SUPPLEMENTAL SAMPLE LOGS OF TEST HOLES BROWN COUNTY, KANSAS

by

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1-15-17aaa.--Sample log of test hole in NE cor. sec. 17, T. 1 S., R. 15 E., 200 feet south and 8 feet west of center of crossroad; augered August 23, 1960. Altitude of land surface, 1104.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan and Recent Stages		
Colluvium and slope wash		
Silt, gray brown	4	4
Silt, brown	5	9
Clay, silty brown	3	12
PERMIAN		
Lower Permian Series		
Council Grove Group		
Shale, weathered, tan	1	13
Limestone, hard, white	0.2	13.2

1-15-17dad.--Sample log of test hole in SE NE SE sec. 17, T. 1 S., R. 15 E., on west road shoulder 100 feet north of bridge; augered August 23, 1960. Altitude of land surface, 1058.0 feet; depth to water, 9.2 feet.

	Thickness, feet	Depth feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray brown	10	10
Silt, brown	7	17
Silt, brown and fine to coarse sand and gravel	5	22
PERMIAN		
Lower Permian Series		
Council Grove Group		
Shale, gray	1	23

1-15-24bbb.--Sample log of test hole in NW cor. sec. 24, T. 1 S., R. 15 E., 150 feet east and 8 feet south of center of crossroad; augered August 23, 1960. Altitude of land surface, 1074.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown	6	6
Clay, tan-gray	2	8
Clay, gray; contains gravel	1	9
Silt, compact, gray	2	11
Clay, gray; contains much gravel	21	32
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, clayey, gray	3	35

1-15-26add.--Sample log of test hole in SE SE NE sec. 26, T. 1 S., R. 15 E., 300 feet north of ½ mile line in west road ditch; augered August 23, 1960. Altitude of land surface, 1135.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, light brown	10	10
Clay, tan	3	13
Clay, tan brown, some gray clay	3	16
PERMIAN		
Lower Permian Series		
Council Grove Group		
Granola Limestone		
Limestone (Neva), hard, gray white	.2	16.2

1-15-32aad.--Sample log of test hole in SE NE NE sec. 32, T. 1 S., R. 15 E., 800 feet south and 8 feet west of road crossing; augered August 23, 1960. Altitude of land surface, 1238.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, red brown	7	7
Silt, clayey, brown	5	12
PERMIAN		
Lower Permian Series		
Council Grove Group		
Shale, gray	0.2	12.2

1-15-32dad.--Sample log of test hole in SE NE SE sec. 32, T. 1 S., R. 15 E., on west road shoulder 70 feet south of railroad; augered August 23, 1960. Altitude of land surface, 1252.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray brown	3	3
Silt, brown	10	13
PERMIAN		
Lower Permian Series		
Council Grove Group		
Shale, gray	0.2	13.2

1-15-36bbc.--Sample log of test hole in SW NW NW sec. 36, T. 1 S., R. 15 E., on trail leading east just south of west grain bin; augered August 24, 1960. Altitude of land surface, 1095.0 feet; depth to water, 9.2 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, brown	5	5
Clay, dark gray	2	7
Silt, red brown	3	10
Silt, sandy, buff	5	15
Silt, buff; contains thin zones of sand and gravel	13	28
PERMIAN		
Lower Permian Series		
Council Grove Group		
Red Eagle Limestone		
Shale, dark gray to black	5	33

1-15-36bcc.—Sample log of test hole in SW SW NW sec. 36, T. 1 S., R. 15 E., on east road shoulder at ½ mile line; augered August 24, 1960. Altitude of land surface, 1151.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, black grading to brown	5	5
Silt, brown	15	20
Clay, brown, contains gravel and cobbles	6	26
PERMIAN		
Lower Permian Series		
Council Grove Group		
Eskridge Shale		
Shale and limestone, gray and white	2	28

1-15-36ccc.--Sample log of test hole in SW cor. sec. 36, T. 1 S., R. 15 E., in triangle formed by road curve; augered August 24, 1960. Altitude of land surface, 1147.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark brown	6	6
Silt, compact, hard, light brown	3	9
Silt, red brown	2	11
Clay, brown	6	17
Silt, clayey, tan	4	21
PERMIAN		
Lower Permian Series		
Council Grove Group		
Eskridge Shale		
Limestone, hard, gray white	0.2	21.2

1-16-11add.—Sample log of test hole in SE SE NE sec. 11, T. 1 S., R. 16 E., in west road ditch at ½ mile line; augered September 5, 1960. Altitude of land surface, 967.0 feet; depth to water, 5.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, red brown, grading to brown	3.5	3.5
Clay, sandy, tan brown	3	6.5
Clay, tan-brown	4	10.5
Clay, brown	4.5	15.0
PERMIAN		
Lower Permian Series		
Admire Group		
Limestone, hard	0.2	15.2

1-16-13bbb.--Sample log of test hole in NE cor. sec. 13, T. 1 S., R. 16 E., 20 feet south and 6 feet east of center of crossroad; augered September 5, 1960. Altitude of land surface, 1002.0 feet; depth to water, 8.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray	3.5	3.5
Silt, clayey, buff	5	8.5
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray, mottled brown	5	13.5
Clay, gray	5	18.5
Silt, sandy, brown	5	23.5
Clay, gray	5	28.5
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, gray	0.5	29.0

1-16-13ccb.--Sample log of test hole in NW SW SW sec. 13, T. 1 S., R. 16 E., on west road shoulder ¼ mile north of section corner; augered September 5, 1960. Altitude of land surface, 990.0 feet; depth to water, 14.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark, brown	2	2
Silt, tan grading to brown	2	4
Silt, clayey, dark brown	4	8
Silt, dark brown	4	12
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, very clayey, light brown	4	16
Clay, sandy, tan	2	18
Sand, fine to coarse, silty tan	4	22
Sand, fine to medium, very silty tan	7	29
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, gray	4	33

1-16-16bcb.--Sample log of test hole in NW SW NW sec. 16, T. 1 S., R. 16 E., in east road ditch at top of hill 200 feet north of farm entrance; augered September 2, 1960. Altitude of land surface, 1060.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	11	11
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, buff; contains some coarse gravel	7	18
Silt, sandy, buff	4	22
PERMIAM		
Lower Permiam Series		
Admire Group		
Janesville Shale		
Shale, gray-green, grading to black	3	25

1-16-28ccc.--Sample log of test hole in SW corn. sec. 28, T. 1 S., R. 16 E., 50 feet east and 40 feet north of center of crossroad; augered September 2, 1960. Altitude of land surface, 1074.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray and brown	5	5
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray and gray brown	3	8
Silt, brown	5	13
Silt, very clayey, tan	5	18
Clay, tan grading to buff	3	21
PERMIAN		
Lower Permian Series		
Admire Group		
Janesville Shale		
Shale, gray brown	2	23

1-16-33ccc.--Sample log of test hole in SW cor. sec. 33, T. 1 S., R. 16 E., 60' north of bridge in field entrance to east; augered September 2, 1960. Altitude of land surface, 992.0 feet; depth to water, 9.9 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray	6	6
Silt, black, contains fine gravel in lower part	11	17
PERMIAN		
Lower Permian Series		
Admire Group		
Onaga Shale		
Shale, gray	0.5	17.5

1-16-36ccb.—Sample log of test hole in NW SW SW sec. 36, T. 1 S., R. 16 E., 1/4 mile north of sec. cor. on west road shoulder at fence line; augered September 6, 1960. Altitude of land surface, 982.0 feet; depth to water, 14.5 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	3.5	3.5
Silt, clayey, dark brown	5	8.5
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, red brown	10	18.5
Clay, light brown	5	23.5
Clay, very sandy, dark brown	5	28.5
Silt, tan, contains fine tocoarse sand	10	38.5
Silt, tan, much sand and gravel, fine to coarse	20	58.5

1-17-2aaa.--Sample log of test hole in NE cor. sec. 2, T. 1 S., R. 17 E., 25 feet south of road in a driveway; augered September 19, 1960. Altitude of land surface, 921.0 feet; depth to water, 35.4 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, red brown	5	5
Silt, brown	30	35
Silt, light brown and a little very fine sand	10	45
Silt, light brown	14	59
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, reddish brown	1	60.0

1-17-4bbb.—Sample log of test hole in NW cor. sec. 4, T. 1 S., R. 17 E., in triangle at "T" road; augered October 19, 1960. Altitude of land surface, 1017.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	6	6
Silt, brown	9	15
Silt, light brown	6	21
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt and clay, tan-brown; contains fine to coarse gravel	5	26
Silt and clay, tan and some fine gravel	7	33
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard, gray	0.2	33.2

1-17-8ddd.--Sample log of test hole in SE cor. sec. 8, T. 1 S., R. 17 E., 30 feet west and 10 feet north of center of crossroad; augered October 19, 1960. Altitude of land surface, 1051.0 feet; depth to water, 26.2 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	5	5
Silt, light brown	12	17
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay and silt, gray and brown	4	21
Silt, tan-brown; contains streaks of fine sand	5	26
Silt, tan-brown and fine to coarse sand and gravel and cobbles	14	40
Silt, light tan; contains fine to coarse sand and fine to medium gravel	20	60

1-17-11aaa.--Sample log of test hole in NE corner sec. 11, T. 1 S., R. 17 E., 30 feet south and 6 feet west of center of crossroad; augered September 16, 1960. Altitude of land surface, 907.0 feet; depth to water, 15.7 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	6	6
Silt, brown	16	22
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard, gray	0.2	22.2

1-17-16ccc.--Sample log of test hole in SW cor. sec. 16, T. 1 S., R. 17 E., 50 feet east and 8 feet north of center of crossroad; augered October 19, 1960. Altitude of land surface, 1034.0 feet; depth to water, 31.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, clayey, dark gray-brown	5	5
Clay, dark gray	7	12
Silt, light brown; contains some fine sand	3	15
Clay, gray and tan; contains fine to coarse gravel	6	21
Clay, brown; cobbles at 27 feet	10	31
Silt, brown	6	37
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, blue-gray	3	40

1-17-23aab.--Sample log of test hole in NW NE NE sec. 23, T. 1 S., R. 17 E., 600 feet west of section corner between two bridges; augered September 16, 1960. Altitude of land surface, 925.0 feet; depth to water, 10.4 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark brown	3	3
Silt, black	4	7
Silt, soft, dark brown	13	20
Silt, gray	15	35
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	0.2	35.2

1-17-23add.—Sample log of test hole in SE SE NE sec. 23, T. 1 S., R. 17 E., on west road shoulder 100 feet north of a bridge; augered September 16, 1960. Altitude of land surface, 935.0 feet; depth to water, 10.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, black	10	10
Silt, gray and some fine sand	12	22
Gravel, fine to coarse, very silty gray	1	23
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard, gray	0.5	23.5

1-17-26ddd.--Sample log of test hole in SE corner sec. 26, T. 1 S., R. 17 E., 50 feet north and 8 feet west of center of road crossing; augered September 16, 1960. Altitude of land surface, 1046.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, black	6	6
Silt, dark brown	2	8
Silt, brown	3	11
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt and sand, fine	8	19
Sand, fine to coarse and some fine gravel	4	23
Silt, tan, sandy; interbedded clay streaks	2	25
Silt, tan; some fine gravel	9	34
Sand and gravel, fine to coarse, and gray clay	3	37
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard, gray	0.2	37.2

1-17-32aaa.—Sample log of test hole in NE corner sec. 32, T. 1 S., R. 17 E., 50 feet east and 8 feet south of center of crossroad; augered October 20, 1960. Altitude of land surface, 1078.0 feet; depth to water, 17.5 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	5	5
Silt, brown	5	10
Silt, tan brown	6	16
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, tan and fine to coarse sand and gravel	3	19
Clay, sandy, tan	3	22
Clay, tan and fine sand	4	26
Clay, light tan	7	33
Clay, tan and fine sand	4	37
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard	0.1	37.1

1-18-2ddd.—Sample log of test hole in SE corner sec. 2, T. 1 S., R. 18 E., on west road shoulder 400 feet north of center of crossroad at culvert; augered September 20, 1960. Altitude of land surface, 1008.0 feet: Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	10	10
Silt, brown	7	17
Silt, light brown	18	35
Silt, brown	15	50
Silt, light brown	10	60

1-18-9abb.--Sample log of test hole in NW NW NE sec. 9, T. 1 S., R. 18 E., 75 feet south and 8 feet east of center of crossroad; augered September 20, 1960. Altitude of land surface, 943.0 feet; depth to water, 25.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	12	12
Silt, brown	4	16
Silt, tan-brown	6	22
Silt, light gray-brown	13	35
Silt, light brown; contains some very fine sand	12	47
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, dark gray	3	50

1-18-16abb. Sample log of test hole in NW NW NE sec. 16, T. 1 S., R. 18 E., 200 feet south of section line on east road shoulder; augered September 20, 1960. Altitude of land surface, 985.0 feet; depth to water, 11.3 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	4	4
Silt, brown	7	11
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, dark red-brown	2	13
Clay, tan-brown; contains some fine to coarse gravel	3	16
Clay, tough, tan	4	20
Clay, very soft, tan	6	26
Gravel, fine to coarse, very silty, brown	2	28
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Silver Lake Shale		
Shale, light gray-green	0.2	28.2

1-18-21abb.--Sample log of test hole in NW NW NE sec. 21, T. 1 S., R. 18 E., on east road shoulder 400 feet south of section line and 100 feet south of a bridge; augered September 20, 1960. Altitude of land surface, 936.0 feet; depth to water, 10.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray	3	3
Silt, dark brown	3	6
Silt, brown	16	22
Gravel, very coarse and boulders; some gravel from shale	1	23

1-18-23dcc.—Sample log of test hole in SW SW SE sec. 23, T. 1 S., R. 18 E., in north ditch 75 feet west of creek; augered October 19, 1960. Altitude of land surface, 973.0 feet; depth to water, 15.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark brown	7	7
Silt, brown	13	20
Silt, clayey, red brown	10	30
Clay, silty, tan brown	8	38
Silt, tan and fine to coarse sand and gravel	3	41
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray-brown	5	46

1-18-24bbb.--Sample log of test hole in NW cor. sec. 24, T. 1 S., R. 18 E., in triangle formed by "T" road; augered October 19, 1960. Altitude of land surface, 1002.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	4	4
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard	.5	4.5

1-18-33bbb.--Sample log of test hole in NW cor. sec. 33, T. 1 S., R. 18 E., 50 feet east and 8 feet south of center of "T" road; augered September 21, 1960. Altitude of land surface, 934.0 feet; depth to water, 4.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray brown	10	10
Silt, gray brown; contains some fine sand	10	20
Silt, dark gray brown; contains some fine sand	16	36
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	1	37

1-18-33cbc.--Sample log of test hole in SW NW SW sec. 33, T. 1 S., R. 18 E., on east road shoulder 100 feet south of a bridge; augered September 21, 1960. Altitude of land surface, 946.0 feet; depth to water, 3.6 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray brown	7	7
Silt, brown	23	30
Silt, dark gray	18	48
Silt, black; contains much sand and gravel fine to coarse	3	51
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	1	52

2-15-1ccc.--Sample log of test hole in SW cor. sec. 1, T. 2 S., R. 15 E., 70 feet north and 10 feet east of center of crossroad; augered August 24, 1960. Altitude of land surface, 1172.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown; contains some fine gravel	3	3
Clay, tough, gray mottled brown	4	7
Silt, red brown; some fine gravel in lower part	6	13
Clay, red brown	5	18
Silt, red brown; contains gravel throughout	3	21
PERMIAN		
Lower Permian Series		
Council Grove Group		
Eskridge Shale		
Limestone, hard, white	0.2	21.2

2-15-5daa.--Sample log of test hole in NE NE SE sec. 5, T. 2 S., R. 15 E., on west road shoulder at ½ mile line; augered August 23, 1960. Altitude of land surface, 1285.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray brown	3	3
Silt, brown	4	7
Silt, red brown	9	16
PERMIAN		
Lower Permian Series		
Council Grove Group		
Shale and weathered limestone, light gray	0.2	16.2

2-15-9ccc.--Sample log of test hole in SW cor. sec. 9, T. 2 S., R. 15 E., 100 feet north and 8 feet east of center of crossroad; augered August 23, 1960. Altitude of land surface, 1263.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	7	7
Clay, tan brown	1	8
Silt, clayey, buff	1	9
PERMIAN		
Lower Permian Series		
Council Grove Group		
Limestone and shale, gray	0.2	9.2

2-15-14dda.--Sample log of test hole in NE SE SE sec. 14, T. 2 S., R. 15 E., on west road shoulder at row of trees just south of house; augered August 24, 1960. Altitude of land surface, 1175.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown	8	8
Silt, red brown; contains gravel and cobbles	5	13
Silt and clay, brown; contains boulders	7	20
PERMIAN		
Lower Permian Series		
Council Grove Group		
Eskridge Shale		
Shale and thin limestone, gray and white	1	21

2-15-16ccc.--Sample log of test hole in SW cor. sec. 16, T. 2 S., R. 15 E., 120 feet north and 10 feet east of center of road crossing; augered August 23, 1960. Altitude of land surface, 1280.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray	3	3
Silt, brown	10	13
Clay, gray	2	15
Silt, brown	3	18
Silt, tan	8	26
PERMIAN		
Lower Permian Series		
Council Grove Group		
Limestone and shale, white	.5	26.5

2-15-20ddd.—Sample log of test hole in SE cor. sec. 20, T. 2 S., R. 15 E., 40 feet north and 10 feet west of center of road crossing; augered August 23, 1960. Altitude of land surface, 1287.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray brown	6	6
Silt, brown	2	8
Silt, clayey, reddish brown	9	17
Silt, brown	1	18
PERMIAN		
Lower Permian Series		
Council Grove Group		
Limestone, hard, white	0.2	18.2

2-15-24ccc.--Sample log of test hole in SW cor. sec. 24, T. 2 S., R. 15 E., on east road shoulder 25 feet north of crossroad; augered August 29, 1960. Altitude of land surface, 1185.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown	3.5	3.5
Silt, brown; contains some fine gravel	5	8.5
Silt, buff and tan; contains some coarse sand	5	13.5
Silt, clayey, tan and gray	5	18.5
Silt, buff	5	23.5
Clay, gray	5	28.5
PERMIAN		
Lower Permian Series		
Council Grove Group		
Eskridge Shale		
Shale, gray	.5	29

2-15-32aaa.--Sample log of test hole in NE cor. sec. 32, T. 2 S., R. 15 E., 350 feet south and 8 feet west of center of road crossing; augered August 22, 1960. Altitude of land surface, 1251.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian deposits		
Silt, gray and brown	5	5
Silt, tan brown	6	11
PERMIAN		
Lower Permian Series		
Council Grove Group		
Limestone, hard, white	0.2	11.2

2-15-35daa.--Sample log of test hole in NE NE SE sec. 35, T. 2S., R. 15 E., on west road shoulder at ½ mile line; augered August 29, 1960. Altitude of land surface, 1188 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, dark brown	3.5	3.5
Clay, silty, red brown	5	8.5
Clay, brown	2	10.5
Clay, gray mottled tan brown	3	13.5
Clay, brown	2	15.5
Silt, clayey, contains fine to coarse sand and fine gravel	3	18.5
PERMIAN		
Lower Permian Series		
Council Grove Group		
Eskridge Shale		
Limestone and shale	1	19.5

2-16-1bcb.—Sample log of test hole in NW SW NW sec. 1, T. 2 S., R. 16 E., on east road shoulder 143 feet south of bridge; augered September 6, 1960. Altitude of land surface, 946.0 feet; depth to water, 11.6 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray brown	3.5	3.5
Silt, clayey, dark brown	35.0	38.5
Clay, gray tan	10	48.5
Gravel, fine to coarse	6.5	55.0
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	1	56

2-16-1ccc.--Sample log of test hole in SW cor. sec. 1, T. 2 S., R. 16 E., on east road shoulder opposite a tree; augered September 6, 1960. Altitude of land surface, 946.0 feet; depth to water, 6.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, clayey, dark brown	8	8
Silt, brown	25.5	33.5
Clay, dark gray	15	48.5
Clay, dark gray; much gravel fine to coarse	5	53.5
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	1	54.5

2-16-9bbb.--Sample log of test hole in NW cor. sec. 9, T. 2 S., R. 16 E., 75 feet west and 8 feet south of center of crossroad; augered September 2, 1960. Altitude of land surface, 1084.0 feet; depth to water, dry.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark gray and brown	5	5
Silt, clayey, brown; contains coarse gravel	7	12
Silt, buff	3	15
PERMIAN		
Lower Permian Series		
Council Grove Group		
Foraker Limestone		
Shale, brown (weathered)	3	18
Limestone, hard, blue gray	0.2	18.2

2-16-12bcb.—Sample log of test hole in NW SW NW sec. 12, T. 2 S., R. 16 E., on east road shoulder at top of small hill; augered September 6, 1960. Altitude of land surface, 980.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan to Recent Stages		
Colluvium		
Silt, clayey, red brown	3.5	3.5
Silt, brown	5	8.5
Silt, buff	11.5	20
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, gray	1	21

2-16-12ccc.—Sample log of test hole in SW cor. sec. 12, T. 2 S., R. 16 E., 30 feet north and 6 feet east of section corner; augered September 6, 1960. Altitude of land surface, 1042.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	3.5	3.5
Silt, clayey, brown grading to light brown	5	8.5
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, silty red brown	5	13.5
Clay, yellow tan	3	16.5
Silt, tan; contains much fine to coarse gravel	2	18.5
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, gray	1.5	20.0

2-16-14dda.—Sample log of test hole in NE SE SE sec. 14, T. 2 S., R. 16 E., on west road shoulder at a tree; augered September 6, 1960. Altitude of land surface, 1025.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown, grading to light brown	5.5	5.5
Silt, clayey, buff	3	8.5
Silt, clayey, reddish tan	5	13.5
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, gray tan	10	23.5
Shale, clayey, brown	5	28.5
Shale and limestone, gray and light gray	10	38.5

2-16-21ccc.--Sample log of test hole in SW cor. sec. 21, T. 2 S., R. 16 E., 70 feet east and 10 feet north of center of road crossing; augered September 1, 1960. Altitude of land surface, 1021.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	3	3
Silt, clayey, tan brown	4	7
Silt, tan	1	8
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Wood Siding Formation		
Limestone, hard	0.2	8.2

2-16-20add.--Sample log of test hole in SE SE NE sec. 20, T. 2 S., R. 16 E.; augered September 1, 1960. Altitude of land surface, 1056.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, clayey, brown	8	8
PERMIAN		
Lower Permian Series		
Admire Group		
Falls City Limestone		
Limestone, hard	0.2	8.2

2-16-25bbb.--Sample log of test hole in NW cor. sec. 25, T. 2 S., R. 16 E., 75 feet south and 6 feet east of section corner; augered September 6, 1960. Altitude of land surface, 1078.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	8.5	8.5
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, very clayey, buff	5	13.5
Clay, tan	5	18.5
Clay, silty, tan	1	19.5
PERMIAN		
Lower Permian Series		
Admire Group		
Limestone, light gray	0.5	20

2-16-29dad.--Sample log of test hole in SE NE SE sec. 29, T. 2 S., R. 16 E., at field entrance 500 feet south of ½ section line; augered September 1, 1960. Altitude of land surface, 1029.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Illinoisan Stage		
Terrace deposits		
Silt, red brown	11	11
Clay, brown	5	16
Silt, brown; contains much fine to coarse gravel	2	18
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Wood Siding Formation		
Limestone, hard, gray	0.2	18.2

2-16-32aad.--Sample log of test hole in SE NE NE sec. 32, T. 2 S., R. 16 E., in driveway leading west 50 feet south of bridge; augered September 1, 1960. Altitude of land surface, 1017.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, brown; contains some gravel	4	4
Silt, brown	9	13
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Wood Siding Formation		
Shale, gray and brown	3	16
Limestone, hard, gray	0.2	16.2

2-16-36cbc.--Sample log of test hole in SW NW SW sec. 36, T. 2 S., R. 16 E., 120 feet north of bridge and on east road shoulder; augered September 7, 1960. Altitude of land surface, 1066.0 feet; depth to water, 8.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark brown	3.5	3.5
Silt, dark brown grading to tan brown	10	13.5
Clay, dark gray	15	28.5
Clay, sandy, gray	15	43.5
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, light tan brown	0.5	44.0

2-17-2aaa.--Sample log of test hole in NE cor. sec. 2, T. 2 S., R. 17 E., 50 feet south and 8 feet west of center of crossroad; augered September 15, 1960. Altitude of land surface, 1072.0 feet; depth to water, 16.7 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	4	4
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, silty and fine sandy, tan brown	2	6
Silt, tan	6	12
Silt, sandy, tan	5	17
Silt, tan, contains fine to coarse gravel	4	21
Sand, fine to coarse and some fine to coarse gravel	7	28
Clay, tough, and interbedded fine to coarse sand and gravel and cobbles	5	33

2-17-2ddd.--Sample log of test hole in SE cor. sec. 2, T. 2 S., R. 17 E., 50 feet north and 3 feet west of center of crossroad; augered September 15, 1960. Altitude of land surface, 1039.0 feet; depth to water, 7.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, black	6	6
Silt, gray green	6	12
Silt, brown	8	20
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, dark gray	5	25
Sand, fine to coarse, very silty; some gravel fine	15	40
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	0.2	40.2

2-17-4ccc.--Sample log of test hole in SW cor. sec. 4, T. 2 S., R. 17 E., 75 feet east and 6 feet north of center of crossroad; augered October 20, 1960. Altitude of land surface, 1072.0 feet; depth to water, 16.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark brown	6	6
Silt, clayey, red brown; contains fine gravel	5	11
Silt, clayey, tan; much fine to coarse sand and gravel	5	16
Clay, buff and tan; contains coarse gravel	10	26
Sand, fine to coarse	14	40
Silt, very sandy, brown; some gravel in streaks	7	47
Sand and gravel, fine to coarse, silty tan	4	51
Clay, dark gray; contains fine to coarse gravel throughout interval	9	60

2-17-9ccc.--Sample log of test hole in SW cor. sec. 9, T. 2 S., R. 17 E., 50 feet east and 8 feet north of center of crossroad; augered October 20, 1960. Altitude of land surface, 1100.0 feet; depth to water, 31.5 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	4	4
Silt, red brown	5	9
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, tan brown and some fine gravel	6	15
Silt, tan and coarse gravel	11	26
Clay, silty, tan brown and fine to coarse sand and gravel	19	45
Silt, clayey and fine to coarse sand and gravel	15	60

2-17-11ddd.--Sample log of test hole in SE cor. sec. 11, T. 2 S., R. 17 E., 75 feet north and 8 feet west of center of crossroad; augered September 15, 1960. Altitude of land surface, 1103.0 feet; depth to water, 37.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian deposits		
Silt, dark brown	3	3
Silt, brown	4	7
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray and brown	5	12
Silt, brown and sand and gravel, fine to coarse	5	17
Silt, tan brown	8	25
Silt, tan brown and fine to coarse gravel and cobbles	10	35
Sand, fine	7	42
Silt, brown	1	43
Sand, fine, and some gravel, fine to coarse, and cobbles	17	60

2-17-13ccc.--Sample log of test hole in SW cor. sec. 13, T. 2 S., R. 17 E., 50 feet east and 8 feet north of center of crossroad; augered September 15, 1960. Altitude of land surface, 1102.0 feet; depth to water, 27.6 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, light brown	7	7
Silt, tan brown	10	17
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray mottled brown	2	19
Silt and clay, buff; contains some fine to coarse gravel	7	26
Silt, very sandy, tan	5	31
Silt, tan; contains lenses of fine to coarse sand and gravel	11	42
Silt, clayey and fine to coarse sand and gravel and cobbles	18	60

2-17-16ccc.--Sample log of test hole in SW cor. sec. 16, T. 2 S., R. 17 E., 75 feet east and 10 feet north of center of crossroad; augered October 20, 1960. Altitude of land surface, 1108.3 feet; depth to water, 16.3 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown and dark gray	6	6
Silt, brown	2	8
Silt, red brown	4	12
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, brown	8	20
Silt, brown and very fine sand	15	35
Sand, very fine and fine, silty, buff	8	43
Clay, silty, tan and gray and fine to coarse sand and gravel	17	60

2-17-26aaa.--Sample log of test hole in NE cor. sec. 26, T. 2 S., R. 17 E., on west road shoulder 100 feet south of center of highway; augered September 15, 1960. Altitude of land surface, 1046.0 feet; Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, black	6	6
Silt, brown	3	9
Silt, gray brown	4	13
Silt, gray	7	20
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Auburn shale		
Shale, soft, blue gray	3	23

2-17-32aaa.--Sample log of test hole in NE cor. sec. 32, T. 2 S., R. 17 E., 150 feet west and 8 feet south of center of crossroad; augered October 21, 1960. Altitude of land surface, 1118.0 feet; depth to water, 12.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, black	5	5
Silt, brown	6	11
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, silty, gray and brown	9	20
Silt and clay, tan gray and fine to coarse sand and gravel	6	26
Clay, silty, tan gray, and fine to coarse sand and gravel, much sand from 50 to 60 feet	34	60

2-17-32ddd.--Sample log of test hole in SE cor. sec. 32, T. 2 S., R. 17 E., 50 feet west and 20 feet north of center of crossroad; augered October 21, 1960. Altitude of land surface, 1055.0 feet; depth to water, 31.4 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown	4	4
Clay, black	3	7
Clay, dark brown	3	10
Clay, silty, tan brown and coarse gravel	6	16
Clay, brown and fine to coarse sand and gravel	5	21
Clay, dark gray; contains fine to coarse sand and gravel	1	22
Silt, dark gray brown; much very fine sand	6	28
Clay, dark gray	4	32
Clay, dark gray brown and fine to coarse gravel	9	41
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard	0.2	41.2

2-17-35dda.--Sample log of test hole in NE SE SE sec. 35, T. 2 S., R. 17 E., on west road shoulder 100 feet south of a bridge; augered September 15, 1960. Altitude of land surface, 983.0 feet; depth to water, 11.9 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray	8	8
Silt, gray brown	3	11
Silt, gray	6	17
Silt, brown	13	30
Silt, very soft, gray	18	48
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Scranton Shale		
Shale (weathered), dark gray	2	50

2-18-4bbc.--Sample log of test hole in SW NW NW sec. 4, T. 2 S., R. 18 E., in east road ditch 600 feet south of section corner; augered September 21, 1960. Altitude of land surface, 988 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, tan brown	15	15
Silt, tan	11	26
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, tan brown	1	27
Silt, clayey, light tan	5	32
Clay, brown contains some fine gravel	5	37
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	1	38

2-18-8ddd.—Sample log of test hole in SE cor. sec. 8, T. 2 S., R. 18 E., in west road ditch 75 feet north of center of crossroad; augered September 21, 1960. Altitude of land surface, 1017.0 feet; depth to water, 37.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	7	7
Silt, light brown	5	12
Silt, dark red brown	6	18
Silt, brown	27	45
Lower Pleistocene-Kansan Stage		
Glacial drift		
Sand, fine to coarse, silty and clayey	10	55
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, light gray	5	60

2-18-21ccc.—Sample log of test hole in SW cor. sec. 21, T. 2 S., R. 18 E., 75 feet north and 10 feet east of center of crossroad; augered September 21, 1960. Altitude of land surface, 1091.0 feet; depth to water, 34.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray to brown	6	6
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, silty, light gray-brown	2	8
Silt, gray brown	7	15
Clay, silty, gray	5	20
Clay, gray mottled brown	10	30
Clay, brown and tan	15	45
Clay, dark gray; contains many cobbles	15	60

2-18-26aaa.--Sample log of test hole in NE cor. sec. 26, T. 2 S., R. 18 E., in triangle 30 feet south of center of highway; augered October 18, 1960. Altitude of land surface, 1065.0 feet; depth to water, 18.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	6	6
Silt, dark brown	4	10
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray	7	17
Silt, tan brown, softer from 23 feet	13	30
Clay, tan brown, cobbles at 33 and 38 feet	11	41
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	1	42

2-18-26ddd.--Sample log of test hole in SE cor. sec. 26, T. 2 S., R. 18 E., in east ditch 400 feet north of crossroad; augered October 17, 1960. Altitude of land surface, 1120.0 feet; depth to water, 27.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	5	5
Silt, dark brown	15	20
Silt, brown	15	35
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray mottled brown, some cobbles	12	47

3-15-5ada.—Sample log of test hole in NE SE NE sec. 5, T. 3 S., R. 15 E.; augered August 22, 1960. Altitude of land surface, 1142.0 feet; depth to water, 16.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray brown	23	23
Silt, dark gray; contains much gravel	7	30
PERMIAN		
Lower Permian Series		
Council Grove Group		
Shale, gray and red brown	0.5	30.5

3-15-8dda.--Sample log of test hole in NE SE SE sec. 8, T. 3 S., R. 15 E., near tree on west road shoulder; augered August 22, 1960. Altitude of land surface, 1220.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark gray brown	3	3
Silt, gray brown	9	12
Silt, buff	3	15
PERMIAN		
Lower Permian Series		
Council Grove Group		
Beattie Limestone		
Shale, gray	2	17

3-15-12bcc.--Sample log of test hole in SW SW NW sec. 12, T. 3 S., R. 15 E., on east road shoulder 30 feet north of ½-mile line; augered August 29, 1960. Altitude of land surface, 1190.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark gray	3.5	3.5
Clay, gray and tan	5	8.5
Silt, clayey, red brown	10	18.5
Clay, tan	5	23.5
PERMIAN		
Lower Permian Series		
Council Grove Group		
Eskridge Shale		
Shale, gray	.5	24

3-15-13cbb.—Sample log of test hole in NW NW SW sec. 13, T. 3 S., R. 15 E., on east road shoulder 10 feet south of ½ mile line; augered August 29, 1960. Altitude of land surface, 1197.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark gray	3.5	3.5
Silt, clayey, light brown	5	8.5
Clay, gray brown	5	13.5
Clay, brown	5	18.5
Clay, silty, brown	5	23.5
Clay, gray; contains some fine to coarse sand and fine gravel	5	28.5
Silt, clayey, tan	5	33.5
Silt, dark brown	5	38.5
Silt, tan; contains much fine sand	5	43.5
Silt, brown	5	48.5
Clay, buff	5	53.5
PERMIAN		
Lower Permian Series		
Council Grove Group		
Grenola Limestone		
Shale, gray	0.5	54

1-15-2aaa.--Sample log of test hole in NE cor. sec. 2, T. 1 S., R. 15 E., 5 feet east of mail box on south road shoulder; augered August 23, 1960. Altitude of land surface, 1060.0 feet; depth to water, 22.6 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	5	5
Silt, dark brown	5	10
Silt, clayey, dark gray brown	10	20
PERMIAN		
Lower Permian Series		
Council Grove Group		
Red Eagle Limestone		
Shale, dark gray to black	5	25
Shale, gray	2	27
Limestone, hard, white	0.2	27.2

1-15-5add.---Sample log of test hole in SE SE NE sec. 5, T. 1 S., R. 15 E., on west road shoulder 0.1 mile north of ½ mile line; augered August 23, 1960. Altitude of land surface, 1,170.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	3	3
Lower Pleistocene-Nebraskan Stage		
Terrace deposits		
Chert gravel, silty and clayey, tan	3	6
Chert gravel, much clay, tan	2	8
Clay, gray	3	11
Clay, dark gray; contains some chert gravel	1	12
PERMIAN		
Lower Permian Series		
Council Grove Group		
Shale, gray-white	1	13

1-15-8aaa.--Sample log of test hole in NE cor. sec.8, T. 1 S., R. 15 E., on west road shoulder 50 feet south of road crossing; augered August 23, 1960. Altitude of land surface, 1213.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	6	6
Silt, light brown	12	18
Lower Pleistocene-Nebraskan Stage		
Terrace deposits		
Chert gravel, silty and clayey, tan	3	21
PERMIAN		
Lower Permian Series		
Council Grove Group		
Limestone, hard, gray white	0.2	21.2

1-15-11aad.--Sample log of test hole in SE NE NE sec. 11, T. 1 S., R. 15 E., on west road shoulder 50 feet south of bridge; augered August 23, 1960. Altitude of land surface, 995.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray brown	4	4
Silt, brown	7	11
Clay, gray; contains some gravel	1	12
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, dark gray	5	17

1-15-12ccc.--Sample log of test hole in SW cor. sec. 12, T. 1 S., R. 15 E., on east road shoulder 50 feet north of center of road crossing; augered August 23, 1960. Altitude of land surface, 974.0 feet; depth to water, 11.2 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark brown	6	6
Silt, black	6	12
Silt, brown	8	20
Silt, gray brown; contains sandy zones	15	35
Silt, gray and gravel and cobbles	2	37
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, gray	1	38

3-15-20aaa.--Sample log of test hole in NE cor. sec. 20, T. 3 S., R. 15 E., 50 feet south and 8 feet west of center of road crossing; augered August 22, 1960. Altitude of land surface, 1204.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, black	7	7
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, blayey, brown	4	11
Clay, gray and brown	2	13
Silt, clayey, red brown	2	15
PERMIAN		
Lower Permian Series		
Council Grove Group		
Beattie Limestone		
Limestone, hard, white	0.2	15.2

3-15-23daa.--Sample log of test hole in NE NE SE sec. 23, T. 3 S., R. 15 W., on west road shoulder 10 feet south of ½ mile line; augered August 30, 1960. Altitude of land surface, 1122.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan and Recent		
Stages		
Terrace deposits		
Silt, red brown	3.5	3.5
Silt, light gray; contains some fine sand	5	8.5
Clay, gray; contains some fine sand	5	13.5
Silt, gray; contains much fine to coarse sand and gravel	4	17.5
Clay, buff	2.5	20
PERMIAN		
Lower Permian Series		
Council Grove Group		
Roca Shale		
Shale, gray	1	21

3-15-25bbb.--Sample log of test hole in NW cor. sec. 25, T. 3 S., R. 15 E., on east road shoulder 200' south of crossroad; augered August 30, 1960. Altitude of land surface, 1143.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown	3.5	3.5
Silt, clayey, red brown	5	8.5
Clay, brown; contains some fine to coarse sand and gravel	5	13.5
Clay, silty; contains some fine to coarse sand and gravel	5	18.5
Silt, brown; contains fine sand	5	23.5
Clay, buff	5	28.5
PERMIAN		
Lower Permian Series		
Council Grove Group		
Johnson Shale		
Shale, gray	.5	29

3-15-29aaa.--Sample log of test hole in NE cor. sec. 29, T. 3 S., R. 15 E., 50 feet south and 10 feet west of center of road crossing; augered August 22, 1960. Altitude of land surface, 1182.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt and clay, brown, contains some gravel	7	7
Clay, gray green	2	9
Silt, red brown	2	11
Silt, brown	4	15
PERMIAN		
Lower Permian Series		
Council Grove Group		
Beattie Limestone		
Limestone and gray shale	0.2	15.2

3-15-32daa.—Sample log of test hole in NE NE SE sec. 32, T. 3 S., R. 15 E., at gate to feed lot near ½ mile line; augered August 22, 1960. Altitude of land surface, 1193.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	7	7
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray mottled brown	2	9
Silt, tan brown; contains some gravel	9	18
Clay, silty, gray; contains fine to coarse gravel	3	21
Silt, tan brown; contains much gravel and cobbles	3	24
PERMIAN		
Lower Permian Series		
Council Grove Group		
Beattie Limestone		
Limestone, hard, white	0.2	24.2

3-16-1bbb.--Sample log of test hole in NW cor. sec. 1, T. 3 S., R. 16 E., 20 feet south and 6 feet east of center of crossroad; augered September 7, 1960. Altitude of land surface, 1090.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Sand, fine to coarse; very silty, brown	3.5	3.5
Clay, silty, light brown	5	8.5
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, tan	5	13.5
Shale, greenish gray	0.5	14.0
Shale, brown	3	17.0
Shale, maroon	3	20.0

3-16-11aaa.--Sample log of test hole in NE cor. sec. 11, T. 3 S., R. 16 E., 30 feet south and 6 feet west of center of crossroad; augered September 7, 1960. Altitude of land surface, 1102.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, light brown	3.5	3.5
Silt, tan brown	5	8.5
Silt, red brown	3.5	12.0
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, greenish gray and red streaks	1.5	13.5

3-16-17aaa.--Sample log of test hole in NE cor. sec. 17, T. 3 S., R. 16 E., 30 feet west and 10 feet south of center of road crossing; augered September 1, 1960. Altitude of land surface, 1193.0 feet; depth to water, 24.3 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	7	7
Silt, red brown	6	13
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, brown	4	17
Silt, clayey, brown	6	23
Clay, tan	6	29
Clay, gray brown	9	38
Silt, brown	3	41
Silt, clayey, tan; contains fine to coarse sand and gravel and cobbles	9	50
Silt, buff; contains much fine to coarse sand	7	57
Gravel, very coarse and cobbles	3	60

3-16-21bbb.--Sample log of test hole in NW cor. sec. 21, T. 3 S., R. 16 E., in east road ditch 100 feet south of road crossing; augered September 1, 1960. Altitude of land surface, 1205.0 feet; depth to water, 19.9 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, black	3	3
Silt, brown	4	7
Silt, tan	5	12
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, red brown	13	25
Clay, gray mottled brown	10	35
Clay, light gray grading to brown	12	47
Clay, light gray	9	56
Clay, light gray and tan; contains fine to coarse sand and cobbles	4	60

3-16-21ccc.--Sample log of test hole in SW cor. sec. 21, T. 3 S., R. 16 E., 50 feet east and 6 feet north of center of crossroad; augered September 1, 1960. Altitude of land surface, 1196.0 feet; depth to water, 7.3 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray grading to brown	8	8
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray and tan	8	16
Silt, clayey, tan	5	21
Clay, gray	3	24
Clay, light gray, contains some coarse gravel	16	40
Clay, gray; contains gravel lens in lower part	10	50
Clay, red brown	8	58
Clay, gray	2	60

3-16-24bbb.--Sample log of test hole in NW cor. sec. 24, T. 3 S., R. 16 E.; augered September 7, 1960. Altitude of land surface, 1143.0 feet; depth to water, 11.5 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, light brown	3.5	3.5
Silt, tan-brown	5	8.5
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, silty, tan	5	13.5
Silt, clayey, light tan	5	18.5
Silt, sandy, tan	6.5	25.0
Sand, fine to coarse, silty, tan	3.5	28.5
Sand and gravel, fine to coarse, silty, tan	6.5	35.0
Clay, tough, gray	3.5	38.5
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, gray	0.5	39.0

3-16-25bbb.--Sample log of test hole in NW cor. sec. 25, T. 3 S., R. 16 E.; augered September 7, 1960. Altitude of land surface, 1170.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, light brown	3.5	3.5
Silt, tan	3.5	7.0
Silt, brown	10.5	17.5
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, silty, brown	5	22.5
Clay, silty, tan	7.5	30.0
Clay, gray	21.5	51.5
Silt, clayey, tan; contains much fine to coarse sand	7	58.5

3-16-29ddd.—Sample log of test hole in SE cor. sec. 29, T. 3 S., R. 16 E., 100 feet north and 8 feet west of center of crossroad; augered August 31, 1960. Altitude of land surface, 1175.0 feet; depth to water, 13.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	6	6
Lower Pleistocene-Kansan Stage		
Glacial deposits		
Clay, gray, brown	6	12
Clay, gray	5	17
Clay, light gray	13	30
Clay, light gray; contains thin lenses of gravel near bottom	12	42
PERMIAN		
Lower Permian Series		
Admire Group		
Limestone, hard	0.2	42.2

3-16-32ddd.--Sample log of test hole in SE cor. sec. 32, T. 3 S., R. 16 E., at top of hill 400 feet north and 8 feet west of center of crossroad; augered August 31, 1960. Altitude of land surface, 1155.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits	6	6
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, hard, brown	6	12
Silt, tan	4	16
Sand, fine to coarse, silty tan	2	18
PERMIAN		
Lower Permian Series		
Admire Group		
Limestone, hard	0.2	18.2

3-17-8aaa.--Sample log of test hole in NE cor. sec. 8, T. 3 S., R. 17 E., 100 feet west and 8 feet south of center of crossroad; augered October 21, 1960. Altitude of land surface, 1103.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown	6	6
Silt, clayey, light brown	8	14
Silt, clayey, dark brown	2	16
Silt, brown and much sand fine to coarse	3	19
Sand, fine to coarse and fine gravel	2	21
Silt, brown and fine to coarse sand and gravel; cobbles	2	23
Sand, red, fine to coarse	9	32
Clay, gray and fine to coarse sand and gravel; cobbles	4	36
Silt, clayey, dark brown; contains coarse gravel	6	42
Silt, sandy, dark gray to black	8	50
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, sandy, gray to tan buff	10	60

3-17-11aad.--Sample log of test hole in SE NE NE sec. 11, T. 3 S., R. 17 E., on west road shoulder 200 feet south of railroad; augered September 15, 1960. Altitude of land surface, 973.5 feet; depth to water, 11.5 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace dpposits		
Silt, dark gray brown	5	5
Silt, black to dark gray	5	10
Silt, dark brown	10	20
Silt, very soft, dark gray	27	47
Silt, dark gray, much coarse gravel and boulders	2	49
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Scranton Shale		
Shale, blue gray	1	50

3-17-11add.--Sample log of test hole in SE SE NE sec. 11, T. 3 S., R. 17 E., on west road shoulder 75 feet north of a barn; augered September 14, 1960. Altitude of land surface, 1025.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Sand and gravel, fine to coarse, silty tan	8	8
Sand and gravel fine to medium, yellow tan clay	4	12
Sand and gravel, fine to coarse, silty, tan	8	20
Silt, tan, sandy; cobbles	5	25
Clay, gray; contains fine to coarse sand and cobbles	13	38
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Bern Limestone		
Limestone, hard, blue gray	0.2	38.2

3-17-14add.---Sample log of test hole in SE SE NE sec. 14, T. 3 S., R. 17 E., on west road shoulder 300 feet south of a bridge; augered September 14, 1960. Altitude of land surface, 995.0 feet; depth to water, 17.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark brown	4	4
Silt, dark gray	9	13
Silt, dark brown	7	20
Silt, dark gray brown	15	35
Silt, dark gray	8	43
Silt, brown; much fine to coarse gravel in lenses	5	48
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Scranton Shale		
Shale, blue gray	1	49

3-17-17aaa.--Sample log of test hole in NE cor. sec. 17, T. 3 S., R. 17 E., 25 feet west and 8 feet south of center of crossroad; augered October 24, 1960. Altitude of land surface, 1073.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	5	5
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale (weathered), tan brown	5	10
Shale, silty, tan brown	10	20
Shale, gray	5	25

3-17-21bbb.--Sample log of test hole in NW cor. sec. 21, T. 3 S., R. 17 E., 25 feet east and 8 feet south of center of crossroad; augered October 24, 1960. Altitude of land surface, 1088.0 feet; depth to water, 9.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, very sandy, dark brown	3.5	3.5
Sand, fine to coarse, silty, tan	3	6.5
Clay, brown, and fine to coarse sand and gravel	2	8.5
Silt, clayey, tan; some sand, fine to coarse	5	13.5
Sand, fine, silty, tan	5	18.5
Sand, fine to coarse, silty, brown	5	23.5
Silt, brown; some fine sand	5	28.5
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	5	33.5

3-17-23aad.—Sample log of test hole in SE NE NE sec. 23, T. 3 S., R. 17 E., on west road shoulder ¼ mile south of section corner at top of hill; augered September 14, 1960. Altitude of land surface, 1085.0 feet; depth to water, 21.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown; contains fine sand	5	5
Silt, tan brown; contains fine to medium sand	6	11
Silt, dark brown, and fine to coarse sand and gravel	4	15
Silt, tan brown	1	16
Sand, fine to medium	2	18
Sand and gravel, fine to coarse and interbedded tan silt	3	21
Silt, tan; contains coarse gravel and cobbles	5	26
Sand, fine to coarse, silty, tan, some cobbles	4	30
Silt, sandy, and cobbles	11	41
Silt, clayey, and sandy	7	48
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Emporia Limestone		
Shale, gray	4	52

3-17-26aaa.--Sample log of test hole in NE cor. sec. 26, T. 3 S., R. 17 E., in center of curve of road to west; augered September 14, 1960. Altitude of land surface, 1115.0 feet; depth to water, 21.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, black	3	3
Silt, brown	4	7
Silt, gray	4	11
Silt, brown	2	13
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray and brown	3	16
Silt, brown	5	21
Clay, brown	6	27
Clay, gray	6	33
Silt, gray	5	38
Clay, silty, and fine to coarse sand and gravel	12	50
Clay, silty, and fine to coarse sand	10	60

3-17-29ddd.--Sample log of test hole in SE cor. sec. 29, T. 3 S., R. 17 E., 25 feet west and 10 feet north of center of crossroad; augered October 24, 1960. Altitude of land surface, 1109.0 feet; depth to water, 20.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray brown	3.5	3.5
Sand, fine to medium, silty, tan	2	5.5
Sand, fine	3	8.5
Silt, sandy, tan	5	13.5
Silt, brown	10	23.5
Silt, brown and fine sand	5	28.5
Silt, dark gray; contains some gravel, fine	1.5	30
Silt, brown	1.5	31.5
Silt, clayey, dark brown	2	33.5
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	5	38.5

3-17-35aaa.—Sample log of test hole in NE cor. sec. 35, T. 3 S., R. 17 E., 100 feet south and 6 feet west of center of crossroad; augered September 14, 1960. Altitude of land surface, 1136.0 feet; depth to water, 14.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray	3	3
Silt, gray brown	4	7
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, clayey, brown	4	11
Clay, tan brown	6	17
Silt, brown	6	23
Clay, gray brown; contains fine gravel	9	32
Silt and clay, interbedded, brown	4	36
Silt, brown; contains fine to coarse gravel	6	42
Clay, silty, buff; contains some fine sand	10	52
Silt, tan, and fine to coarse sand and gravel	8	60

3-17-35ddd.--Sample log of test hole in SE cor. sec. 35, T. 3 S., R. 17 E., 200 feet north and 6 feet west of center of crossroad; augered September 14, 1960. Altitude of land surface, 1138.0 feet; depth to water, 48.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray	3	3
Silt, gray brown	3	6
Silt, brown and tan	5	11
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, brown	6	17
Clay, tan brown	8	25
Silt, brown	7	32
Silt, very sandy, tan; many cobbles	13	45
Silt, tan, and interbedded fine to coarse sand and gravel	15	60

3-18-4bbb.--Sample log of test hole in NW cor. sec. 4, T. 3 S., R. 18 E., 30 feet east and 30 feet south of center of crossroad; augered September 22, 1960. Altitude of land surface, 986.0 feet:

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage (?)		
Glacial drift		
Silt, dark gray; contains fine to coarse gravel	5	5
Silt, dark gray	6	11
Gravel, fine to coarse	1	12
Silt, gray brown	5	17
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	0.2	17.2

3-18-4ccb.--Sample log of test hole in NW SW SW sec. 4, T. 3 S., R. 18 E., on section line at north side of road; augered September 26, 1960. Altitude of land surface, 954.0 feet; depth to water, 9.6 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, brown	6	6
Silt, clayey, dark gray	6	12
Clay, gray brown	1	13
Silt, brown; contains much fine sand	17	30
Silt, dark gray; contains much fine sand	23	53
Gravel, fine to coarse and much silt, dark gray	3	56
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, dark gray	1	57

3-18-9bcc.--Sample log of test hole in SW SW NW sec. 9, T. 3 S., R. 18 E., in north road ditch at east end of road curve; augered September 22, 1960. Altitude of land surface, 1035.0 feet; depth to water, 44.2 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown	10	10
Silt, light brown	7	17
Gravel, fine to coarse	0.5	17.5
Sand, fine, very silty	1.5	19
Silt, tan, and much sand and gravel, fine to coarse	6	25
Sand and gravel, fine to coarse, very silty, tan	8	33
Silt, brown	4	37
Silt, brown, and gravel, fine to coarse	6	43
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	4	47

3-18-11aaa.--Sample log of test hole in NE cor. sec. 11, T. 3 S., R. 18 E., 30 feet west and 30 feet south of center of crossroad; augered October 17, 1960. Altitude of land surface, 1051.0 feet; depth to water, 52.3 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown	16	16
Silt, tan brown, and much fine to medium sand	16	32
Sand, fine to medium and much brown silt	13	45
Sand, fine to coarse and much fine gravel	5	50
Sand, fine to coarse, silty, brown	3	53
Sand, and gravel, fine to coarse	4	57
Silt, tan, and sand, fine to coarse, some cobbles	6	63
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard, white	0.1	63.1

3-18-13ccc.--Sample log of test hole in SW cor. sec. 13, T. 3 S., R. 18 E., in north road ditch .1 mile east of section corner; augered October 7, 1960. Altitude of land surface, 1030.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	4	4
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, tan brown, and fine to coarse sand and gravel	3	7
Silt, red brown	6	13
Silt, tan brown; contains some coarse gravel	4	17
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard, gray	0.1	17.1

3-18-17aaa.--Sample log of test hole in NE cor. sec. 17, T. 3 S., R. 18 E., 75 feet west and 10 feet south of center of "T" road; augered September 22, 1960. Altitude of land surface, 970.0 feet; depth to water, 10.7 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray brown	10	10
Silt, dark brown	10	20
Silt, gray brown, very sandy, fine	10	30
Silt, sandy, gray	15	45
Silt, gray; much sand and gravel, fine to coarse	6	51
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, dark gray	2	53

3-18-23ddd.—Sample log of test hole in SE cor. sec. 23, T. 3 S., R. 18 E., in west ditch 50 feet north of crossroad; augered October 7, 1960. Altitude of land surface, 1047.0 feet; depth to water, 21.2 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	10	10
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, light brown; contains some sand, fine, and gravel from 12 to 14 feet	10	20
Clay, brown, much very fine sand	10	30
Clay, tan, and sand and gravel, fine to coarse; many cobbles	7	37
Sand, fine, silty, tan;	13	50
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	1	51

3-18-26daa.--Sample log of test hole in NE NE SE sec. 26, T. 3 S., R. 18 E., in west ditch 50 feet south of a field entrance .4 mile north of section corner; augered October 6, 1960. Altitude of land surface, 1030.0 feet; depth to water, 7.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, tan brown, and some fine to coarse sand and fine gravel	6	6
Silt, tan	2	8
Silt, buff	2	10
Clay, light brown	2	12
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, tan	2	14

3-18-28bcc.--Sample log of test hole in SW SW NW sec. 28, T. 3 S., R. 18 E., at top of a hill in highway material yard; augered September 22, 1960. Altitude of land surface, 1061.0 feet; Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, tan brown; contains much fine to coarse sand and gravel	6	6
Silt, tan brown; contains a little fine to coarse sand and gravel	2	8
Silt, tan, and coarse gravel and cobbles	5	13
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Emporia Limestone		
Limestone, hard	0.1	13.1

3-18-35daa.--Sample log of test hole in NE NE SE sec. 35, T. 3 S., R. 18 E., on west road shoulder 100 feet north of a bridge; augered October 6, 1960. Altitude of land surface, 990.0 feet; depth to water, 18.6 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray	8	8
Silt, dark brown	9	17
Silt, brown; contains some gravel, fine to coarse	6	23
Silt, gray brown	12	35
Silt, gray brown, some gravel, fine to coarse	23	58
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, dark blue gray	1	59

4-15-2add.--Sample log of test hole in SE SE NE sec. 2, T. 4 S., R. 15 E., on west road shoulder at ½ mile line; augered August 30, 1960. Altitude of land surface, 1054.0 feet; depth to water, 20.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, red brown	3.5	3.5
Silt, clayey, brown	5	8.5
Clay, silty, brown	5	13.5
Clay, brown	5	18.5
Clay, buff	5	23.5
Clay, light gray	5	28.5
PERMIAN		
Lower Permian Series		
Council Grove Group		
Foraker Limestone		
Shale, gray	0.5	29

4-15-8add.--Sample log of test hole in SE SE NE sec. 8, T. 4 S., R. 15 E., 70 feet north and 15 feet west of center of crossroad; augered August 17, 1960. Altitude of land surface, 1174.0 feet; depth to water, 31.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown grading to tan brown	7	7
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray, much brown mottling	4	11
Silt, clayey, tan; contains some gravel	3	14
Silt, clayey, tan	8	22
Silt, tan	2	24
Silt, tan brown; contains some gravel	3	27
Silt, light tan; contains much sand, fine	2	29
Silt, brown	2	31
Silt and clay, gray mottled brown	2	33
Clay, red brown	1	34
Silt, very sandy, tan; contains some gravel	1	35
PERMIAN		
Lower Permian Series		
Council Grove Group		
Grenola Limestone		
Limestone, hard, white	0.5	35.5

4-15-13ccc.--Sample log of test hole in SW cor. sec. 13, T. 4 S., R. 15 E., on east road shoulder 50 feet north of road crossing; augered August 26, 1960. Altitude of land surface, 1040.0 feet; Depth to water, 8.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray and brown	6	6
Silt, clayey, brown	6	12
Clay, red brown	4	16
Silt, clayey, brown	7	23
Silt, brown; contains much gravel and boulders	5	28
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, gray and dark gray	2	30

4-15-17ddd.--Sample log of test hole in SE cor. sec. 17, T. 4 S., R. 15 E., 10 feet west and 50 feet north of center of road crossing; augered August 17, 1960. Altitude of land surface, 1137.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown grading to tan; contains some fine to coarse sand	5	5
Silt, tan; contains gravel and caliche	3	8
Silt, tan; contains some gravel, fine to coarse	16	24
PERMIAN		
Lower Permian Series		
Council Grove Group		
Limestone, hard, white	0.2	24.2

4-15-26ada.--Sample log of test hole in NE SE NE sec. 26, T. 4 S., R. 15 E.,0.3 mile south of section corner in field near large elm tree; augered August 26, 1960. Altitude of land surface, 1100.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, red brown; contains fine to coarse sand and gravel	6	6
Clay, tan and gray	5	11
Sand, very fine, silty, red	3	14
Silt, brown; contains sand and gravel, fine to coarse	2	16
Sand and gravel, fine to coarse; much silt, brown	2	18
Silt, brown; contains some fine to coarse sand and gravel	3	21
Silt, and clay, tan brown	3	24
Clay, silty, tan brown	11	35
Silt, clayey, dark gray; contains some gravel	15	50
Clay, silty, gray	10	60

4-15-26ddd.--Sample log of test hole in SE cor. sec. 26, T. 1 S., R. 15 E., 50 feet north and 6 feet east of center of crossroad; augered August 31, 1960. Altitude of land surface, 1054.0 feet; depth to water, 7.5 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, sandy, brown	4	4
Silt, dark brown	3	7
Silt, brown	5	12
Silt, tan	3	15
Silt, clayey, dark brown	1	16
Silt, sandy, tan	14	30
Clay, gray	15	45
Clay, gray; contains fine to coarse sand and gravel and cobbles	5	50
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, dark gray	7	57

4-15-29aaa.--Sample log of test hole in NE cor. sec. 29, T. 4 S., R. 15 E., 200 feet south of road crossing on west road shoulder; augered August 16, 1960. Altitude of land surface, 1110.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt and clay, gray brown; contains some gravel	24	24
Silt and clay, dark gray; contains cobbles	10	34
PERMIAN		
Lower Permian Series		
Council Grove Group		
Limestone, soft, white	0.5	34.5

4-15-29ddd.--Sample log of test hole in SE cor. sec. 29, T. 4 S., R. 15 E., 50 feet north and 15 feet west of center of crossroad; augered August 16, 1960. Altitude of land surface, 1154.5 feet; depth to water, 14.3 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, gray brown	6	6
Silt, gray mottled brown; contains some fine sand	9	15
Silt, gray and brown; contains some gravel	4	19
Silt, tan; contains fine to medium sand	4	23
Silt and clay, gray and brown; contains sand, gravel, and cobbles	20	43
Clay, sandy, dark gray to black	10	53
Clay, dark gray; contains some gravel	7	60

4-15-33bcc.--Sample log of test hole in SW SW NW sec. 33, T. 4 S., R. 15 E., 12 feet east and 30 feet north of center of road crossing; augered August 16, 1960. Altitude of land surface, 1151.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, reddish brown	10	10
Silt, sandy, brown	5	15
Silt, reddish tan	15	30
Silt, tan; contains some gravel	9	39
Clay, light to dark gray; contains some gravel and cobbles	21	60

4-15-36ccc.--Sample log of test hole in SW cor. sec. 36, T. 4 S., R. 15 E., 150' north and 8 feet east of center of crossroad; augered August 31, 1960. Altitude of land surface, 1129.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark gray and brown	3	3
Silt, brown; contains sand and gravel, fine to coarse	5	8
Clay, silty, tan; contains fine to coarse sand and gravel	5	13
Silt, tan	5	18
Gravel, fine to coarse	4	22
PERMIAN		
Lower Permian Series		
Council Grove Group		
Foraker Limestone		
Limestone, hard, gray	0.2	22.2

4-16-1bbb.--Sample log of test hole in NW cor. sec. 1, T. 4 S., R. 16 E., 50 feet south and 8 feet east of center of crossroad; augered September 12, 1960. Altitude of land surface, 1121.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, tan brown; contains some coarse gravel	6	6
Clay, brown	7	13
Clay, silty, light brown	3	16
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, weathered, dark blue gray	2	18
Shale, soft, brown	2	20

4-16-1ccc.--Sample log of test hole in SW cor. sec. 1, T. 4 S., R. 16 E., on north road shoulder 200 feet east of a bridge; augered September 12, 1960. Altitude of land surface, 1070.0 feet; depth to water, 26.6 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray to black	7	7
Silt, dark gray brown	8	15
Clay, gray brown	6	21
Silt, brown	6	27
Silt, red brown	4	31
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, soft, blue gray	2	33
Shale, hard, gray	12	45

4-16-9bbb.--Sample log of test hole in NW cor. sec. 9, T. 4 S., R. 16 E., 100 feet south and 30 feet east of center of crossroad; augered August 31, 1960. Altitude of land surface, 1160.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	11	11
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, tough, tan gray	6	17
Silt, tan; contains some fine to coarse gravel	2	19
Silt, light brown; contains some fine to coarse gravel	3	22
Silt, tan; contains some fine gravel and cobbles	9	31
Sand, fine to coarse, clayey and silty	2	33
Clay, brown; contains some coarse gravel	5	38
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, gray brown	7	45

4-16-13ccc.--Sample log of test hole in SW cor. sec. 13, T. 4 S., R. 16 E., 50 feet east and 10 feet north of center of crossroad; augered September 12, 1960. Altitude of land surface, 1139.0 feet; depth to water, 36.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray grading to brown	4	4
Silt, tan brown	4	8
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, tan brown grading to gray	12	20
Clay, gray; contains coarse gravel; boulders at 27 feet	8	28
Silt, tan brown and gray brown; contains some fine to coarse gravel	4	32
Silt, buff; contains much fine gravel	2	34
PERMIAN		
Lower Permian Series		
Admire Group		
Onaga Shale		
Shale, gray and reddish brown	4	38

4-16-17daa.--Sample log of test hole in NE NE SE sec. 17, T. 4 S., R. 16 E., on west road shoulder 30 feet north of bridge; augered August 31, 1960. Altitude of land surface, 1043.0 feet; depth to water, 13.50 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, black	10	10
Silt, sandy, dark gray	10	20
Silt, dark gray to brown; contains lenses of fine to coarse sand and gravel and some cobbles	15	35
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale (clay), tough	20	55

4-16-20add.--Sample log of test hole in SE SE NE sec. 20, T. 4 S., R. 16 E., in west road ditch 50 feet north of ½ mile line; augered August 31, 1960. Altitude of land surface, 1129.0 feet; depth to water, 11.00 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown; contains some fine to coarse sand and gravel	7	7
Silt, tan; contains fine to coarse sand and gravel	2	9
Silt, tan	3	12
Sand, fine to medium, silty	1	13
Sand and gravel, fine to coarse; contains much tan silt and clay	4	17
PERMIAN		
Lower Permian Series		
Admire Group		
Limestone, hard	0.2	17.2

4-16-26aaa.--Sample log of test hole in NE cor. sec. 26, T. 4 S., R. 16 E., in driveway leading west to lake; augered September 12, 1960. Altitude of land surface, 1089.0 feet; depth to water, 18.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt and clay, dark brown	5	5
Silt, clayey, brown	3	8
Silt, dark brown and fine to medium sand and gravel	4	12
Silt, brown	4	16
Silt, clayey, brown and tan; contains fine gravel	1	17
Silt, black	1	18
Silt, dark brown	4	22
Clay, silty brown	2	24
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Wood Siding Formation		
Shale, clayey, hard, dark gray	1	25

4-16-26caa.--Sample log of test hole in NE NE SW sec. 26, T. 4 S., R. 16 E., 10' west and 6' south of center of road at center of section; augered August 15, 1960. Altitude of land surface, 1126.0 feet; depth to water, 22.3 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, black grading to brown	3	3
Silt, tan	5	8
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray mottled brown	4	12
Silt, buff; contains some gravel	8	20
Clay, gray mottled tan brown	5	25
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Wood Siding Formation		
Limestone, hard, white	0.2	25.2

4-16-26cbb.---Sample log of test hole in NW NW SW sec. 26, T. 4 S., R. 16 E., 35 feet east and 6 feet south of center of road at ½ mile line; augered August 15, 1960. Altitude of land surface, 1138.1 feet; depth to water, 16.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt brown	6	6
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray, some brown mottling	5	11
Clay, gray; contains caliche	5	16
Sand, very fine, clayey and silty tan	2	18
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Wood Siding Formation		
Limestone, hard, white	0.2	18.2

4-16-26ddd.--Sample log of test hole in SE cor. sec. 26, T. 4 S., R. 16 E., 50 feet north and 6 feet west of center of crossroad; augered August 15, 1960. Altitude of land surface, 1106.7 feet; depth to water, 15.4 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	8	8
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, tan brown, some fine to coarse gravel	10	18
Sand, fine to coarse, very silty, tan	5	23
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Wood Siding Formation		
Limestone, hard, white	0.2	23.2

4-16-29aad.--Sample log of test hole in SE NE NE sec. 29, T. 4 S., R. 16 E., on west road shoulder 20 feet north of drive; augered August 31, 1960. Altitude of land surface, 1112.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	7	7
Silt, tan brown	2	9
Silt, tan to buff	2	11
Silt, brown	2	13
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt brown; contains some sand and gravel	4	17
Clay, light gray; contains fine gravel	5	22
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, dark gray	3	25
Limestone, hard, white	0.2	25.2

4-16-30ccc.--Sample log of test hole in SW cor. sec. 30, T. 4 S., R. 16 E., 150 feet north and 8 feet east of center of crossroad; augered August 31, 1960. Altitude of land surface, 1129.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, red brown; much fine to coarse sand and gravel	6	6
Silt, hard, compact, tan	2	8
Sand, silty, fine to coarse	4	12
Sand and gravel, fine to coarse, silty, tan brown	2	14
Silt, tan	11	25

4-16-31ddd.--Sample log of test hole in SE cor. sec. 31, T. 4 S., R. 16 E., 30 feet west and 10 feet north of center of crossroad; drilled November 29, 1948. Altitude of land surface, 1124.1 feet; depth to water, 11.58 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt and clay, compact, light brown	4	4
Clay, reddish tan	4	8
Clay, light tan; some caliche pebbles	9	17
Clay, light tan; some caliche and fine to coarse gravel	10	27
Clay, sandy, light tan	5	32
Gravel, fine to coarse	5	37
Clay, tan, and fine to coarse gravel	3	40
Sand, fine to medium; some tan clay	10	50
Clay, tan	18	68
PERMIAN		
Lower Permian Series		
Admire Group		
Shale, red	8	76
Limestone, light tan	1	77

4-16-33bbb.--Sample log of test hole in NW cor. sec. 33, T. 4 S., R. 16 E., 500 feet south of sec. corner on east road shoulder; augered August 31, 1960. Altitude of land surface, 1012.0 feet; depth to water, 8.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray brown	7	7
Silt, brown	13	20
Silt, very soft, gray brown	10	30
Silt, brown; contains some gravel	8	38
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, hard, gray	0.5	38.5

4-16-34baa.—Sample log of test hole in NE NE NW sec. 34, T. 4 S., R. 16 E., 0.4 mile east of section corner in south ditch near gate; augered August 16, 1960. Altitude of land surface, 1123.0 feet; Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, sandy and clayey, red brown	8	8
Clay, silty, tan	3	11
Silt, buff	9	20
PERMIAN		
Lower Permian Series		
Admire Group		
Onaga Shale		
Shale, gray and red	5	25

4-16-34ccd.--Sample log of test hole in SE SW SW sec. 34, T. 4 S., R. 16 E., 50 feet west of bridge on north road shoulder; augered August 16, 1960. Altitude of land surface, 1120.0 feet; depth to water, 13.4 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan and Recent Stages		
Valley deposits		
Silt, black to dark brown	5	5
Silt, dark brown	5	10
Silt, brown; contains some coarse sand	7	17
Silt, fine sandy; contains some coarse sand and gravel	11	28
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Root Shale		
Shale, gray	0.5	28.5

4-16-35abb.--Sample log of test hole in NW NW NE sec. 35, T. 4 S., R. 16 E., in south road ditch at ½ mile line; augered August 16, 1960. Altitude of land surface, 1120.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	3	3
Silt, tan brown	2	5
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray mottled brown	8	13
Silt, reddish tan; contains much imbedded gravel	3	16
Silt, very sandy, tan	3	19
PERMIAN		
Lower Permian Series		
Admire Group		
Onaga Shale		
Shale, tan, weathered	2	21
Shale, gray	4	25

4-16-35cbb.—Sample log of test hole in NW NW SW sec. 35, T. 4 S., R. 16 E., 10 feet south and 6 feet east of center of road at ½ mile line; augered August 15, 1960. Altitude of land surface, 1134.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, reddish brown; contains some imbedded sand	7	7
Silt, tan; clayey in upper part	6	13
Silt, tan, clayey; contains some gravel and pebbles	4	17
PERMIAN		
Lower Permian Series		
Admire Group		
Onaga Shale		
Shale, gray	0.2	17.2

4-16-35ccc.--Sample log of test hole in SW cor. sec. 35, T. 4 S., R. 16 E., 30 feet north and 30 feet east of center of crossroad; augered August 16, 1960. Altitude of land surface, 1107.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, clayey, gray	6	6
PERMIAN		
Lower Permian Series		
Admire Group		
Onaga Shale		
Shale, gray	0.3	6.3

4-16-35cdd.--Sample log of test hole in SE SE SW sec. 35, T. 4 S., R. 16 E., on north road shoulder .35 mile east of section corner; drilled November 29, 1948. Altitude of land surface, 1125.8 feet; depth to water, 11.25 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, black	3	3
Silt, soft, black	2	5
Clay, tan to dark gray; contains some fine sand and caliche	4	9
Sand, medium to coarse, and some fine gravel	6	15
Clay, tan; contains some fine to coarse sand and gravel	2	17
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Wood Siding Formation (Brownville Limestone)		
Limestone, hard, light tan	3	20

4-16-35daa.--Sample log of test hole in NE NE SE sec. 35, T. 4 S., R. 16 E., 8 feet west and 3 feet south of center of road at ½ mile line; augered August 15, 1960. Altitude of land surface, 1135.5 feet; depth to water, 34.3 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, buff gray	4	4
Silt, gray	8	12
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray mottled brown	8	20
Clay, gray	10	30
Silt, brown, grading to tan, some coarse gravel	10	40
Silt, tan, sandy	8	48
PERMIAN		
Lower Permian Series		
Admire Group		
Onaga Shale		
Towle Shale		
Shale, gray	.2	48.2

4-17-2ddd.--Sample log of test hole in SE cor. sec. 2, T. 4 S., R. 17 E., 75 feet north and 8 feet west of center of crossroad; augered September 14, 1960. Altitude of land surface, 1151.0 feet; depth to water, 44.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown and buff	6	6
Silt, clayey, red brown	2	8
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, dark brown	5	13
Clay, gray, mottled brown	8	21
Silt, clayey, gray	6	27
Clay, gray	11	38
Silt, brown	3	41
Silt, red brown; contains much fine gravel	4	45
Silt, tan	2	47
Sand and gravel, fine to coarse, very silty; cobbles in lower part	13	60

4-17-4bbb.--Sample log of test hole in NW cor. sec. 4, T. 4 S., R. 17 E.; augered September 9, 1960. Altitude of land surface, 1145.0 feet; depth to water, 10.7 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	8.5	8.5
Silt, red brown	4.5	13.0
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, silty, brown	12	25.0
Clay, silty, yellow-brown	5.5	30.5
Sand, fine to coarse, silty, tan	1.5	32.0
Silt, sandy, very dark blue gray	1	33.0
Silt, sandy, tan	22	55.0
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray brown	0.5	55.5

4-17-8aaa.--Sample log of test hole in NE cor. sec. 8, T. 4 S., R. 17 E., across road from a tree 50 feet west of center of highway; augered September 9, 1960. Altitude of land surface, 1170.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	7	7
Silt, red brown	1	8
Silt, brown	8	16
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, siltv, light brown	17.5	33.5
Clay, tan	12.5	46.0
Silt, sandy, red brown	2	48.0
Silt, very sandy, tan brown	3	51.0
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Root Shale		
Shale, dark gray brown	0.5	51.5

4-17-9ccc.—Sample log of test hole in SW cor. sec. 9, T. 4 S., R. 17 E., 8 feet west of bridge; augered September 9, 1960. Altitude of land surface, 1144.0 feet; depth to water, 18.5 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	3.5	3.5
Silt, light brown	3.5	7.0
Silt, red brown	2	9.0
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, silty, brown	8.5	17.5
Clay, silty, red brown	12.5	30.0
Clay, gray and tan	7.5	37.5
Silt, sandy and clayey brown	8	45.5
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Root Shale		
Shale, blue gray	3	48.5

4-17-14aaa.--Sample log of test hole in NE cor. sec. 14, T. 4 S., R. 17 E., 50 feet south and 6 feet west of center of crossroad; augered September 13, 1960. Altitude of land surface, 1158.0 feet; depth to water, 14.3 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	8	8
Silt, gray brown	12	20
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray mottled brown	10	30
Clay, gray and brown; contains streaks of fine to coarse gravel	10	40
Clay, gray	10	50
Clay, gray; contains gravel streaks	10	60

4-17-14dda.--Sample log of test hole in NE SE SE sec. 14, T. 4 S., R. 17 E., on west road shoulder 100 feet south of a bridge; augered September 13, 1960. Altitude of land surface, 1089.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, black	3	3
Silt, brown	5	8
Silt, clayey; contains fine to coarse gravel	4	12
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Willard Shale		
Shale, gray, brown	2	14
Shale, gray	1	15

4-17-24dcd.—Sample log of test hole in SE SW SE sec. 24, T. 4 S., R. 17 E., on north road shoulder at a gate; augered October 26, 1960. Altitude of land surface, 1090.0 feet; depth to water, 27.6 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark gray	3	3
Silt, clayey, dark brown	7	10
Clay, gray brown	6	16
Silt, tan, and fine to medium sand; some fine gravel	5	21
Silt, tan, and very fine to fine sand	2	23
Sand, fine to very fine	4	27
Silt, clayey, tan brown, and some fine to medium sand	13	40
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Emporia Limestone		
Limestone, hard, blue gray	0.2	40.2

4-17-26ddc.--Sample log of test hole in SW SE SE sec. 26, T. 4 S., R. 17 E., in west road ditch 150 feet north of center of highway; augered September 13, 1960. Altitude of land surface, 1039.0 feet; depth to water, 17.9 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray	6	6
Silt, brown	9	15
Silt, light brown	7	22
Silt, gray brown; much fine to medium sand and gravel	2	24
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Auburn Shale		
Shale, hard, blue gray	3	27

4-17-28cbb.--Sample log of test hole in NW NW SW sec. 28, T. 4 S., R. 17 E., at north city limits of Horton 600 feet south of ½ mile line on east road shoulder; augered September 30, 1960. Altitude of land surface, 1087.0 feet; depth to water, 6.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown	6	6
Silt, tan brown	4	10
Sand, fine to medium and much tan silt	5	15
Silt and clay, sandy, tan brown	3	18
Sand, fine to coarse and interbedded tan silt	8	26
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	2	28

4-17-29aaa.--Sample log of test hole in NE cor. sec. 29, T. 4 S., R. 17 E., 30 feet south and 20 feet west of center of crossroad; augered September 9, 1960. Altitude of land surface, 1106.0 feet; depth to water, 20.2 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	3.5	3.5
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, very sandy, light red brown	7	10.5
Silt, brown	6	16.5
Silt, clayey, yellow brown	3	19.5
Clay, light yellow brown, contains gravel	1.5	21
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Root Shale		
Shale, gray	0.5	21.5

4-17-35ddd.--Sample log of test hole in SE cor. sec. 35, T. 4 S., R. 17 E., 10 feet north and 20 feet west of center of "T" road; augered September 13, 1960. Altitude of land surface, 1115.0 feet; depth to water, 32.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian deposits		
Silt, dark gray to gray brown	6	6
Silt, brown	5	11
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray	15	26
Silt, clayey, gray brown	3	29
Silt, red brown	3	32
Silt, very clayey, brown	13	45
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Willard Shale		
Shale, hard, reddish gray	2	47

4-18-2ada.—Sample log of test hole in NE SE NE sec. 2, T. 4 S., R. 18 E., on west road shoulder at top of a hill 300 feet north of a house; augered October 6, 1960. Altitude of land surface, 1069.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, black	3	3
Silt, hard, brown	5	8
Silt, red brown; contains some fine to coarse sand and gravel	5	13
Silt, tan brown	3	16
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Bern Limestone		
Shale, gray	2	18
Limestone, blue gray	0.2	18.2

4-18-2ddd.--Sample log of test hole in SE cor. sec. 2, T. 4 S., R. 18 E., in west ditch at top of a hill 150 feet north of crossroad; augered October 6, 1960. Altitude of land surface, 1101.0 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	8	8
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown, and fine to coarse sand and gravel	9	17
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	2	19

4-18-5aaa.—Sample log of test hole in NE cor. sec. 5, T. 4 S., R. 18 E., 50 feet west and 6 feet south of center of crossroad; augered September 22, 1960. Altitude of land surface, 1093.5 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	10	10
Silt, red brown	5	15
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, tan, much fine sand	8	23
Silt, brown	1	24
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Willard Shale		
Shale, gray green	1	25

4-18-9ccc.--Sample log of test hole in SW cor. sec. 9, T. 4 S., R. 13 E., 75 feet east and 8 feet north of center of crossroad; augered September 25, 1960. Altitude of land surface, 1114.0 feet; depth to water, 23.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark gray grading to dark brown	5	5
Silt, brown	8	13
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray	3	16
Silt, brown; contains some fine to coarse sand and gravel	2	18
Silt, tan, and fine to coarse sand and gravel	4	22
Gravel, very coarse, and cobbles	0.5	22.5
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Willard Shale		
Shale, dark gray	4.5	27

4-18-14ddd.--Sample log of test hole in SE cor. sec. 14, T. 4 S., R. 18 E., in west road ditch 50 feet north of center of crossroad; augered October 6, 1960. Altitude of land surface, 1135.0 feet; depth to water, 26.7 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	3	3
Silt, reddish brown	4	7
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, dark gray brown	12	19
Clay, gray	3	22
Silt, clayey, gray brown; contains some fine to coarse gravel	13	35
Clay, gray; some sand, fine, and cobbles	15	50
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, dark gray	10	60

4-18-17ddd.--Sample log of test hole in SE cor. sec. 17, T. 4 S., R. 18 E., 35 feet west and 6 feet north of center of crossroad; augered September 26, 1960. Altitude of land surface, 1107.5 feet. Dry hole.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	5	5
Silt, dark brown	6	11
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray	4	15
Silt, compact, red brown	6	21
Silt, tan, and fine to coarse sand and gravel	8	29
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Emporia Limestone		
Limestone, hard	0.1	29.1

4-18-19bbb.—Sample log of test hole in NW cor. sec. 19, T. 4 S., R. 18 E., 200 feet east and 8 feet south of center of crossroad; augered October 26, 1960. Altitude of land surface, 1101.0 feet; depth to water, 19.6 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark gray	5	5
Silt, dark brown; contains some very fine sand	7	12
Clay, gray and brown	4	16
Clay, silty, tan brown, and interbedded fine to coarse sand and gravel	2	18
Silt, clayey, tan brown	4	22
Silt, tan, and much sand, fine to coarse, and fine to coarse gravel and cobbles from 22-23 feet	15	37
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard, blue gray	0.2	37.2

4-18-19ccd.--Sample log of test hole in SE SW SW sec. 19, T. 4 S., R. 18 E., 600 feet east of section corner on north road shoulder; augered October 26, 1960. Altitude of land surface, 1123.0 feet; depth to water, 43.00 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark brown	5	5
Silt, brown	3	8
Clay, brown	4	12
Clay, gray brown	5	17
Silt, clayey, brown	6	23
Clay, gray brown	4	27
Silt, clayey, gray brown, and some fine to coarse gravel	3	30
Silt, tan brown, and much fine to medium sand	2	32
Sand, fine to medium, and much gray brown silt	8	40
Sand, fine to coarse, silty, tan	17	57
Gravel, coarse, and cobbles	5	62
Silt, tan	1	63
Sand and gravel, fine to coarse, and cobbles	3	66

4-18-19ccd.-- (continued)

	Thickness, feet	Depth, feet
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	3	69

4-18-19ddd.--Sample log of test hole in SE cor. sec. 19, T. 4 S., R. 18 E., on north road shoulder 200 feet west of crossroad; augered October 26, 1960. Altitude of land surface, 1139.0 feet; depth to water, 41.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower		
Pleistocene-Kansan Stage		
Glacial drift		
Silt, dark brown	10	10
Clay, gray brown	6	16
Clay, gray	5	21
Silt and clay, interbedded, gray and gray brown	5	66
Clay, light gray	7	33
Silt, clayey, tan; some fine sand	7	40
Silt and much clay, tan gray; contains much fine sand	8	48
Clay and silt, tan; contains some fine to coarse sand and gravel	4	52
Sand and gravel, fine to coarse, and much tan gray silt and clay	8	60

4-18-23addl.--Sample log of test hole in SE SE NE sec. 23, T. 4 S., R. 10 E., in west road ditch where road curves to north; augered October 6, 1960. Altitude of land surface, 1063.0 feet; depth to water, 9.7 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Terrace deposits		
Silt, dark gray, and some fine sand	5	5
Silt, brown	7	12
Silt, dark gray; some very fine sand	4	16
Silt, dark gray; much fine to medium sand	11	27
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, very dark gray	5	32

4-18-23add2.—Sample log of test hole in SE SE NE sec. 23, T. 4 S., R. 18 E., in west road ditch opposite sand pit; augered October 6, 1960. Altitude of land surface, 1075.0 feet; depth to water, 14.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, brown, and fine to coarse sand and gravel	5	5
Sand and gravel, fine to coarse, silty brown	8	13
Sand and gravel, fine to coarse; much silt, tan brown	2	15
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, very "limy," dark gray	2	17

4-18-26dad.—Sample log of test hole in SE NE SE sec. 26, T. 4 S., R. 18 E., on west road shoulder at drive to house .4 mile north of section corner; augered October 5, 1960. Altitude of land surface, 1145.0 feet; depth to water, 27.5 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, brown	5	5
Silt, tan brown	7	12
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, gray and brown	5	17
Silt, clayey, brown	4	21
Clay, gray	3	24
Silt, brown	6	30
Silt, tan brown, and much fine to medium sand; some cobbles	15	45
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, gray	1	46

4-18-31ccc.--Sample log of test hole in SW cor. sec. 31, T. 4 S., R. 18 E., 75 feet east and 10 feet north of center of crossroad; augered October 25, 1960. Altitude of land surface, 1119.0 feet; depth to water, 49.0 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, black	5	5
Silt, dark brown	2	7
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, very clayey, tan gray	5	12
Clay, light brown	5	17
Clay, gray; contains some fine to coarse gravel	10	27
Silt, dark brown; contains some very fine to fine sand	9	36
Silt, tan brown, and much very fine to fine sand	4	40
Silt, clayey, brown; contains some fine to coarse sand and gravel	10	50
Silt, brown, and fine to coarse sand and gravel	10	60

4-18-31dcd.--Sample log of test hole in SE SW SE sec. 31, T. 4 S., R. 18 E., 600 feet east of ½ mile line and on north road shoulder; augered October 25, 1960. Altitude of land surface, 1090.0 feet; depth to water, 21.9 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, clayey, tan brown	6	6
Silt, light brown	10	16
Silt, tan, and fine to medium sand	5	21
Sand, fine to coarse, silty, tan; contains some fine gravel	5	26
Silt, sandy, brown	1	27
Clay, dark brown, and interbedded fine to coarse sand and gravel	11	38
Sand, fine to coarse, silty, tan	5	43
Sand and gravel, fine to coarse, cemented, hard	3	46
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, blue gray	9	55

4-18-32aaa.--Sample log of test hole in NE cor. sec. 32, T. 4 S., R. 18 E., in west ditch 150 feet south of crossroad; augered September 26, 1960. Altitude of land surface, 1155.0 feet; depth to water, 21.8 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, dark brown	6	6
Silt, light brown	5	11
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, tough, gray brown	6	17
Silt, clayey, gray brown	6	23
Clay, brown; contains some fine gravel	7	30
Clay, gray; contains some fine to coarse gravel	15	45
Silt, light gray, and clay, light gray, and interbedded fine to coarse sand and gravel	15	60

4-18-32ddd.--Sample log of test hole in SE cor. sec. 32, T. 4 S., R. 18 E., 75 feet west and 10 feet north of center of crossroad; augered September 26, 1960. Altitude of land surface, 1111.0 feet; depth to water, 10.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, clayey, black	6	6
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, clayey, brown, and fine sand	6	12
Silt, clayey, light gray	4	16
Clay, gray	2	18
Clay, tan, and fine to coarse sand and gravel	1.5	19.5
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, hard, gray white	0.1	19.6

5-17-2abb.--Sample log of test hole in NW NW NE sec. 2, T. 5 S., R. 17 E., Atchison County, on south road shoulder .45 mile west of section corner; drilled November 3, 1948. Altitude of land surface, 1107.4 feet; depth to water, 17.2 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Lower Pleistocene-Kansan Stage		
Glacial drift		
Silt, black	2	2
Silt and clay, dark gray to light tan	5	7
Clay, light gray	10.5	17.5
Clay, tan, and some fine to coarse gravel	12.5	30
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Zeandale Limestone (Tarkio Limestone)		
Limestone, soft, tan	1	31
Clay, clayey, greenish gray	2	33
Limestone, tan	1.5	34.5
Shale, sandy, greenish tan	1	35.5
Limestone, soft, yellowish gray	2.5	38
Willard Shale		
Shale, greenish tan	1	39
Shale, greenish blue, coal seam	4	43
Shale, sandy, greenish blue	7	50

5-18-2aab.--Sample log of test hole in NW NE NE sec. 2, T. 5 S., R. 18 E., Atchison County, on south road shoulder .15 mile west of section corner; drilled November 3, 1948. Altitude of land surface, 1170.0 feet; depth to water, 9.4 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, clayey, light gray; some iron staining	10	10
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, very compact, reddish tan	20	30
Clay, compact, light gray	20	50
Clay, light gray and zones of fine to coarse sand and gravel	11	61
Clay, tan, and fine to medium gravel	29	90
Clay, tan and gray; some fine to coarse gravel	6	96
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Shale, blue, some sand	4	100

5-18-5bba.—Sample log of test hole in NE NW NW sec. 5, T. 5 S., R. 18 E., Atchison County, on south road shoulder .2 mile east of section corner; drilled November 3, 1948. Altitude of land surface, 1137.2 feet; depth to water, 7.1 feet.

	Thickness, feet	Depth, feet
NEOGENE		
Pleistocene		
Upper Pleistocene-Wisconsinan Stage		
Eolian silt deposits		
Silt, black	1.5	1.5
Clay, silty, tan and tan gray	5.5	7
Lower Pleistocene-Kansan Stage		
Glacial drift		
Clay, compact, reddish gray	4	11
Clay, compact, gray	23.5	34.5
Clay, gray, and fine to coarse sand and gravel	6.5	41
Clay, dark gray and tan; contains much limestone gravel	7	48
Clay, tan; and limestone gravel	9	57
Clay, very dark gray to black; contains some fine to coarse gravel	5.5	62.5
Clay, tan to buff, and much fine to coarse gravel	4.5	67
PENNSYLVANIAN		
Upper Pennsylvanian Series		
Wabaunsee Group		
Limestone, light tan and gray	3	70