1,600	320
154-077-35BCA2	148	7/26/77	520	8.1	9.0	220	0	62	16	29	22	.8	2.0	334	0	8.6	3.9	0	19	328	1.0	30	2,900	560
154-077-35BCA2	148	4/20/76	500	7.6	9.0	240	0	66	18	23	17	.6	2.4	335	0	12	1.8	.1	19	304	2.5	200	2,900	320
154-077-35BCA2	148	4/20/76	500	7.6	9.0	240	0	65	19	22	17	.6	2.1	335	0	7.4	1.7	.1	19	315	1.0	40	3,000	380
154-077-35BCA2	148	4/20/76	500	7.6	9.0	240	0	65	19	22	17	.6	1.9	335	0	9.5	1.6	.1	19	281	1.0	40	3,100	380
154-077-35BCA2	148	4/21/76	500	7.6	9.0	240	0	63	20	22	17	.6	2.1	332	0	8.2	1.8	.1	19	272	1.0	160	2,900	400
154-077-35BCA2	148	4/21/76	500	7.6	9.0	240	0	64	20	22	17	.6	2.1	331	0	11	1.8	.1	19	285	2.5	120	3,000	320
154-077-35BCA2	148	4/21/76	500	7.6	9.0	240	0	64	20	22	16	.6	2.1	337	0	9.9	1.8	.1	19	288	1.0	160	2,900	340
154-077-35BCA2	148	4/22/76	500	7.6	9.0	240	0	62	21	23	17	.6	2.2	335	0	9.5	1.4	.1	19	271	1.0	40	3,000	340
154-077-35BDD	80	8/12/75	430	7.4	8.5	190	0	51	15	24	21	.8	1.3	260	0	29	3.1	.1	9.4	273	1.0	0	920	400
154-078-14CCC	61	8/13/75	650	7.8	8.0	210	0	56	17	73	42	2.2	4.3	437	0	16	6.3	.3	10	426	1.0	350	1,200	160
154-078-19DCD	93	5/25/78	1,590	7.2	9.5	610	46	170	45	140	33	2.5	6.0	688	0	300	34	.2	30	1,070	1.0	0	3,400	250
154-078-24CCC	224	6/24/76	380	7.2	8.5	220	0	61	17	9.8	8.8	.3	2.2	279	0	6.2	1.3	.1	27	281	1.0	0	1,400	300
154-078-25CBB1	140	7/15/76	418	7.0	8.5	200	18	55	15	13	12	.4	1.5	222	0	39	1.0	.1	23	328	.10	0	850	120
154-078-26ACD	232	7/25/77	440	8.8	9.0	200	4	54	16	16	15	.5	1.5	213	13	35	2.2	.1	18	300	1.0	0	1,300	220
154-078-26BBB	234	8/12/75	480	8.0	8.0	250	13	67	20	13	10	.4	2.0	289	0	34	1.5	.1	11	321	1.0	0	210	480
154-078-26CAA	150	7/15/76	440	7.3	8.0	190	25	51	15	6.8	7	.2	1.8	202	0	26	.5	0	22	287	3.6	0	0	10
154-079-14CCC1	242	5/30/78	2,700	7.7	9.5	710	270	220	39	440	57	7.2	10	533	0	1,100	39	.1	26	2,120	1.0	0	4,000	240
154-079-14CCC1	242	7/13/78	2,700	7.7	9.5	800	210	210	67	440	54	6.8	11	716	0	1,100	38	.2	20	2,340	1.0	490	2,700	280
154-079-14CCC2	130	5/30/78	1,700	7.7	8.0	570	180	190	23	220	45	4.0	8.8	472	0	610	16	.1	26	1,320	1.0	200	2,500	150
154-079-14CCC2	130	7/13/78	2,000	7.6	9.5	730	190	200	56	220	39	3.5	9.3	660	0	630	17	.2	19	1,500	1.0	0	2,200	170

PRINCIPAL AQUIFER/ LOCAL IDENTIFIER	DEPTH OF WELL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCT-ANCE (umho/cm @ 25°C)	pH (UNITS)	TEMPER-ATURE (DEG C)	HARD-NESS (Ca,Mg) (mg/L)	NON-CAR-BONATE HARD-NESS (mg/L)	DIS-SOLVED CAL-CIUM (Ca) (mg/L)	DIS-SOLVED MAG-NE-SIUM (Mg) (mg/L)	DIS-SOLVED SODIUM (Na) (mg/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (mg/L)	BICAR-BONATE (HCO_3) (mg/L)	CAR-BONATE (CO_3) (mg/L)	DIS-SOLVED SULFATE (SO_4) (mg/L)	DIS-SOLVED CHLO-RIDE (Cl) (mg/L)	DIS-SOLVED FLUO-RIDE (F) (mg/L)	DIS-SOLVED SILICA (SiO_2) (mg/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C) (mg/L)	DIS-SOLVED NITRATE (NO_3) (mg/L)	DIS-SOLVED BORON (B) (ug/L)	DIS-SOLVED IRON (Fe) (ug/L)	DIS-SOLVED MAN-GANESE (Mn) (ug/L)
New Rockford aquifer system, Continued																								
154-079-16CCC	186	4/27/78	2,400	7.5	8.5	1,000	480	270	79	280	37	3.8	13	639	0	980	18	0.1	24	2,000	2.5	0	7,500	200
154-079-24DDD	256	4/26/78	2,800	8.3	9.0	490	0	130	40	470	67	9.2	9.7	724	0	640	150	.1	25	1,770	2.5	540	530	140
154-080-20BBB	163	9/28/70	2,390	7.7	8.5	590	130	130	63	350	56	6.2	11	563	0	800	62	.3	24	1,700	4.8	140	7,300	40
154-080-20BBB	163	8/19/75	2,500	7.5	8.5	700	140	160	73	330	50	5.4	12	682	0	760	71	.1	16	1,830	1.0	120	5,200	160
154-080-23CCC	183	9/29/70	2,140	7.8	8.5	480	16	110	51	330	60	6.6	10	560	0	680	42	.3	23	1,510	2.5	50	9,300	20
154-080-23CCC	183	8/14/75	2,300	7.8	7.5	920	380	210	96	240	36	3.4	9.6	655	0	830	25	.2	11	1,860	1.0	160	4,500	160
154-080-24DAA	274	7/14/78	1,900	7.8	9.0	990	510	250	89	150	25	2.1	9.9	584	0	790	4.3	.1	20	1,730	1.0	390	4,600	220
Voltaire aquifer																								
151-076-08BBB	80	10/21/55	--	--	--	240	--	54	25	13	9	--	1.8	216	--	34	--	--	--	335	.40	120	1,200	--
152-078-16CBA	41	4/27/78	3,100	7.2	9.0	570	0	130	60	590	69	11	16	1,290	0	730	50	.2	35	2,230	1.0	340	9,800	640
152-079-08BCC	45	4/27/78	1,000	7.6	9.0	260	0	60	27	130	52	3.5	3.8	354	0	240	6.0	.1	23	660	2.0	50	1,200	200
153-079-31CAB	70	7/15/75	990	7.5	7.5	350	60	89	31	120	42	2.8	5.3	354	0	310	6.2	.1	16	754	1.0	350	3,800	640
153-079-31CAC	67	7/15/75	1,100	7.7	7.0	360	52	94	30	150	47	3.4	5.6	375	0	370	5.2	.1	15	890	1.0	310	1,500	640
153-079-31CBB	56	7/15/75	1,600	7.4	8.0	600	260	150	55	230	45	4.1	6.7	414	0	730	31	.1	16	1,450	1.0	550	5,700	760
153-080-25BCD	60	7/17/75	610	7.5	9.5	230	0	58	21	79	42	2.3	5.3	354	0	110	3.9	.1	16	481	1.0	200	3,000	580
153-080-36AAC2	101	3/09/73	840	7.6	--	260	4	63	26	90	42	2.4	8.0	316	0	190	4.7	.1	23	537	1.0	210	2,500	420
Denbigh aquifer system																								
156-077-03DDD	156	8/22/78	500	7.4	9.0	75	0	17	7.9	130	78	6.5	3.7	300	0	60	36	.4	6.3	398	1.0	290	140	40
156-077-08BBB	108	7/07/76	460	7.4	8.0	210	0	53	19	16	14	.5	2.4	275	0	15	1.5	.2	28	263	1.0	40	960	280
156-077-10BBB	159	8/02/78	2,650	8.4	9.0	49	0	12	4.6	600	96	37	4.2	760	10	2.5	510	.6	25	1,520	1.0	1,200	200	0
156-077-13BBB2	40	8/05/75	570	8.1	8.0	330	4	74	35	11	7	.3	3.5	398	0	18	.6	.5	20	350	1.0	0	560	360
156-077-13CCB1	126	8/06/75	2,300	8.4	8.0	68	0	15	7.4	490	94	26	3.9	531	5	0	520	.7	16	1,340	1.0	1,200	440	20
156-077-13CCB2	56	8/07/75	400	7.7	7.5	240	9	67	18	7.6	6	.2	3.3	282	0	15	1.8	.2	16	274	1.0	0	1,500	260
156-077-16DDD2	40	10/13/70	540	8.0	8.0	280	0	71	24	18	12	.5	2.0	337	0	22	4.4	.1	18	306	0	280	1,500	10
156-077-16DDD2	40	8/05/75	550	7.8	7.5	300	0	80	24	12	8	.3	2.0	375	0	16	2.6	.2	20	364	2.0	0	2,600	340
156-077-17AAA	47	7/07/76	770	7.2	8.5	370	0	83	40	22	11	.5	5.6	478	0	34	3.9	.1	26	461	1.0	110	2,900	240
156-077-22DBA2	51	7/15/75	1,000	7.5	9.5	250	0	68	20	140	55	3.9	2.3	520	0	24	76	.4	15	649	1.0	120	130	240
156-077-22DBC	36	7/15/75	700	7.5	8.5	250	0	68	20	60	34	1.7	3.4	417	0	28	19	.2	10	434	1.0	0	2,500	240
156-077-23ADC	62	7/15/75	540	7.4	8.5	280	0	81	19	11	8	.3	1.9	343	0	15	6.1	.2	16	339	1.0	0	2,600	360
156-077-23DBD	62	7/15/75	740	7.5	9.5	250	0	72	17	80	41	2.2	2.9	439	0	19	40	.2	17	441	1.0	0	2,300	240
156-077-24CCC	51	8/05/75	530	7.8	8.0	260	0	68	22	24	17	.6	1.8	332	0	35	5.7	.2	18	350	1.0	0	2,700	260
156-077-24CDD	56	8/05/75	540	7.7	9.0	270	0	70	23	22	15	.6	2.0	364	0	4.9	4.7	.2	19	303	1.0	200	3,500	200
156-077-27AAA	31	8/04/75	520	7.9	7.5	280	6	75	23	16	11	.4	1.4	334	0	25	2.9	.1	17	316	1.0	0	1,200	320
156-077-29BBC	31	8/05/75	650	7.8	7.5	350	0	93	29	18	10	.4	2.8	428	0	22	2.2	.1	18	415	2.0	0	4,100	160

PRINCIPAL AQUIFER/ LOCAL IDENTIFIER	DEPTH OF WELL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (umho/cm @ 25°C)	pH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (Ca,Mg) (mg/L)	NON-CARBONATE HARDNESS (mg/L)	DISSOLVED CALCIUM (Ca) (mg/L)	DISSOLVED MAGNESIUM (Mg) (mg/L)	DISSOLVED SODIUM (Na) (mg/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (mg/L)	BICARBONATE (HCO_3) (mg/L)	CARBONATE (CO_3) (mg/L)	DISSOLVED SULFATE (SO_4) (mg/L)	DISSOLVED CHLORIDE (Cl) (mg/L)	DISSOLVED FLUORIDE (F) (mg/L)	DISSOLVED SILICA (SiO_2) (mg/L)	DISSOLVED SOLIDS (RESIDUE AT 180°C) (mg/L)	DISSOLVED NITRATE (NO_3) (mg/L)	DISSOLVED BORON (B) (ug/L)	DISSOLVED IRON (Fe) (ug/L)	DISSOLVED MANGANESE (Mn) (ug/L)
Butte aquifer																								
151-078-16CCB	79	9/06/78	1,300	7.6	9.0	80	0	24	4.9	330	89	16	4.6	660	0	210	33	0.5	23	921	1.2	290	0	60
151-078-17AAA	128	9/06/78	850	7.6	11.0	75	0	21	5.5	220	85	11	6.3	461	0	120	28	.4	24	655	1.0	420	80	130
151-078-21CBB1	192	8/22/78	1,380	8.0	9.0	110	0	31	7.9	280	84	12	5.6	635	0	160	37	.3	21	847	.70	200	280	140
151-078-21CBB2	76	7/24/75	1,200	7.9	7.5	190	0	44	19	210	70	6.6	5.0	565	0	190	10	.2	17	824	1.0	670	520	120
151-078-27CDC	41	7/21/75	1,300	7.7	7.0	170	0	44	15	240	75	8.0	3.6	500	0	270	11	.2	15	855	1.0	590	1,200	220
Cut Bank Creek aquifer																								
157-078-13CCC	96	8/02/78	530	7.9	8.5	240	0	67	18	21	16	.6	5.0	347	0	12	1.2	.2	26	325	1.0	30	550	400
157-078-23DDD	128	8/02/78	610	7.9	9.0	210	0	68	9.9	44	31	1.3	4.9	316	0	43	2.5	.2	26	390	.20	30	340	340
158-079-22AAA3	134	8/03/78	1,110	8.4	8.0	41	0	10	3.9	270	93	18	2.4	554	4	2.5	110	.6	25	703	1.0	360	320	20
158-079-23DCC	143	8/03/78	1,650	8.3	8.5	40	0	8.6	4.5	380	95	26	2.6	616	0	2.5	250	.6	24	974	1.0	750	510	80
Martin aquifer system																								
151-075-22ADD	102	9/22/58	--	--	--	380	--	99	32	48	3	--	11	339	--	160	--	.3	--	626	.50	500	160	--
151-075-22ADD	102	7/22/75	880	7.4	7.5	410	74	110	33	45	19	1.0	8.7	410	0	160	6.3	.2	19	618	2.5	280	170	600
151-075-23DD	182	7/22/75	1,800	7.9	9.5	83	0	18	9.2	390	90	19	5.0	769	0	250	44	.5	18	1,150	2.5	1,800	1,200	60
151-076-23BCC	55	3/29/67	670	7.8	6.0	280	0	63	29	49	27	1.3	4.1	388	0	56	5.2	.2	22	400	0	170	340	--
151-076-23BCC	55	7/16/75	1,100	7.5	7.0	430	0	82	55	160	44	3.4	7.4	554	0	310	7.5	.2	15	909	1.0	350	1,200	160
151-076-23CBB	--	10/04/55	--	--	--	230	--	46	29	60	31	--	3.2	315	--	34	--	--	--	400	--	150	400	--
Karlsruhe aquifer																								
153-077-07BDC1	45	5/19/70	789	7.6	6.0	180	0	53	12	100	54	3.3	4.2	347	0	110	16	.2	24	504	0	340	100	170
153-077-07BDC2	58	7/10/75	810	7.5	7.5	350	66	83	35	52	24	1.2	4.5	346	0	110	51	.2	18	512	1.0	0	1,700	300
153-078-02CAA	50	7/26/77	1,500	8.0	9.5	400	0	68	56	250	57	5.4	10	929	0	170	21	.1	20	1,130	1.0	240	570	340
154-078-35BCC2	45	7/15/76	650	7.3	10.0	320	0	74	33	29	16	.7	2.6	439	0	17	2.1	.1	26	475	1.0	80	580	320
Lake Souris aquifers																								
151-075-03ADA	16	7/09/59	--	--	--	370	-	77	43	40	19	--	7.0	384	16	220	--	.2	--	764	--	300	1,200	--
152-076-10ACD	18	9/22/58	--	--	--	290	--	55	36	270	53	--	10	624	--	230	6.0	.2	--	1,050	.20	1,100	--	--
153-075-31DCC	46	7/16/75	1,100	7.3	8.0	410	0	100	39	200	51	4.3	7.7	691	0	220	55	.3	17	1,010	1.0	280	900	600
153-076-03DDD	41	6/29/76	460	7.9	8.5	240	0	63	20	9.4	8	.3	2.5	297	0	12	5.4	.2	28	279	1.0	0	40	410
153-076-12DDD2	50	10/19/76	520	7.7	7.5	270	0	76	19	12	9	.3	3.6	332	7	12	1.3	.2	25	288	1.0	40	1,300	660
154-075-04AAA2	34	11/02/76	425	8.2	7.0	190	0	54	13	16	15	.5	2.2	260	5	5.4	1.9	0	24	277	1.0	150	540	320
154-076-04CCC	36	5/16/78	1,120	7.2	10.0	380	0	82	43	170	49	3.8	10	895	0	4.9	13	.2	30	822	2.0	440	5,600	100
154-076-21CCC	39	6/29/76	870	7.5	8.0	430	18	99	44	38	16	.8	3.3	503	0	83	3.2	.2	27	557	1.0	0	3,200	180
155-076-10BBA2	36	8/07/75	440	7.7	8.0	240	0	66	18	6.4	5	.2	3.6	296	0	7.0	1.0	.1	15	271	1.0	0	980	460
155-076-10CCC	26	8/07/75	500	7.8	8.5	240	0	67	18	15	26	.4	4.5	299	0	33	1.0	.1	15	304	2.0	0	830	400
155-076-21AAA	40	10/13/70	560	7.9	8.0	280	4	77	21	17	12	.4	2.6	333	0	36	4.5	.1	23	316	1.0	50	8,400	20
155-076-21AAA	40	8/07/75	560	7.9	8.5	290	17	83	20	12	8	.3	3.2	333	0	29	6.1	.1	15	370	1.0	40	1,900	520
155-076-28BBB	26	8/07/75	520	7.7	8.0	260	0	64	24	17	12	.5	3.6	325	0	21	.8	.1	15	310	1.0	40	3,800	200
155-077-17AAA	40	8/13/75	370	8.1	8.5	200	0	54	16	7.4	7	.2	2.7	253	0	5.8	0	.1	11	232	2.5	80	420	420
155-078-16DDD	20	10/14/70	1,050	7.8	8.0	450	130	74	64	74	26	1.5	7.9	387	0	290	3.7	0	20	713	1.0	280	3,600	20

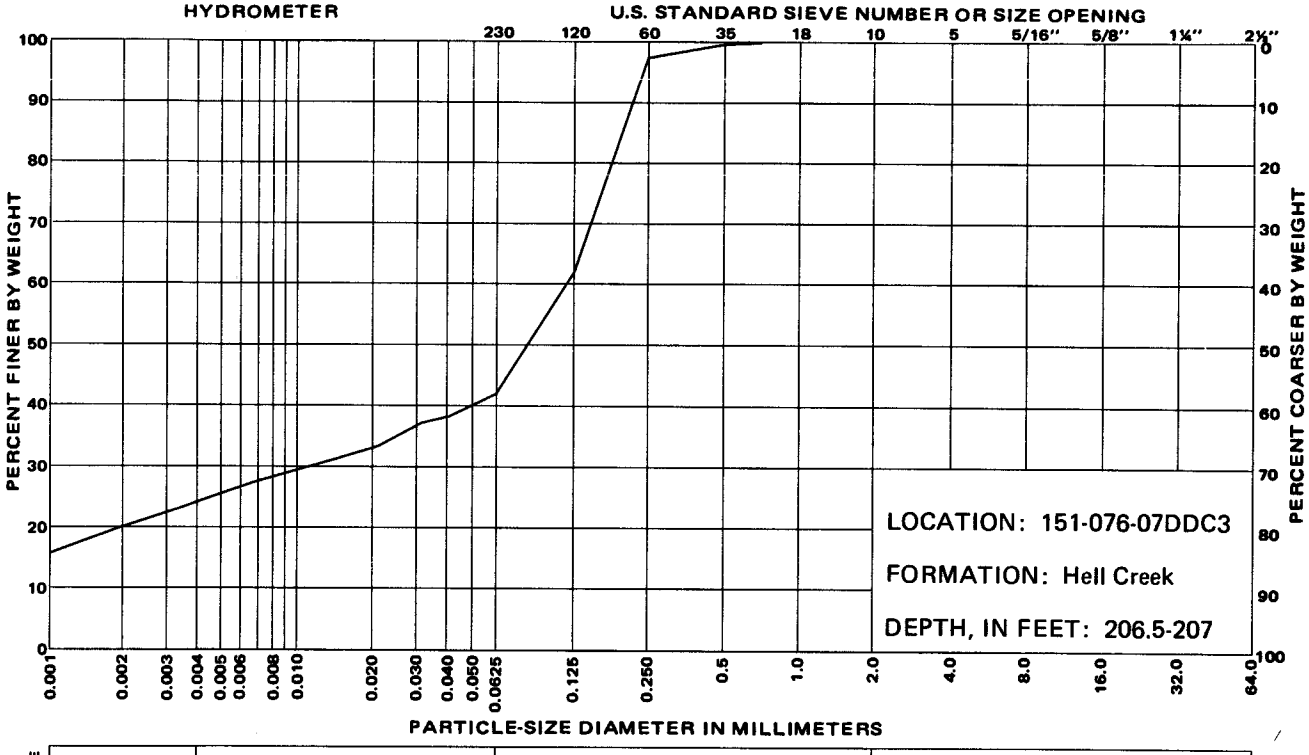
PRINCIPAL AQUIFER/ LOCAL IDENTIFIER	DEPTH OF WELL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (umho/cm @ 25°C)	pH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (Ca,Mg) (mg/L)	NONCARBONATE HARDNESS (mg/L)	DISSOLVED CALCIUM (Ca) (mg/L)	DISSOLVED MAGNESIUM (Mg) (mg/L)	DISSOLVED SODIUM (Na) (mg/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (mg/L)	BICARBONATE (HCO_3) (mg/L)	CARBONATE (CO_3) (mg/L)	DISSOLVED SULFATE (SO_4) (mg/L)	DISSOLVED CHLORIDE (Cl) (mg/L)	DISSOLVED FLUORIDE (F) (mg/L)	DISSOLVED SILICA (SiO_2) (mg/L)	DISSOLVED SOLIDS (RESIDUE AT 180°C) (mg/L)	DISSOLVED NITRATE (NO_3) (mg/L)	DISSOLVED BORON (B) (ug/L)	DISSOLVED IRON (Fe) (ug/L)	DISSOLVED MANGANESE (Mn) (ug/L)
Lake Souris aquifers, Continued																								
155-078-16DDD	20	8/13/75	1,500	7.9	8.5	720	270	120	100	110	25	1.8	11	544	0	510	2.4	0.1	11	1,190	1.0	0	1,300	760
155-078-19ABB	20	7/03/75	490	7.2	8.5	250	22	71	18	4.0	3	.1	1.2	278	0	32	3.2	.1	13	276	1.0	40	340	400
158-077-06ADD	17	7/10/75	1,860	7.0	9.5	1,100	770	210	160	21	4	.3	11	530	0	760	25	.2	13	1,620	1.0	240	120	640
158-077-08DDA	25	6/07/51	609	--	--	280	--	58	33	22	14	--	2.3	214	14	72	17	.2	18	406	41	--	390	--
158-078-20DAD	18	7/10/75	1,350	7.1	7.5	590	87	150	57	34	9	.6	86	638	0	130	65	.2	15	964	79	0	60	720
158-079-22AAA1	20	11/02/77	560	7.8	9.0	310	10	71	31	12	8	.3	3.3	360	0	35	2.4	.2	24	333	.01	40	130	330
158-079-22AAA2	13	6/11/51	1,630	--	--	630	--	170	47	33	8	--	130	446	0	220	59	.2	21	1,080	220	--	2,600	--
159-078-10BAD1	66	7/09/75	1,850	7.4	9.0	400	0	94	40	290	61	6.3	7.8	519	0	260	260	.4	16	1,250	2.5	750	670	140
Souris Valley aquifer																								
154-077-06DCB	53	7/09/75	2,200	7.8	6.0	150	0	33	16	460	87	16	3.8	820	0	450	18	.4	9.4	1,390	2.0	1,700	420	100
154-078-10ADD	88	4/26/78	2,250	8.2	9.0	130	0	30	13	530	89	20	4.2	890	0	1.6	390	.5	23	1,470	2.0	1,100	1,300	0
154-078-20CCC	57	5/24/78	590	7.6	9.0	210	0	56	17	52	35	1.6	2.7	389	0	7.4	2.7	.1	25	327	1.0	100	1,900	100
155-077-24BDC	90	7/08/75	530	7.4	8.5	200	0	52	17	29	23	.9	5.1	268	0	27	7.9	.2	12	278	18	80	60	60
155-077-26BAA	76	4/26/78	430	7.9	9.0	210	0	50	21	19	16	.6	2.1	281	0	1.6	9.3	.1	24	229	2.5	240	830	20
155-077-27ABD	51	4/26/78	480	7.7	8.0	250	0	65	21	6.6	5	.2	1.6	311	0	.4	2.9	.1	24	234	2.5	100	4,000	380
156-076-08AAB	25	10/14/70	590	8.1	8.0	280	4	68	27	26	16	.7	2.7	340	0	44	6.4	.1	16	332	1.0	420	220	290
156-076-09ABC	40	5/02/78	1,300	7.6	8.0	170	0	37	19	250	76	8.3	3.6	514	0	240	16	.2	25	821	2.5	50	1,300	40
156-076-11BAB	41	7/15/75	650	7.4	10.0	310	61	77	29	27	16	.7	2.8	303	0	93	21	.1	13	435	1.0	0	2,000	320
156-076-11BAC	42	7/15/75	650	7.4	8.5	300	51	81	24	28	17	.7	2.1	304	0	92	19	.1	14	347	1.0	350	2,600	320
157-075-20BBB2	40	11/03/76	530	8.1	8.0	260	1	70	21	12	9	.3	1.9	304	6	28	3.1	0	20	337	1.0	300	730	700
157-075-31AAB2	30	11/03/66	620	8.0	8.0	280	28	77	22	21	14	.5	3.0	311	0	70	6.7	.1	21	383	.10	80	2,900	--
157-075-31DAD	40	7/08/75	420	7.4	8.5	230	4	60	20	11	9	.3	1.7	276	0	26	2.5	.1	15	290	1.0	0	630	220
157-075-31DBC	40	7/08/75	560	7.2	8.5	310	98	84	24	8.1	5	.2	2.2	258	0	88	3.7	.1	13	399	26	0	20	360
157-075-31DBD	40	7/08/75	500	7.5	9.0	270	53	73	21	10	7	.3	2.1	264	0	61	2.6	.1	13	343	14	0	60	180
157-075-31DCC	44	7/08/75	880	7.1	8.5	510	230	120	51	12	5	.2	3.0	340	0	210	19	.1	12	635	6.1	280	890	540
157-075-31DDA	26	7/08/75	480	7.3	8.5	260	15	69	21	13	10	.4	1.4	299	0	36	2.5	.1	13	298	2.5	0	80	240
157-075-31DDB	35	7/08/75	730	7.3	8.5	380	150	110	26	11	6	.2	2.9	283	0	150	4.3	.1	10	548	18	120	210	580
157-076-12ABB	42	7/16/75	690	7.4	--	330	50	85	29	29	16	.7	2.1	341	0	84	12	.1	17	432	1.0	0	4,600	880
157-076-14BBB	42	5/01/78	1,500	7.6	8.5	160	0	41	14	330	81	11	5.1	759	0	74	130	.4	24	1,010	2.8	780	850	240
157-076-34BAA	21	8/06/75	1,300	8.0	8.5	340	0	68	41	190	54	4.5	4.5	536	0	240	58	.6	16	900	1.0	240	270	120
158-076-14CDC	34	5/01/78	840	7.3	9.0	420	0	110	35	69	26	1.5	4.0	530	0	110	6.0	.1	25	625	1.0	50	4,600	800
159-077-05ADD	48	7/10/75	4,000	7.2	7.5	1,900	1,100	230	300	210	20	2.1	11	911	0	1,200	140	.5	16	2,660	19	0	230	300
Outwash deposits																								
156-078-33BBB	51	8/03/78	850	7.6	8.0	410	0	95	42	43	18	.9	4.4	578	0	11	3.4	.1	28	539	1.0	160	2,600	640
157-080-30AAA	15	7/17/75	660	8.0	9.0	370	120	83	40	23	12	.5	3.9	300	0	150	23	.1	13	485	2.0	0	40	180
157-080-30ABA	27	7/16/75	720	7.1	10.0	410	120	100	39	20	9	.4	4.8	355	0	150	12	.1	14	551	1.0	0	2,900	880

PRINCIPAL AQUIFER/ LOCAL IDENTIFIER	DEPTH OF WELL (FEET)	DATE OF SAMPLE	SPECIFIC CONDUCT-ANCE (umho/cm @ 25°C)	pH (UNITS)	TEMPER-ATURE (DEG C)	HARD-NESS (Ca,Mg) (mg/L)	NON-CAR-BONATE HARD-NESS (mg/L)	DIS-SOLVED CAL-CIUM (Ca) (mg/L)	DIS-SOLVED MAG-NE-SIUM (Mg) (mg/L)	DIS-SOLVED SODIUM (Na) (mg/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (mg/L)	BICAR-BONATE (HCO_3) (mg/L)	CAR-BONATE (CO_3) (mg/L)	DIS-SOLVED SULFATE (SO_4) (mg/L)	DIS-SOLVED CHLO-RIDE (Cl) (mg/L)	DIS-SOLVED FLUO-RIDE (F) (mg/L)	DIS-SOLVED SILICA (SiO_2) (mg/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180°C) (mg/L)	DIS-SOLVED NITRATE (NO_3) (mg/L)	DIS-SOLVED BORON (B) (ug/L)	DIS-SOLVED IRON (Fe) (ug/L)	DIS-SOLVED MAN-GANESE (Mn) (ug/L)
Buried outwash deposits																								
153-080-14BBB	93	9/30/70	1,760	7.7	8.5	610	280	150	60	190	40	3.3	8.8	398	0	670	10	.3	23	1,300	1.0	160	1,300	20
153-080-14BBB	93	8/14/75	2,200	7.9	8.5	1,000	600	240	97	160	26	2.2	8.7	482	0	910	9.3	.2	10	1,770	1.0	80	1,400	600
154-075-30DDD	80	10/19/76	500	7.8	7.5	150	0	39	13	61	46	2.2	3.5	308	2	19	2.4	.1	24	317	2.5	300	0	520
154-078-07BBC	171	7/09/75	540	7.5	8.5	220	0	58	18	24	19	.7	2.9	307	0	26	3.4	.2	17	295	1.0	40	4,200	200
155-080-06CDD	60	7/01/75	1,030	7.7	8.5	160	0	41	14	160	68	3.4	5.0	421	0	160	8.1	.3	17	612	1.0	240	340	100
155-080-07CBB	150	7/01/75	1,280	9.1	10.5	9	0	3.5	.1	430	99	14	1.6	820	54	100	75	.7	5.8	1,100	1.5	2,200	320	10
155-080-10ABA	42	7/01/75	1,080	7.4	7.5	340	0	92	27	99	38	2.3	7.2	451	0	190	11	.2	17	679	1.0	80	250	220
155-080-19CCB1	28	7/02/75	3,000	7.2	8.5	800	310	190	79	320	46	4.9	8.9	594	0	870	120	.4	15	1,970	3.9	470	20	80
158-078-13DDD2	77	10/28/76	800	8.2	7.0	270	0	75	20	73	37	1.9	5.2	467	0	31	12	.1	24	478	1.0	420	1,300	240
159-078-21ABA	143	6/07/76	2,600	8.2	--	47	0	9.9	5.5	520	96	33	4.3	790	0	13	370	.5	28	1,370	1.0	1,300	100	10
159-078-21BAB1	83	6/07/76	1,810	8.1	--	95	0	25	7.9	390	84	17	4.8	734	0	54	210	.6	28	1,070	1.0	1,000	40	60
159-078-22BCB	59	6/07/76	5,400	7.6	--	2,400	2,000	570	240	380	26	3.4	13	465	0	2,500	220	.2	26	4,580	1.0	400	150	2,800
159-078-22BCD3	63	6/15/51	1,720	--	--	630	--	48	120	160	35	--	3.5	264	18	380	190	.4	26	1,140	61	--	480	--
159-078-22BCD3	63	7/10/75	1,750	7.6	10.0	160	0	46	11	370	83	13	4.7	738	0	130	180	.5	19	1,180	2.5	830	20	80
159-080-15DDD	101	7/03/75	2,800	7.3	9.0	530	120	140	44	440	64	8.3	8.6	501	0	550	400	.3	16	1,840	1.0	870	3,200	220

TABLE 5.--Chemical analyses of water from streams during low flow

LOCATION	DISCHARGE (ft^3/s)	DATE OF SAMPLE	SPECIFIC CONDUCTANCE (umho/cm @ 25°C)	pH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (Ca,Mg) (mg/L)	NON-CARBONATE HARDNESS (mg/L)	DISSOLVED CALCIUM (Ca) (mg/L)	DISSOLVED MAGNESIUM (Mg) (mg/L)	DISSOLVED SODIUM (Na) (mg/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (mg/L)	BICARBONATE (HCO_3) (mg/L)	CARBONATE (CO_3) (mg/L)	DISSOLVED SULFATE (SO_4) (mg/L)	DISSOLVED CHLORIDE (Cl) (mg/L)	DISSOLVED FLUORIDE (F) (mg/L)	DISSOLVED SILICA (SiO_2) (mg/L)	DISSOLVED SOLIDS (RESIDUE AT 180°C) (mg/L)	DISSOLVED NITRATE (NO_3) (mg/L)	DISSOLVED PHOSPHATE (PO_4) (mg/L)	DISSOLVED BORON (B) (ug/L)	DISSOLVED IRON (Fe) (ug/L)	DISSOLVED MANGANESE (Mn) (ug/L)
SOURIS RIVER FROM VELVA TO NEAR BANTRY																									
153-079-06DD	30	2/08/77	1,080	7.6	0.1	410	59	89	46	100	34	2.2	9.8	428	0	250	25	0.1	18	754	4.3	0.25	250	80	380
153-079-07AA	8.3	11/09/77	1,280	8.6	1.0	400	73	110	30	150	44	3.3	11	368	15	340	46	.5	4.6	895	1.0	.59	240	100	240
153-080-22AAA	30	2/08/77	1,070	7.7	.1	390	55	83	44	98	35	2.2	10	409	0	240	25	.1	18	768	4.4	.20	70	100	260
153-080-22AAA	5.6	11/09/77	1,180	8.4	3.0	370	72	87	37	130	43	2.9	7.1	347	8	300	42	.5	3.0	775	2.5	.66	50	140	180
154-078-11BB	12	11/10/77	1,300	8.4	1.0	410	19	100	39	160	45	3.4	9.0	444	16	320	37	.4	5.9	899	1.0	.55	140	60	80
154-078-11BBC	29	2/08/77	1,150	7.4	.1	430	54	92	49	110	35	2.3	9.6	458	0	250	26	.0	20	789	3.9	.20	180	100	740
154-078-12ABB	37	2/09/77	1,140	7.4	.1	430	54	91	49	110	35	2.3	8.8	459	0	240	29	.0	20	793	4.5	.18	70	100	860
154-078-17CB	32	2/08/77	1,120	7.5	.1	430	50	92	49	110	35	2.3	9.0	463	0	250	28	.1	20	773	4.7	.17	180	80	700
154-078-17CB	11	11/10/77	1,380	8.2	2.0	450	75	97	51	160	43	3.3	11	460	0	370	40	.3	7.7	955	.10	.28	240	--	--
154-078-30CC	10	11/09/77	1,380	8.4	3.0	420	52	85	50	180	47	3.8	11	422	13	370	42	.1	6.2	969	2.0	.53	380	60	120
154-078-30CCD	31	2/08/77	1,150	7.5	.1	420	51	92	46	110	36	2.3	9.2	450	0	250	29	.1	19	783	4.3	.24	210	170	560
155-077-23CC	--	11/11/77	1,210	8.4	2.0	380	0	81	43	150	46	3.4	8.4	425	21	240	46	.1	2.6	808	1.0	.37	330	200	90
155-077-23CDD	33	2/09/77	1,100	7.5	.1	420	52	89	48	100	34	2.1	9.0	449	0	240	25	.0	20	769	3.3	.16	180	150	1,100
156-076-20CD	--	11/11/77	1,300	8.5	.0	360	0	77	41	180	51	4.1	8.9	463	12	260	60	.1	8.8	895	2.0	.28	140	80	120
156-076-20CDC	35	2/09/77	1,140	7.5	.1	430	52	92	49	100	33	2.1	8.2	461	0	230	27	.1	20	768	4.0	.28	210	80	1,600
157-075-19CAD	27	11/11/77	1,200	8.4	.5	380	8	81	43	140	44	3.1	8.4	431	13	240	51	.1	9.8	824	2.0	.20	380	20	140
157-075-19DBB	36	2/10/77	1,090	7.4	.1	410	34	91	44	100	34	2.2	8.0	458	0	230	26	.1	20	755	4.0	.37	180	120	1,800
158-076-14DB	38	2/10/77	1,050	7.3	.0	390	16	89	41	94	34	2.1	7.9	456	0	200	25	.1	22	717	4.2	.49	40	370	2,200
158-076-14DB	26	11/11/77	1,120	8.5	.0	360	0	90	33	130	43	3.0	7.7	410	14	220	45	.5	8.3	718	1.0	.17	330	40	160
WINTERING RIVER NEAR KARLSRUHE																									
154-077-04BDB	.74	2/09/77	650	7.3	.1	310	0	76	29	35	20	.9	2.4	412	0	34	9.2	.1	25	431	2.5	.00	70	80	1,000
154-077-10DDA	2.6	11/10/77	645	8.2	7.0	280	0	66	29	37	22	1.0	3.7	390	0	48	7.9	.1	15	390	--	.02	120	--	--

TABLE 6.—Particle-size distribution graphs



PERCENT OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004-0.625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
	24.1	18.3	19.1	36.1	2.3	0.12	0	0	0	0	0	0

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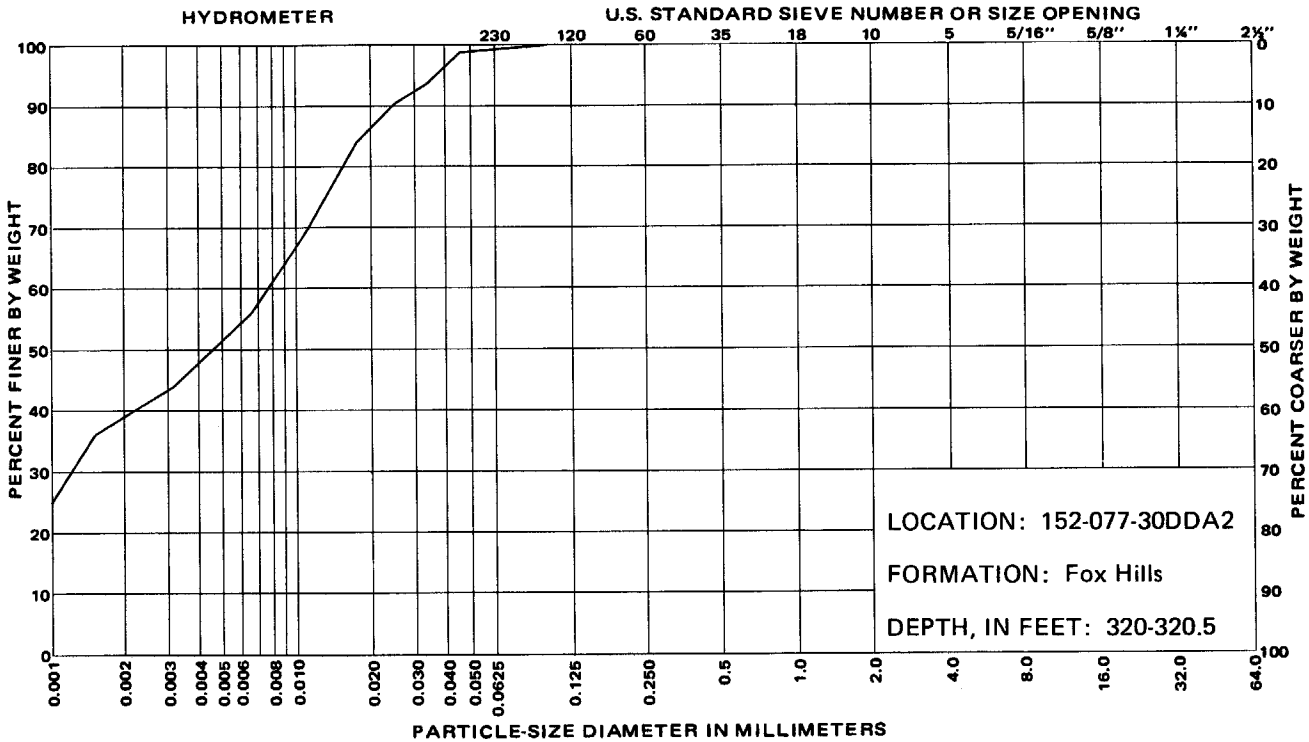
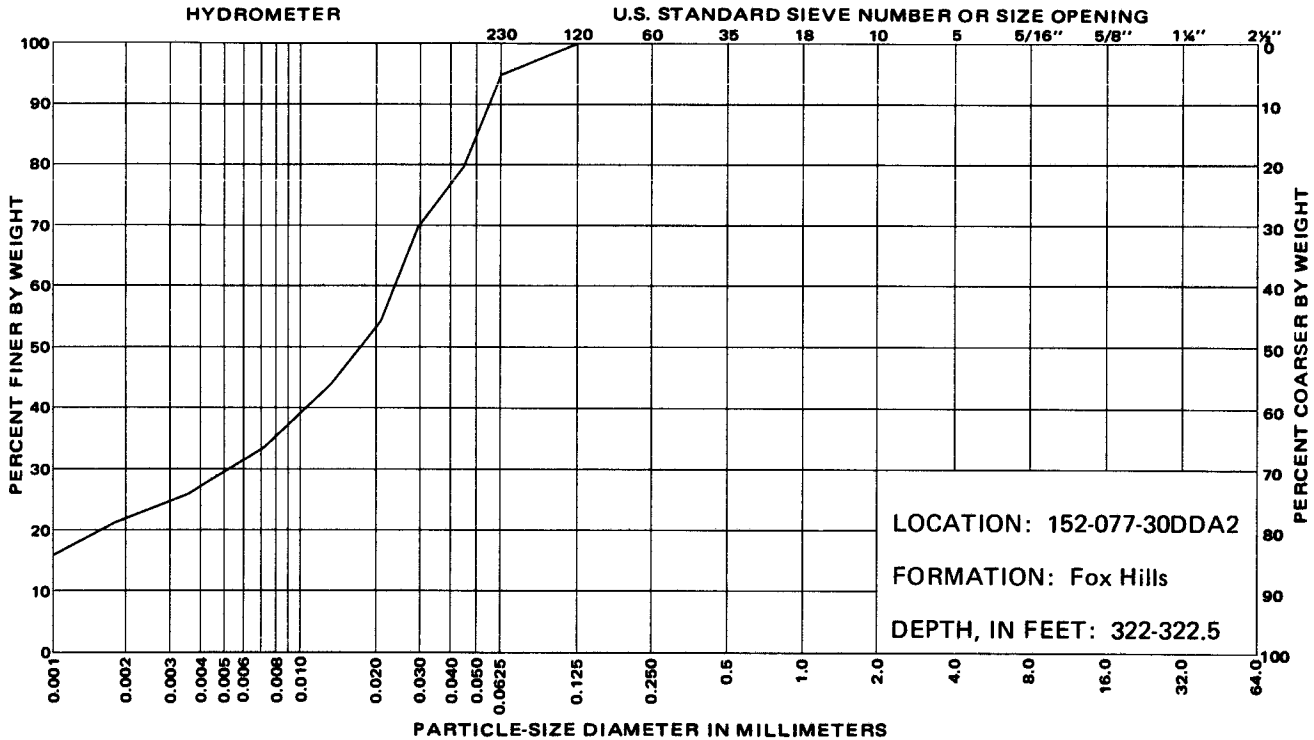
HYDROLOGIC LABORATORY, DENVER, COLO.



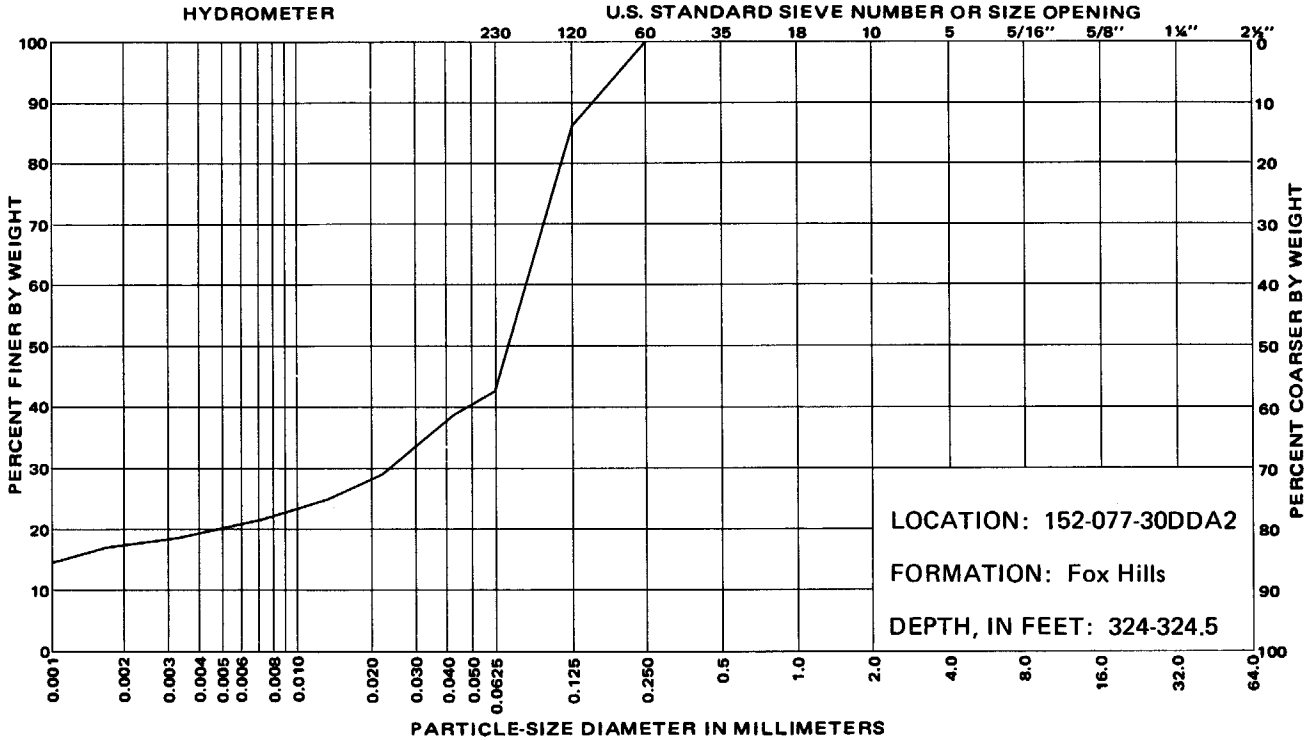
PERCENT OF SIZE

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004-0.625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
47.1	52.4	0.3	0.14	0.02	0.06	0	0	0	0	0	0

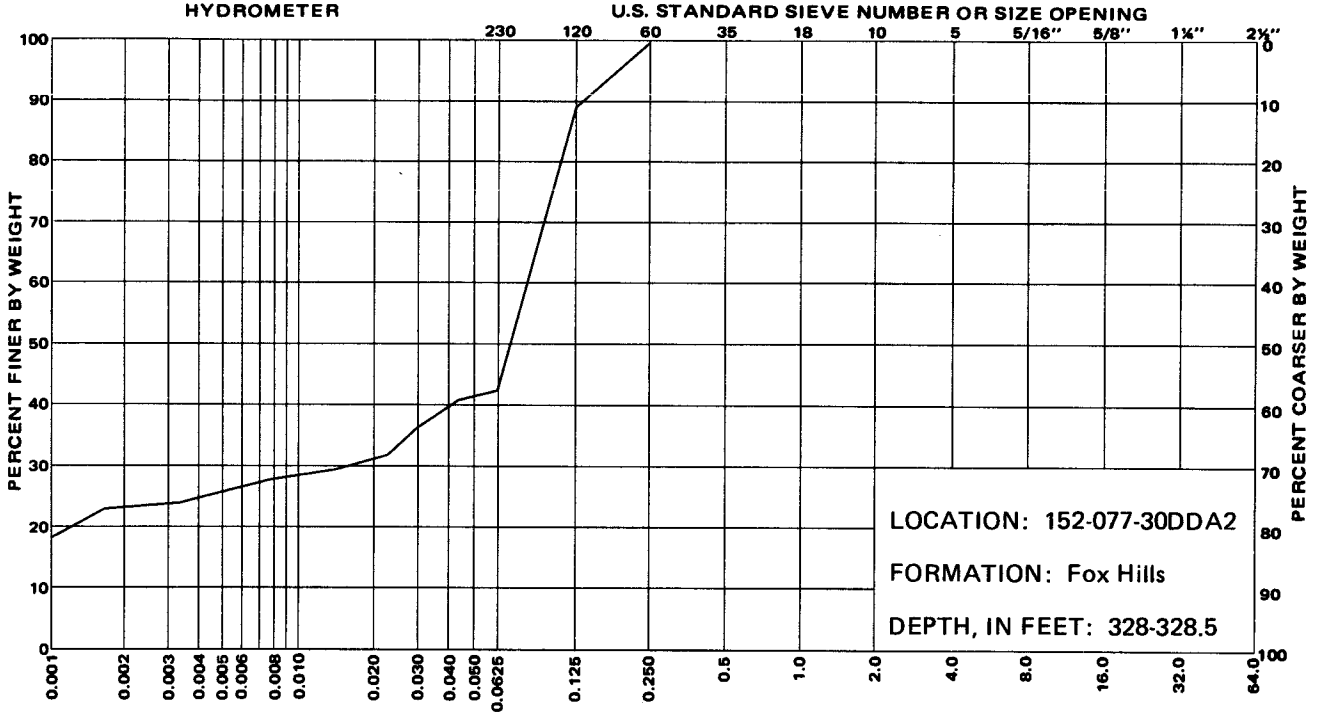


PERCENT OF SIZE

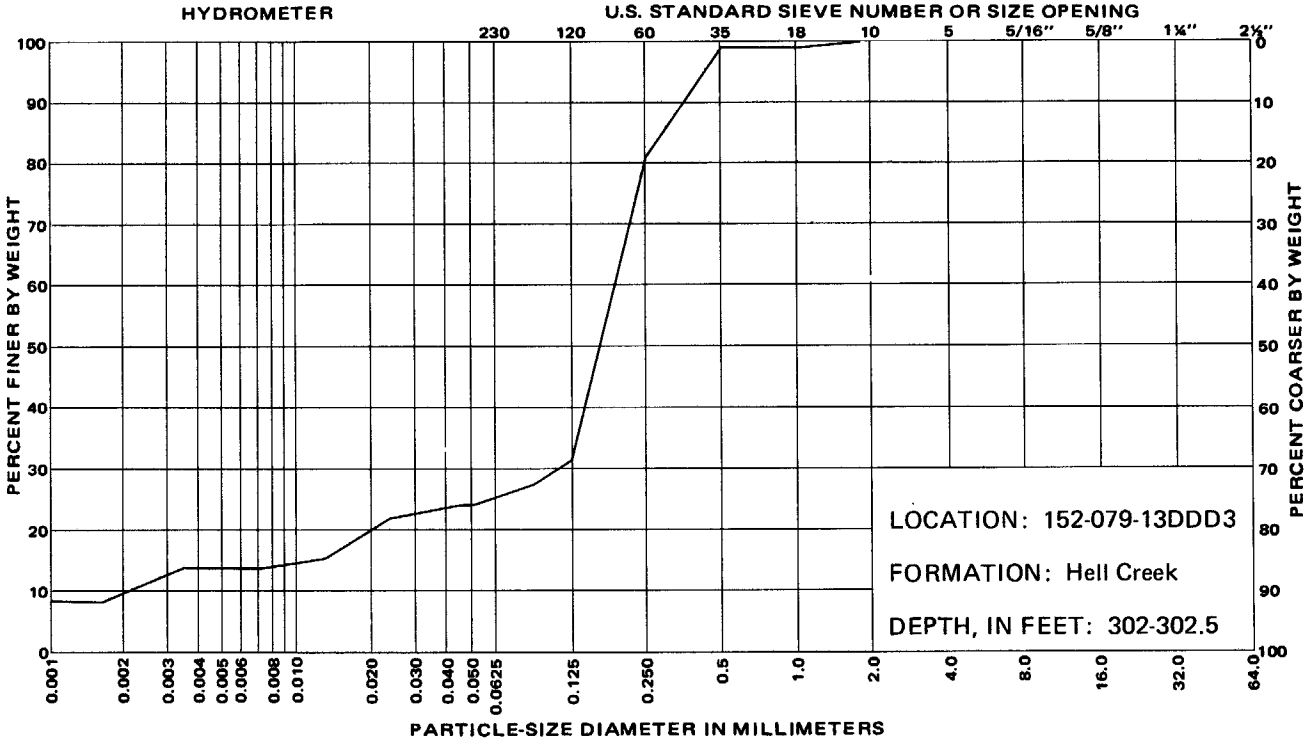
CLAY SIZES < 0.004 mm	SILT SIZES 0.004-0.625 mm	SAND SIZES					GRAVEL SIZES				
		V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
26.7	68.8	4.3	0.12	0.04	0.04	0.02	0	0	0	0	0



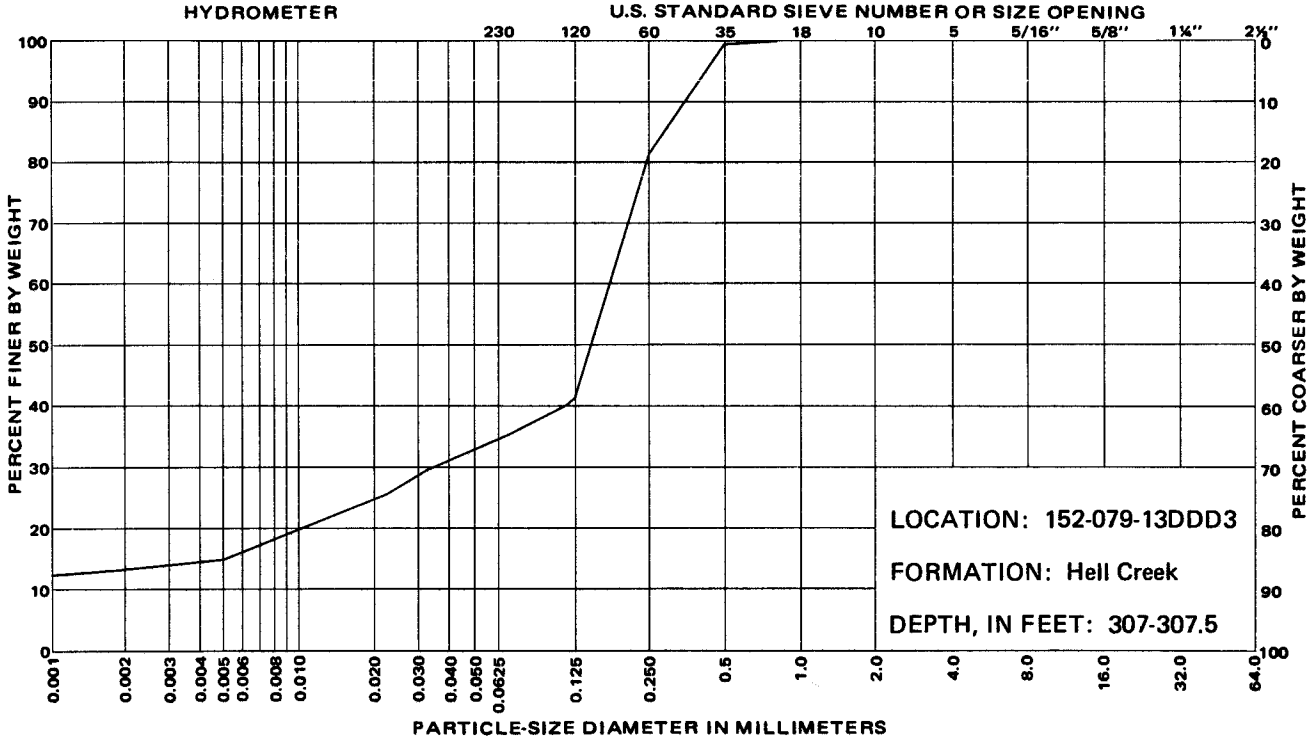
PERCENT OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004-0.625 mm	SAND SIZES					GRAVEL SIZES				
			V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
	19.8	23.7	42.4	14.1	0.10	0.02	0	0	0	0	0	0



PERCENT OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004-0.625 mm	SAND SIZES					GRAVEL SIZES				
			V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
	24.0	18.9	45.8	11.0	0.2	0.08	0	0	0	0	0	0

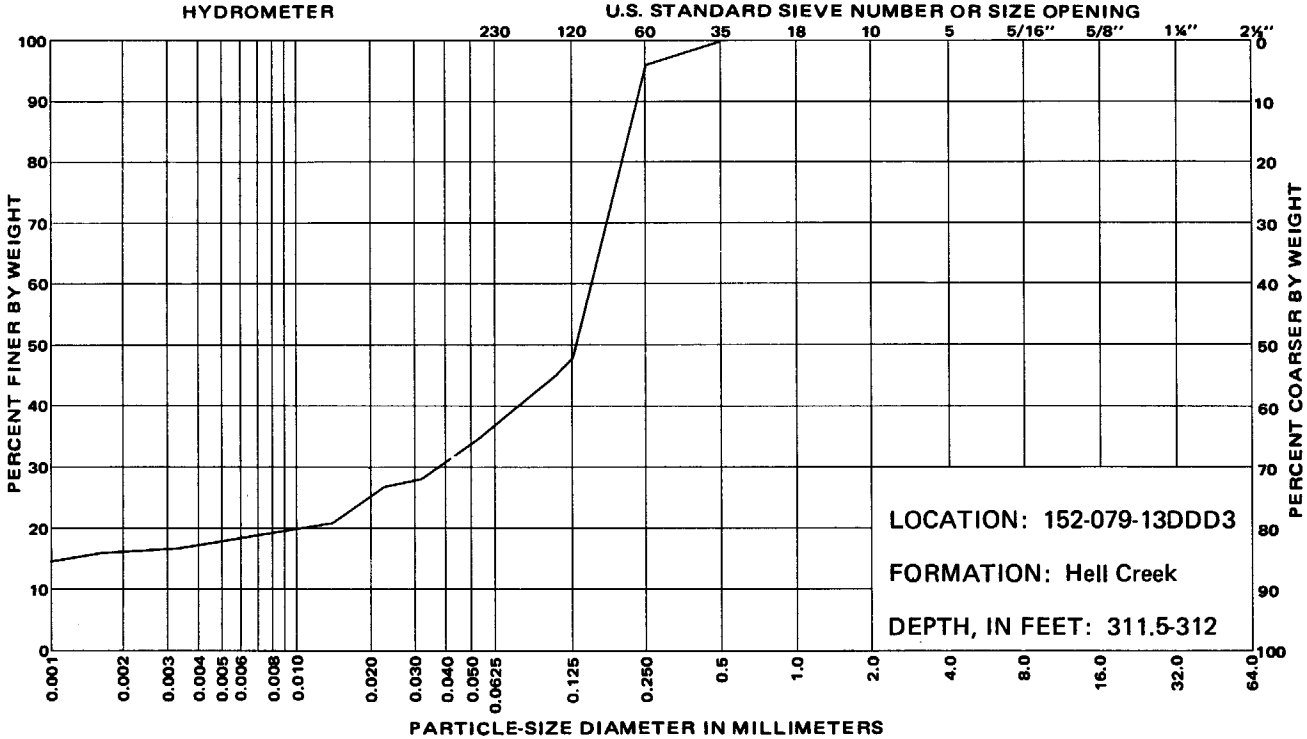


PERCENT OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004-0.625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
	13.6	9.6	9.3	48.9	18.4	0.1	0.02	0	0	0	0	0

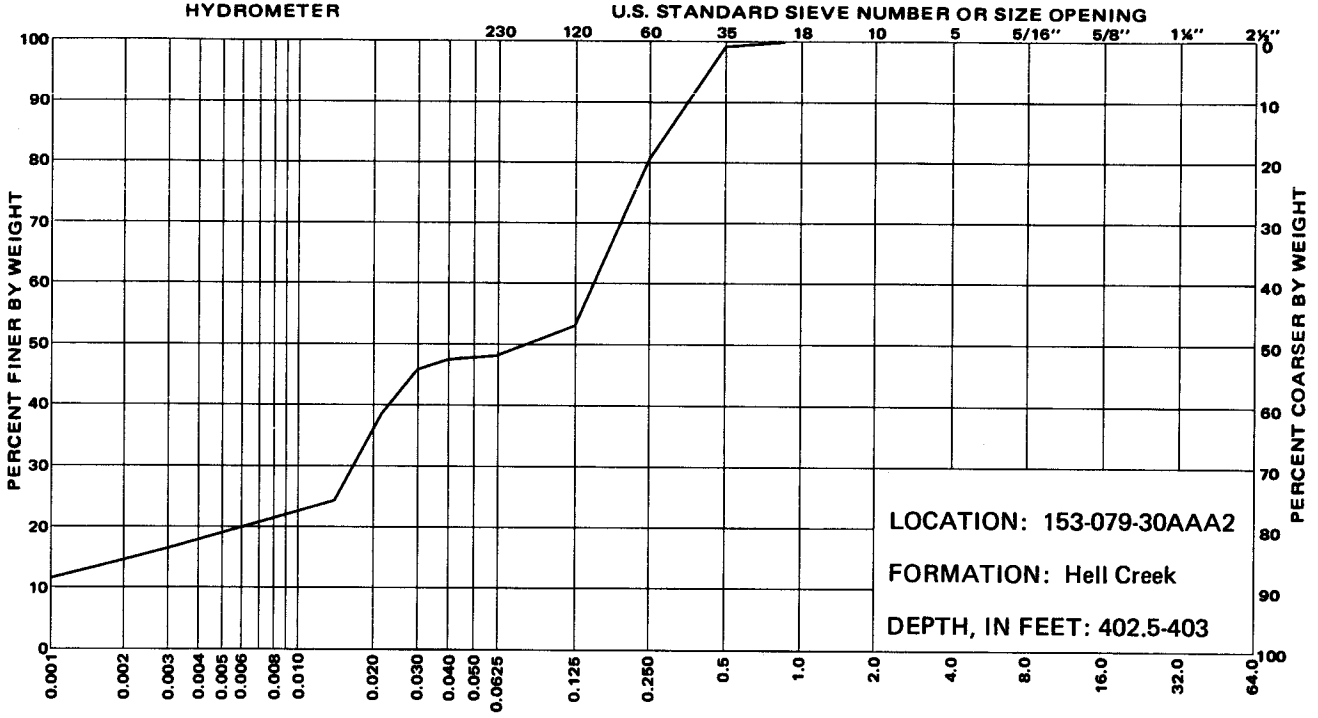


PERCENT OF SIZE

CLAY SIZES < 0.004 mm	SILT SIZES 0.004-0.625 mm	SAND SIZES					GRAVEL SIZES				
		V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
15.5	15.3	10.9	39.8	18.4	0.04	0	0	0	0	0	0

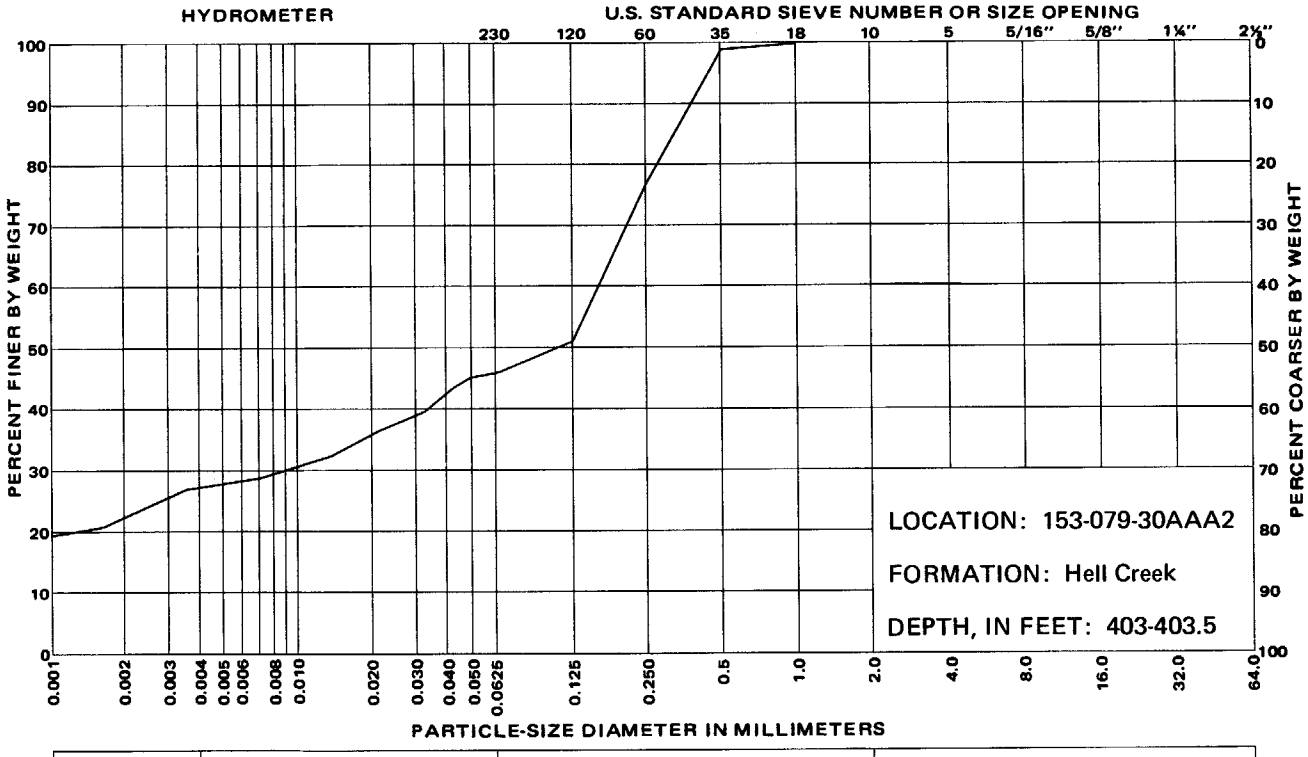


PERCENT OF SIZE	CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
	< 0.004 mm	0.004-0.625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
	17.4	10.1	20.6	48.1	3.8	0.1	0	0	0	0	0	0

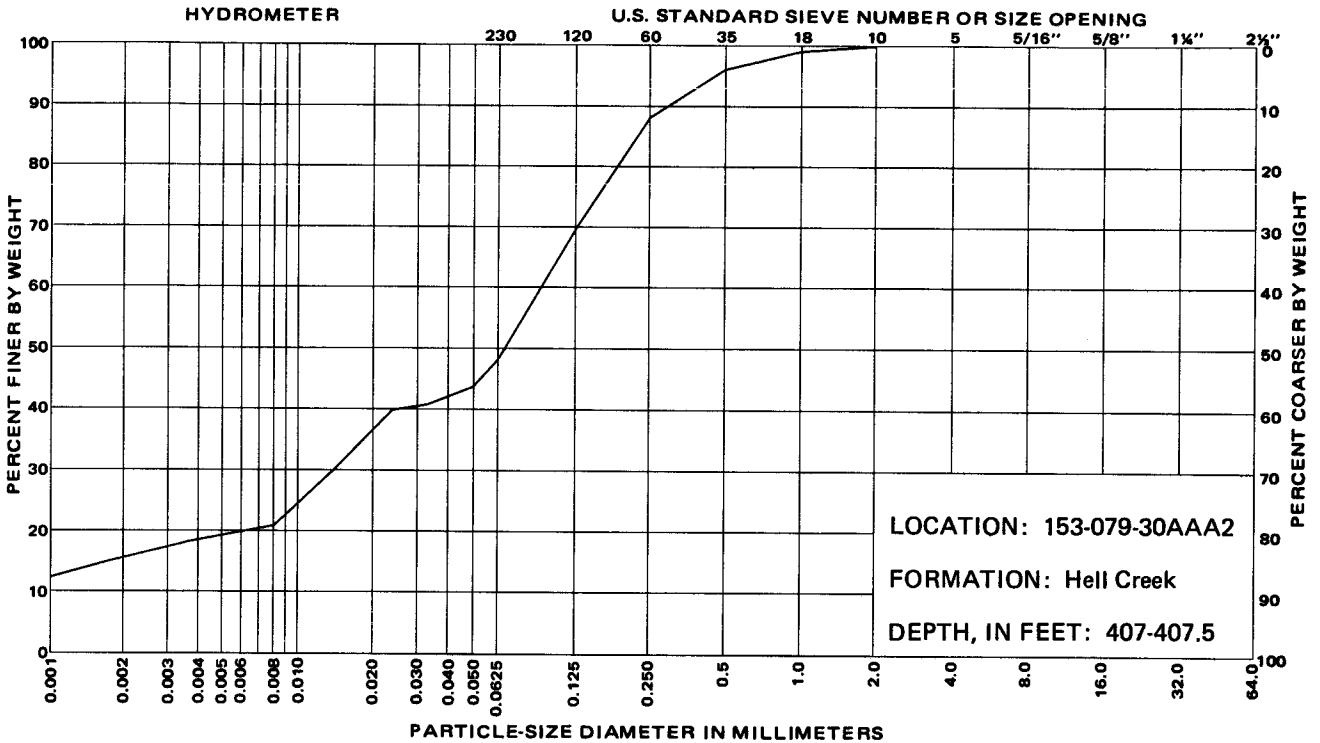


PERCENT OF SIZE

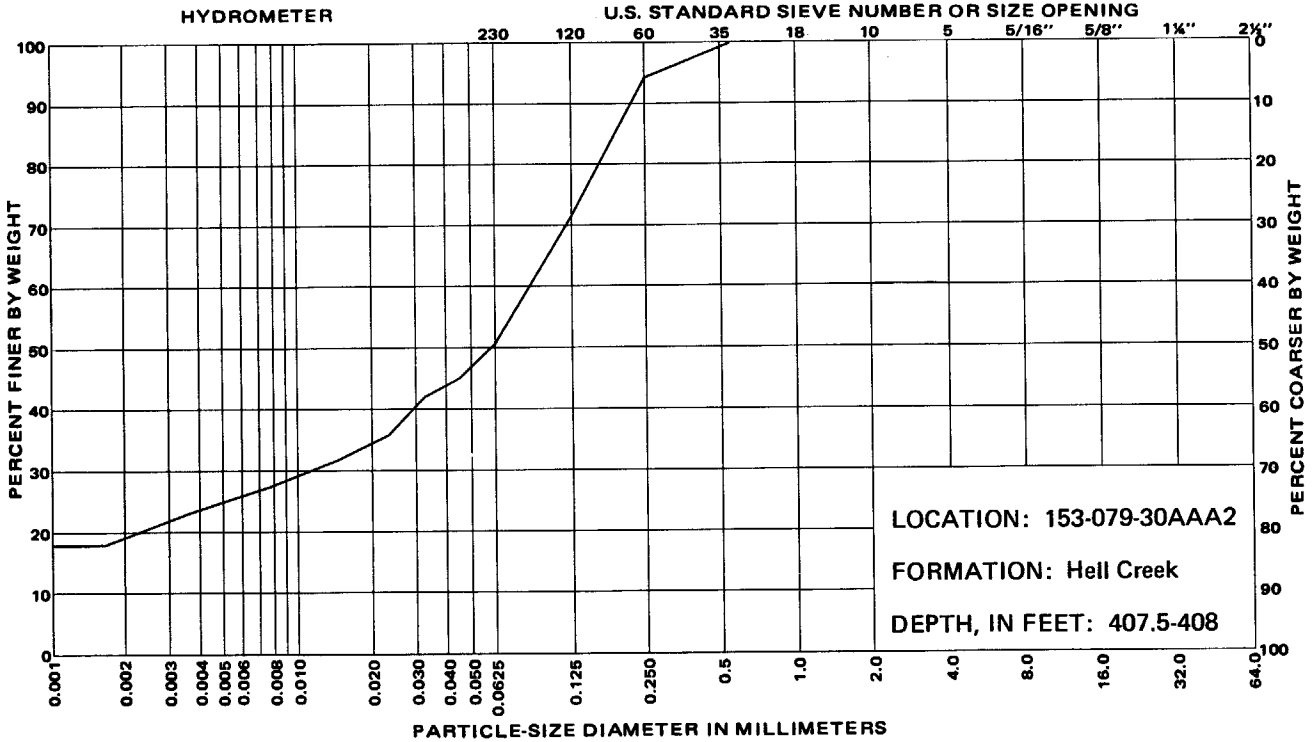
CLAY SIZES < 0.004 mm	SILT SIZES 0.004-0.625 mm	SAND SIZES					GRAVEL SIZES				
		V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
17.6	30.3	5.2	27.7	18.8	0.4	0	0	0	0	0	0



PERCENT OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004-0.625 mm	SAND SIZES					GRAVEL SIZES				
			V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
	26.9	19.2	4.9	26.6	21.3	1.1	0	0	0	0	0	0

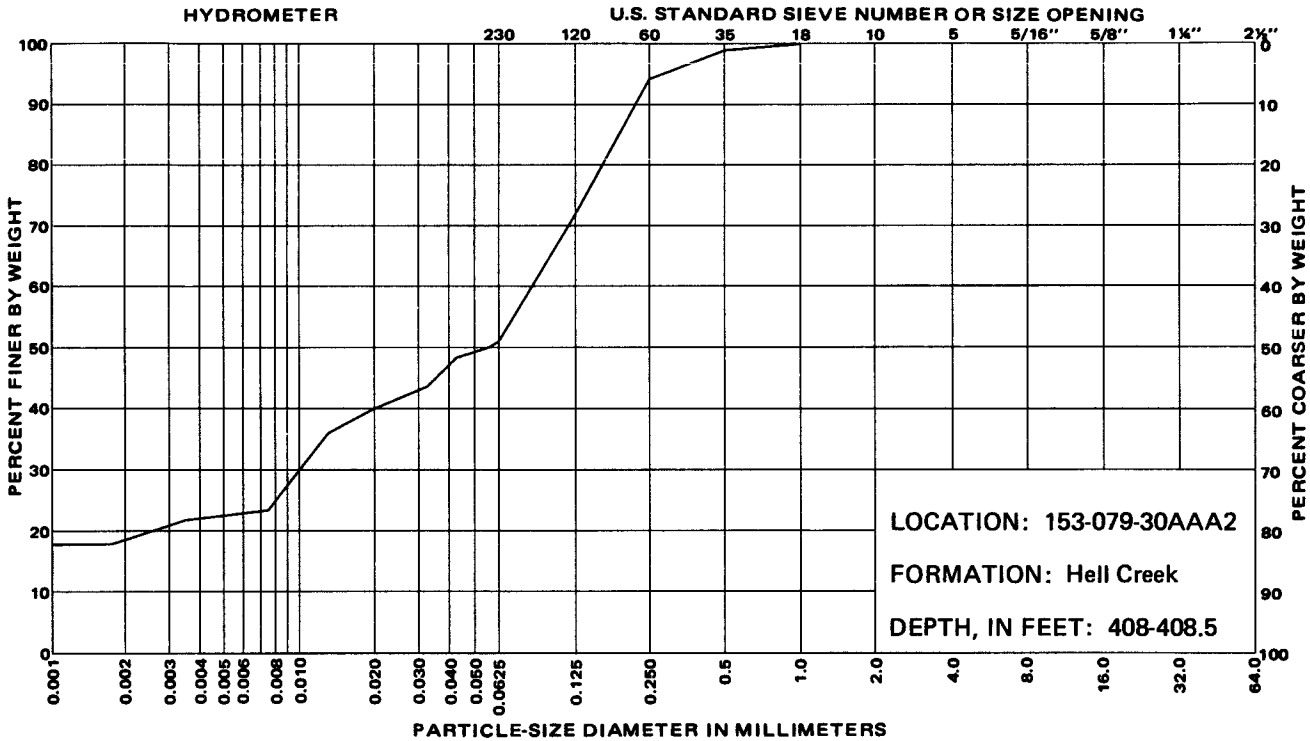


PERCENT OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004-0.625 mm	SAND SIZES					GRAVEL SIZES				
			V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
	18.5	29.6	20.9	19.1	8.1	3.3	0.5	0	0	0	0	0



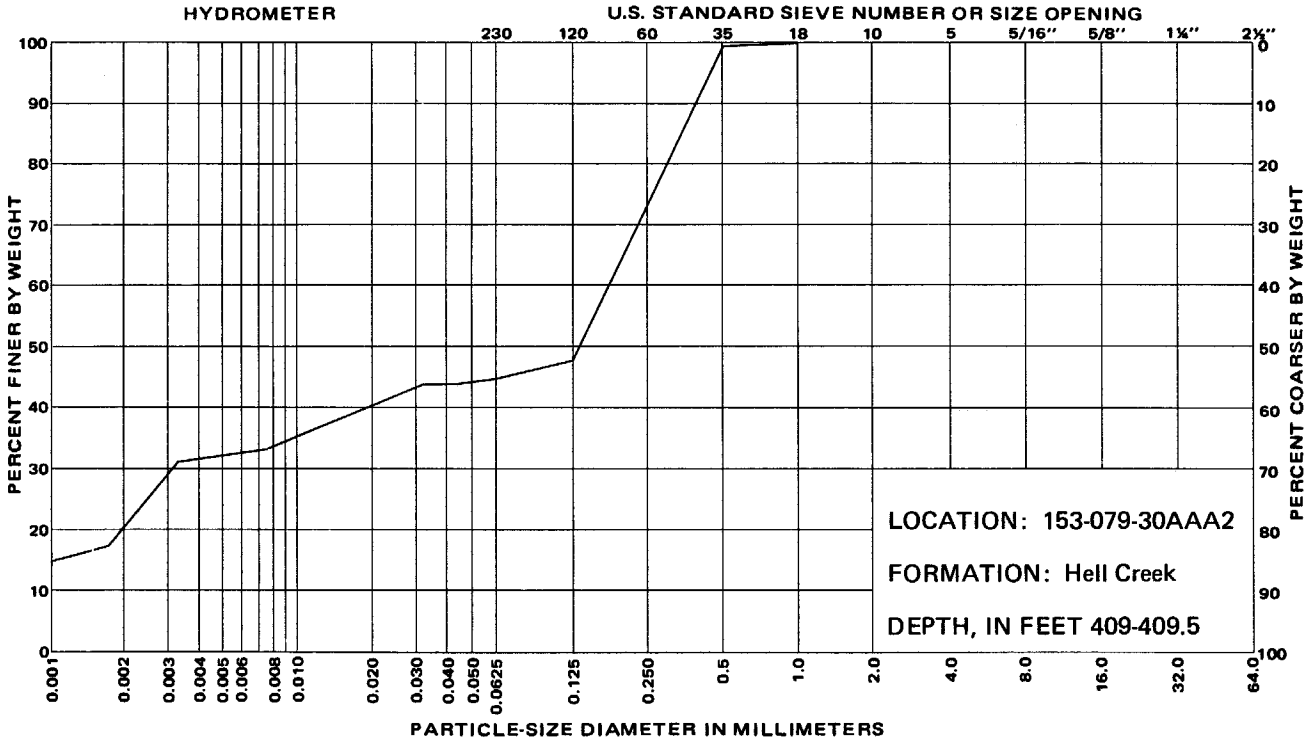
PERCENT OF SIZE

CLAY SIZES < 0.004 mm	SILT SIZES 0.004-0.625 mm	SAND SIZES					GRAVEL SIZES				
		V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
24.4	26.4	21.1	22.4	5.4	0.3	0	0	0	0	0	0



PERCENT OF SIZE

CLAY SIZES	SILT SIZES	SAND SIZES					GRAVEL SIZES				
< 0.004 mm	0.004-0.625 mm	V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
22.0	28.9	21.1	22.4	5.0	0.6	0.04	0	0	0	0	0



PERCENT OF SIZE	CLAY SIZES < 0.004 mm	SILT SIZES 0.004-0.625 mm	SAND SIZES					GRAVEL SIZES				
			V. fine .0625-.125	Fine .125-.25	Medium .25-.5	Coarse .5-1	V. coarse 1-2	V. fine 2-4	Fine 4-8	Medium 8-16	Coarse 16-32	V. coarse 32-64
	31.6	13.2	3.1	24.9	26.6	0.4	0.2	0	0	0	0	0

TABLE 7.--Heavy-mineral content of core samples[1/]
(Percent heavy minerals per 300-grain samples)

Location	152-077-30DDA2		152-079-13DDD3		153-079-30AAA2		
Principal aquifer	Fox Hills Sandstone		Hell Creek Formation		Hell Creek Formation		
Depth, in feet	320-320.5	328-328.5	302-302.5	311.5-312	402.5-403	407-407.5	409-409.5
Weight heavy minerals (percent, >230<60)	.21	.48	.94	.64	.31	.22	.25
			Number frequency per 100 grains				
Pyrite	27	--	--	--	--	--	--
Magnetite	3	5	9	11	57	43	36
Limonite	5	20	43	39	--	27	27
Carbonate	--	--	1	--	--	--	--
Muscovite	11	--	--	--	--	--	--
Biotite	36	39	21	9	3	1	16
Hornblende	8	12	8	3	1	1	--
Anthophyllite	--	--	--	--	<1	--	--
Tourmaline	--	5	1	2	<1	4	2
Zoisite	<1	9	3	10	--	--	--
Garnet	3	1	5	11	23	13	13
Zircon	2	1	--	2	11	8	3
Sphene	--	1	--	--	--	--	--
Epidote	3	6	8	11	3	1	2
Unidentified	1	1	1	2	2	2	1

[1/] Analyses by U.S. Geological Survey Hydrologic Laboratory, Lakewood, Colorado.

TABLE 8.--Hydraulic parameters and statistical characteristics of grain-size analyses[1/]

Location	Depth in feet	Specific gravity of solids (gm/cc)	Dry unit weight (gm/cc)	Total porosity (percent)	Carbonate content weight (percent) CO_3	Carbonate content weight (percent) $CaCO_3$ Equivalent	Median size (mm)	Sorting coefficient	Skewness
				FOX HILLS FORMATION					
152-077-30DDA2	320-320.5	2.83	1.60	43.5	0.85	1.42	0.005	--	--
	322-322.5	2.67	1.06	60.3	--	--	.02	3.3	0.4
	324-324.5	2.80	1.40	50.0	--	--	.07	2.8	.29
	328-328.5	2.72	1.15	57.7	.13	.22	.07	4.6	.10
				HELL CREEK FORMATION					
151-076-07DDC3	206.5-207	2.73	--	--	--	--	.09	5.9	.11
152-079-13DDD3	302-302.5	2.73	1.33	51.3	.51	.85	.17	1.8	.6
	307-307.5	2.78	1.57	43.5	--	--	.15	3.3	.2
	311.5-312	2.75	1.25	54.5	.085	.14	.13	2.1	.5
153-079-30AAA2	402.5-403	2.74	1.85	32.5	.17	.28	.09	3.9	.4
	403-403.5	2.75	1.68	38.9	--	--	.11	8.9	.06
	407-407.5	2.49	1.67	32.9	0	0	.07	3.8	.41
	407.5-408	2.64	1.73	34.5	--	--	.06	5.6	.18
	408-408.5	2.67	1.75	34.4	--	--	.06	4.1	.34
	409-409.5	2.74	1.69	38.3	0	0	.14	10.1	.04

[1/] Analyses by U.S. Geological Survey Hydrologic Laboratory, Lakewood, Colorado.